Corresponding authors' address:

[1,2,3] Didáctica de la Educación Física, Artística y Música. Facultad de Educación. Universidad de Castilla-La Mancha. Plaza de la Universidad, 3 - Edificio Simón Abril, 02071, Albacete (Spain)

[4] Departamento de Didáctica de la Expresión Musical, Plástica y Corporal. Facultad de Educación. Universidad de Castilla La-Mancha. Avda. de Carlos III, 45004, Toledo (Spain)

E-mail / ORCID

Raquel.Bravo@uclm.es

https://orcid.org/0000-0001-5809-7739

narcisojose.lopez@uclm.es

https://orcid.org/0000-0002-5665-5263

fatima.martin@uclm.es

https://orcid.org/0009-0008-1839-2395

mjose.sanchez@uclm.es

https://orcid.org/0000-0003-2161-2746

ARTICLE / ARTÍCULO

Impact of the Digital Teaching Competence Training Plan on Music Specialists in Castilla-La Mancha

Impacto del Plan de Formación en Competencia Digital Docente en los especialistas de Música de Castilla-La Mancha

Raquel Bravo-Marín[1], Narciso José López-García[2], Fátima Martín-Ruiz[3] & María José Sánchez-Parra[4]

Abstract: The Regional Ministry of Education, Culture and Sports of Castilla-La Mancha implemented, during the school years 2021-2022 and 2022-2023, the so-called Educational Digitalization Plan, to reduce the digital divide of students, renew and expand the technological endowments of public schools and improve the digital competence of the educational community. One of its key pillars has been teacher training in Digital Competence (CDD), trying to provide B1 level to Primary and Secondary teachers in the region, in line with the CDD Reference Framework proposed by the National Institute of Educational Technologies and Teacher Training (INTEF). The aim of this research is to find out the perception of music teachers specializing in Primary and Secondary Education in Castilla-La Mancha about the development of this training and their degree of satisfaction once it has been completed. For this purpose, an ad hoc questionnaire was designed to collect a series of data, enabling an assessment of the outcomes of this regional plan. Finally, the most important conclusions derived from the study are presented and possible avenues of research that could enrich the results obtained on the training process in CDD from Music Education are suggested.

Keywords: Educational Tecnology, Music Education, Primary Education, Secondary Education, Teacher Education, Teacher Digital Competence.

Resumen: La Consejería de Educación, Cultura y Deportes de Castilla-La Mancha puso en marcha, durante los cursos escolares 2021-2022 y 2022-2023, el denominado Plan de Digitalización Educativa, para reducir la brecha digital del alumnado, renovar y ampliar las dotaciones tecnológicas de los centros públicos y mejorar la competencia digital de la comunidad educativa. Uno de sus pilares fundamentales ha sido la formación docente en Competencia Digital (CDD), intentando dotar del nivel B1 al profesorado de Primaria y Secundaria de la región, en consonancia con el Marco de Referencia de la CDD propuesto por el Instituto Nacional de Tecnologías Educativas y de Formación del Profesorado (INTEF). Esta investigación pretende dar a conocer la percepción de los docentes especialistas de Música de Educación Primaria y Educación Secundaria castellanomanchegos sobre el desarrollo de esta formación y su grado de satisfacción una vez finalizada. Para ello, se diseñó un cuestionario ad hoc con el que se ha recogido una serie de datos que han permitido conocer el resultado de este plan regional. Finalmente, se presentan las conclusiones más importantes derivadas del estudio y se exponen posibles vías de investigación que podrían enriquecer los resultados obtenidos sobre el proceso de formación en CDD desde la Educación Musical.

Palabras-clave: Tecnología Educativa, Educación Musical, Educación Primaria, Enseñanza Secundaria, Formación del Profesorado, Competencia Digital Docente.

1. Introduction

The use of technological devices in everyday tasks has made it essential to incorporate digital literacy into daily life (Fuentes & López, 2018). In fact, the impact of information and communication technology (ICT) on society has happened at such a pace that it has generated significant changes in our perception of space and time, enabling the distribution of content to a wide audience regardless of geographic location.

In the educational sphere, ICT is facilitating knowledge transfer, self-directed learning and comprehension (Khan & Markauskaite, 2017), while also fostering the development of new skills and competences that enable students to expand the knowledge acquired in the classroom.

This has led teachers to undertake training and adapt to this reality, one in which the new methodological approach has highlighted the need to effectively develop the tools required to enhance both their own digital competence and that of their students, with the ultimate aim being to innovate and transform education (Alcibar et al., 2018).

Tourón et al. (2018) define digital competence (DC) as the set of skills and abilities that allow ICT to be integrated and used as a methodological resource within the teaching-learning process, transforming it into technology for learning and knowledge.

In this regard, digital competence should be developed from early education and across various professional activities. This serves as the starting point for the present study, the aim of which is to explore and assess the perceptions of music teachers in state primary and secondary schools across the five provinces of Castilla-La Mancha regarding the digital competence training promoted by the Regional Ministry of Education, Culture and Sports.

1.1. Teacher Digital Competence

Digital competence (DC) in education has been discussed under various perspectives in the literature over decades This is due to the growing popularity of digital technologies and the use of computers in learning, their pedagogical implementation and a more complex teaching approach. Previous studies (Silva et al., 2006; Falcó, 2017) have evidenced the need to bolster this competence in the teaching profession to improve their models of instruction and their skills in the social and occupational realms (Cevallos et al., 2019).

The foundations of digital competence for teaching in Spain were set out by the National Institute of Educational Technology and Teacher Training (INTEF, 2017), with a focus on the mastery of the skills required to use emerging resources and implement them in educational practice. Consequently, teachers face the challenge of educating students within this new teaching paradigm, which has led to the integration of ICT into learning settings (Martínez et al., 2017) and the incorporation of technological devices into their educational environments (Kumar & Kumar, 2018).

The successful incorporation of ICT to a great extent depends on teachers' ability to appropriately organize their instructional strategies (Hernández, 2017). This situation has given rise to a certain resistance to change among members of the educational community (Sorroza et al., 2018), as it involves, among other aspects, significant financial investment, logistical deployment and robust, high-quality training.

The ICT Competency Framework for Teachers (UNESCO, 2018) defined three stages for the integration of digital technology in schools: knowledge acquisition, knowledge deepening and knowledge creation.

Gisbert et al. (2023) note that these stages ensure flexibility for teachers in their educational practice, enabling them to optimize the possibilities such resources provide for improving the teaching-learning process through methodology and resources that are more modern and more aligned with today's students.

Meanwhile, digital devices are capable of creating virtual environments based on information received from the real world (Cabero & Barroso, 2018). They can be adapted to any educational stage and enhance student motivation due to their ease of use and interdisciplinary nature (De la Horra, 2017). Teacher training is thus decisive in safeguarding the quality of instruction and, consequently, in fostering students' optimal learning and their achieving the curricular objectives associated with this competence.

The digitalization of teaching encourages educational professionals to develop the knowledge, skills and attitudes that students need to be able to competently work in a constantly changing society, while promoting inclusion, equity, integration, diversity and quality (Fernández-Batanero & Rodríguez-Martín, 2017; López-Núñez et al., 2020; López et al., 2023). Hence, DTC must be significantly present in the teaching-learning process, must be functional in all aspects of the curriculum and lead to continuous improvement that enhances academic and personal efficacy (Guillén-Gámez et al., 2018). To achieve this, teachers need to possess sufficient skills that enable them to effectively transmit the planned knowledge and abilities.

1.2. Music education and digital teaching competence

Music education is a particularly suitable field for the development of DC, both through the methodological resources used by teachers and through the fundamental content and knowledge inherent to the subject itself. This implies that, in order to effectively acquire this competence, teachers need to be familiar with a wide variety of digital resources (Adams et al., 2017).

The implementation in Spain of the LOMLOE (Organic Law Amending the Organic Law on Education) (2020) has enhanced the importance of this competence, leading to primary and secondary music teachers to broaden or update their knowledge. In fact, many teachers have integrated musical technology into music education (Calderón-Garrido et al., 2020).

In this regard, the Technology Institute for Music Education (TI:ME, 2019) proposed six specific areas of integration, presented in Figure 1.
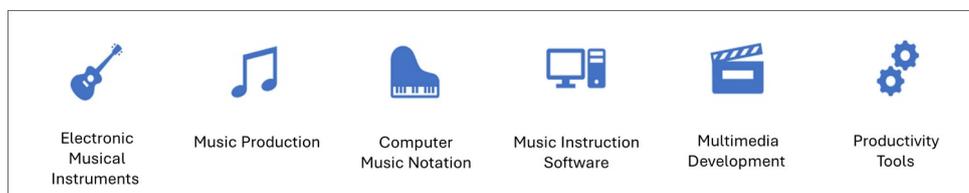
RELATEC Revista Latinoamericana de Tecnología Educativa

Figure 1. Specific areas of integration of ICT in music education. Source: adapted from TI:ME (2019)

These areas engage teachers, students and families, with the latter not always being interested and not always having the training or resources required to participate in their children's virtual learning (Bol, 2020). Additionally, in recent years, controversy has arisen regarding the possible advantages or disadvantages of the use of digital musical tools at early ages, with findings being contradictory. In this sense, Cuervo et al. (2022) report that, despite the considerable number of publications highlighting the positive impact of technology on learning engagement, students' personal development, positive reinforcement, improved attitudes, communication and creativity, among other aspects, there are also significant challenges in music education related to collective musical practice and auditory discrimination. Consequently, music teachers must necessarily take into account pedagogical innovations that require adapting curricular design and classroom organization depending on the ICT resources available, correctly identifying the most appropriate music applications and promoting their successful use (Suárez et al., 2018).

From this perspective, the training programmes implemented by the different Regional Ministries of Education across the Spanish autonomous communities have been essential. One example is the Educational Digitalization Plan of Castilla-La Mancha, which is the focus of our study.

1.3. Educational Digitalization Plan of Castilla-La Mancha

The COVID-19 health crisis forced educational institutions to find swift, efficient solutions to address the new model teaching model that emerged. Consequently, a series of digitalization plans were implemented to reduce the digital divide among 35,000 students of infant, primary and secondary education who lacked the devices and connectivity, particularly in rural areas, needed for their online learning. Furthermore, digital resources were provided to safeguard teaching in this context. At the same time, teachers were obliged to make a significant effort to search for, analyse, select, manage and present digital tools to students in order to adapt teaching–learning processes.

Once the health crisis was over and in-person education returned to schools, the Spanish autonomous communities adopted specific measures related to the digital transformation of schools, with the aim of preventing similar situations in the future. In the case of Castilla-La Mancha, this project had an initial budget of 15.8 million euros for the acquisition of laptops, tablets, routers, SIM cards and webcams, amounting to a total of 57,000 electronic devices (Bravo et al., 2024), as well as for the creation and development of the corporate digital platform EducamosCLM. This platform hosts various tools related to administration, communication and learning. Subsequently, the Ministry of Education, Culture and Sport designed an Educational Digitalization Plan,

grounded in five specific actions (Fig. 2) and seven concrete objectives (Fig. 3), which was implemented between 2021 and 2023 and remains in place, albeit in a residual form, supported and funded by Spanish Ministry of Education and Vocational Training, the Spanish Recovery and Resilience Mechanism and the European Union's Next Generation funds.

The most recent reports published by the Castilla-La Mancha Ministry of Education reveal that, to date, 77,000 students have benefited from the programmes designed to tackle the digital divide and any possible difficulties in access to technology
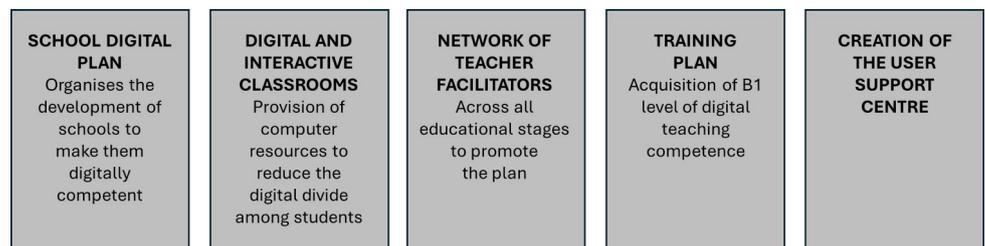
SCHOOL DIGITAL PLAN Organises the development of schools to make them digitally competent	DIGITAL AND INTERACTIVE CLASSROOMS Provision of computer resources to reduce the digital divide among students	NETWORK OF TEACHER FACILITATORS Across all educational stages to promote the plan	TRAINING PLAN Acquisition of B1 level of digital teaching competence	CREATION OF THE USER SUPPORT CENTRE

Figure 2. Specific actions within the DTC Plan of Castilla-La Mancha. Source: own preparation based on https://educamosclm.castillalamancha.es/portal/plan-digitalizacion-educativa

The 2022-2023 school year saw the implementation and updating of tools and resources that required specific training in their use. This led to the creation of a three-phase teacher training plan, thanks to which 80% of primary and secondary school teachers in the region obtained B1 digital certification in June 2023.

Additionally, the purpose of this plan was to bolster the DC of students in the region, facilitate the development and accreditation of DTC and promote the use of active and inclusive methodologies by harnessing digital resources.

To this end, a general, flexible and adapted training programme was designed and divided into three capacity-building modules corresponding to the B1 level of DTC, as follows:

— Module A: guidance and support for teaching staff in promoting the use of new methodologies.

— Module B: creation of digital content.

— Module C: improvement of assessment processes.

Teachers were given a choice between three training methods:

a) In-school training.

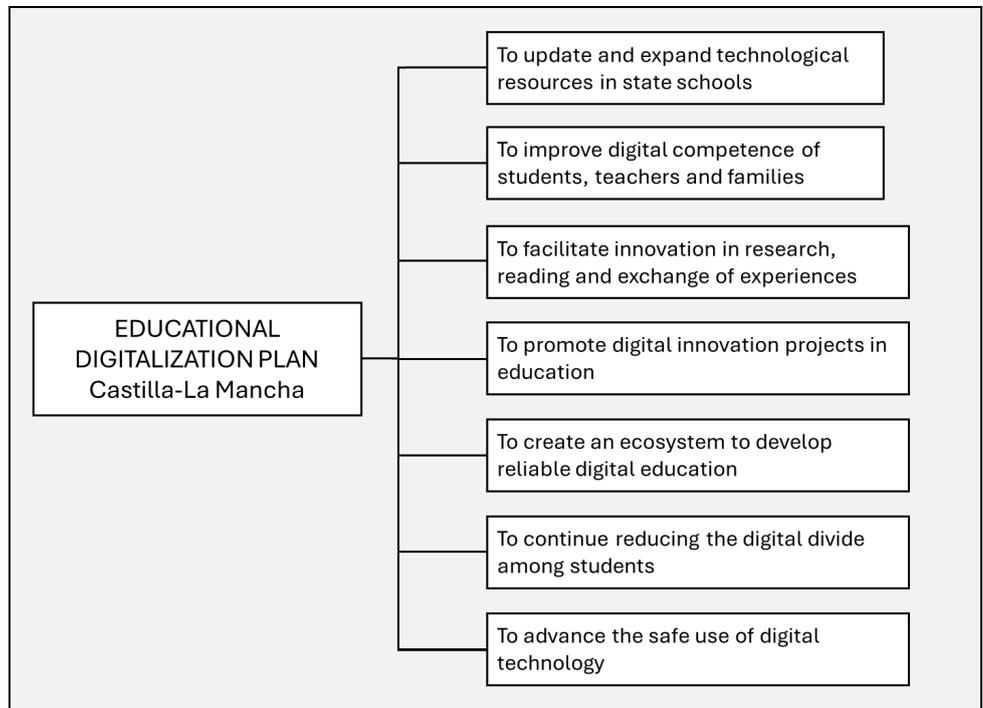b) Online training.

c) Self-training.

Figure 3. Objectives of the Educational Digitalization Plan of Castilla-La Mancha.

At the end of the training period, many teachers expressed the need to further expand their digital knowledge, highlighting the importance of studying specific courses related to their disciplines and curricular areas. This is precisely the foundation of the present study.

In this sense, our research focused on gathering the perceptions of primary and secondary music specialists in Castilla-La Mancha regarding the training received, their interest in specific courses in DTC in music education, and the impact of the training plan on their classroom practice. Hence, the results presented below offer a critical, analytical and reflective perspective on the data provided by the participants in this study.

2. Method

The present quantitative research was carried out during the third term of the 2023/2024 school year in state-run primary and secondary schools in Castilla-La Mancha, the educational institutions that are the focus of the Educational Digitalization Plan implemented by the Regional Ministry of Education of said autonomous community.

The research method used was a descriptive study, by means of which we collected information on the perceptions and particularities of the DTC training process implemented by the Regional Ministry for the period 2021–2023, as well as its impact on the teaching and learning of music in these educational stages. In addition, an inter-

provincial comparative study was undertaken, following Piovani (2017), to analyse the DTC training experiences in the five provinces that make up the autonomous community under study, and to identify similarities and differences, if any, in such training. We also sought to explore participants' converging and diverging views on its effectiveness and applicability in their teaching (Hernández, 2010).

2.1. Sample

According to Order 10/2023 of 18 January, which publishes the official staffing requirement for secondary education teachers, and Order 11/2023 of 18 January, which does the same for primary education, Castilla-La Mancha has 658 primary schools and 237 secondary schools. In turn, the number of music teachers in state schools is 759 (N = 759), of whom 494 (N_1 = 494) are assigned to primary schools and 265 (N_2 = 265) to secondary schools.

To select our participants, we used intentional non-probability sampling (Cardona, 2002; Tójar & Matas, 2009), with the aim of recruiting individuals with specific characteristics relevant to the study. Although our initial intention was for the population and sample sizes to be equivalent, at the end of the survey submission period, the total number of respondents totalled 161 (n = 161), 52 from secondary education and 109 from primary. Applying the finite population formula yielded a 95% confidence level and a sampling error margin of 6.86%, which indicates high reliability and thus a significant alignment with the study population. We hence implemented an intentional sampling strategy designed for targeted access, allowing results to be estimated with an acceptable margin of error, given the sample size and the total population from which it was drawn

The lack of a regional directory with direct contact information for teachers obliged us to distribute the survey through various WhatsApp groups of music teachers from schools of both educational stages across Castilla-La Mancha, as well as through school management teams, who were responsible for forwarding it to the music education specialists on their staff. This enabled rapid and immediate dissemination and response collection, as well as effective real-time follow-up to encourage completion. Moreover, this distribution method facilitated confirmation of delivery and reading, while also enabling easy tracking of questionnaire reception and swift resolution of any queries.

2.2. Instrument

The data collection instrument was an electronic questionnaire, which we designed ad hoc using Google Forms and titled Training in Digital Teaching Competence in the Field of Music Education (F-CDD-EM, in its Spanish acronym). Its structure and configuration were based on the DTC Questionnaire from the EduCLM Digital Plan of the Regional Government of Castilla-La Mancha, designed for the Spanish context of the Digital Competence Framework for Educators (DigCompEdu, 2017), and aligned with the SELFIE and SELFIE for Teachers tools, as well as the Digital Teaching Competence Reference Framework (2022).

The F-CDD-EM was adapted to the reality of music teachers in Castilla-La Mancha through the addition of six variables regarding the respondents' professional profile (gender, age, type of school and educational stage, province, DTC training

undertaken, initial competence level) and a further thirteen related to the applicability of the training received to teachers' professional practice (Table 1). In this regard, the questions included in the instrument were not intended to capture or evaluate teachers' actual competence level, but rather to analyse the extent to which the training was useful in their achieving the B1 level in DTC required by the regional educational administration. These modifications were validated by a group of experts from different disciplines (music education didactics, ICT and education and research methodologies), who evaluated the pertinence, clarity, comprehensibility, relevance and logical distribution of the items included.

Subsequently, we performed an internal consistency analysis, which yielded a Cronbach's alpha of = .98. Following Davenport et al. (2015), this value is highly satisfactory, exceeding the .70 threshold and approaching the statistic's maximum (Alpha= 1).

To complete the survey, participants were asked to indicate their responses using dichotomous YES/NO options, a Likert-type scale (1-Not at all/Never; 2 – A little; 3- Quite a lot; 4- A lot) or ranking/interval scales, selecting the opposition that best fitted their perception and opinion of the DTC training in which they had taken part.

The survey was thus divided into eight dimensions[1] or blocks of interest, comprising a total of 39 variables (Table 1).

Table 1. Dimensions and number of variables on the F-CDD-EM.

Dimensions	Number of Variables***
D.1*: Professional profile of participants	6
D.2**: Area 1. Professional commitment	5
D.3**: Area 2. Digital content	3
D.4**: Area 3. Teaching and learning	3
D.5**: Area 4. Assessment and feedback	2
D.6**: Area 5. Student empowerment	2
D.7**: Area 6. Development of students' digital competence	5
D.8*: Area 7. Applicability of training received	13

* New dimensions specifically created for the F-CDD-EM survey
** Dimensions taken from the questionnaires on which the F-CDD-EM survey was based
*** The content and results of these variables are presented in Tables 2, 3, 4 and 5

Finally, the data were entered into the SPSS v.28 statistical software, which enabled an exhaustive descriptive-comparative analysis of frequencies, central tendency and dispersion. This permitted the understanding of the participants' opinions and perceptions regarding how this DTC training programme impacted their teaching practice.

3. Results

The data analysis is presented in two principal blocks: the descriptive study of the general data, which captures the most important data from each dimension; and the comparative study, which highlights the particular contributions of the music teachers by educational stage and the province of Castilla-La Mancha in which they work.

---

[1] The variables in Areas 1 to 6 can be consulted at: https://intef.es/competencia-digital-educativa/competencia-digital-docente

3.1. Descriptive study of the general data

Despite the striking disparity in the number of male (59) and female (102) participants, no significant gender-related variations were found.

A total of 83.8 % of respondents were aged between 31 and 50, with the most numerous age group being 41 to 45 years.

As regards the participants' initial DTC level (Fig. 6), 36% already met the Ministry of Educations objective of the acquisition of B1, while 31% reported competence below this level and 32.4% presented a higher level.
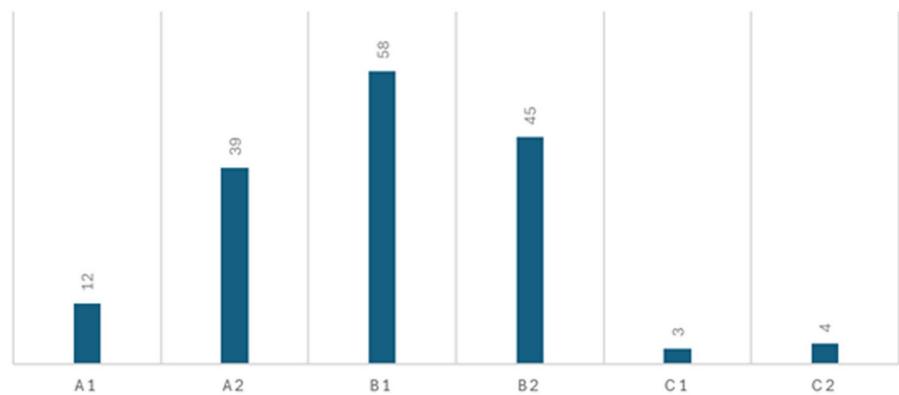

Figure 4. Participants' initial level of DTC.

The data clearly highlight the differences in the population and total number of schools mentioned earlier, with 109 participants teaching in primary education and 52 in secondary education.

The total percentage of participants that completed the training (in any of the three modalities presented in Figures 4 and 5) was 93.2%.

Focusing on the key areas proposed in the training, the respondents believe that it did not sufficiently address the development of tools to independently and systematically implement measures that ensure students' physical and psychological well-being and environmental sustainability (A1.5).

Table 2. Frequencies and central tendencies for Areas 1, 2 and 3.

		Area 1 Variables A1					Area 2 Variables A2			Area 3 Variables A3		
		1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3
M		2.53	2.42	2.46	2.51	2.29	2.56	2.58	2.48	2.41	2.58	2.53
DT		.929	.856	.894	.888	.883	.813	.856	.888	.905	.856	.888
σ		.863	.732	.800	.789	.780	.661	.733	.789	.818	.732	.788
f	1	26	25	27	25	35	19	20	25	31	21	24
	2	47	58	50	47	56	47	47	51	48	43	47
	3	65	64	67	71	59	81	75	67	67	79	71
	4	23	14	17	18	11	14	19	18	15	18	19

The participants' level of satisfaction with the training ranged from medium to medium-high (Tables 2 and 3). In contrast, Variable 6.5 of Area 6 (Implementing activities to develop students' skills for facing the challenges of a digitalized world, such as troubleshooting, basic adjustments and configuration of, and access to, applications) showed a lower mean compared to the other variables, reflecting a perception that the training failed to sufficiently delve into activities aimed at developing students' skills in dealing with digital challenges, including technical problem-solving, basic adjustments and application configuration and accessibility.

Table 3. Frequencies and central tendencies for Areas 4, 5 and 6.

		Area 4		Area 5			Area 6			
		Variables A4		Variables A5			Variables A6			
		4.1	4.2	5.1	5.2	6.1	6.2	6.3	6.4	6.5
M		2.50	2.47	2.39	2.44	2.42	2.39	2.39	2.33	2.28
DT		.792	.837	.815	.835	.803	.792	.822	.820	.831
σ		.627	.701	.665	.698	.645	.627	.676	.672	.690
f	1	18	21	24	25	22	22	24	27	32
	2	57	58	60	51	59	63	62	63	59
	3	74	67	67	74	70	67	64	62	63
	4	12	15	10	11	10	9	11	9	7

Although only minor differences are observed in the variables related to the applicability of the training to teaching practice (Table 4), there is a notable downward trend in teachers' perception of the training's usefulness in music education. In contrast, variable AP8 indicates the extent to which teachers agree that the training would have been more effective if it had been configured by knowledge areas. In the same vein, participants showed strong interest in undertaking DTC training that is specifically applied to Music Education (AP9), and in which they could learn more about how the tools provided by the EducamosCLM platform work (AP10).

Table 4. Participants' perception of the applicability of the training.

		Area 7 Applicability of the training received										
		AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8	AP9	AP10	AP11
M		2.47	2.47	2.58	2.50	2.53	2.46	2.37	2.99	3.09	2.79	2.53
DT		.837	.873	.856	.845	.814	.822	.813	.720	.817	.840	.881
σ		.701	.763	.733	.714	.663	.675	.660	.519	.667	.705	.776
f	1	20	25	18	21	15	20	21	5	10	10	18
	2	61	52	53	54	63	61	72	27	17	47	64
	3	64	68	69	70	65	66	55	93	83	71	55
	4	16	16	21	16	18	14	13	36	51	33	24

3.2. Comparative study by educational stage and province

Broadly speaking, the secondary school teachers' assessment of the training was more negative than that of their primary counterparts, which is evidenced in each of the variables and dimensions included in the F-CDD-EM questionnaire, except AP11, related to the applicability of the learning environment, where greater use by secondary teachers can be seen.

RELATEC Revista Latinoamericana de Tecnología Educativa

Table 5. Comparison of general data by educational stage.

Dimensions	Variables	Media	
	Initial DTC level	PRI	SEC
Profile		2.96	3.09
Area 1. Professional commitment	A1.1	2.57	2.44
	A1.2	2.50	**2.25**
	A1.3	2.56	**2.25**
	A1.4	2.61	**2.29**
	A1.5	2.38	2.10
Area 2. Digital content	A2.1	2.64	**2.38**
	A2.2	2.65	2.42
	A2.3	2.58	**2.29**
Area 3. Teaching and learning	A3.1	2.50	**2.23**
	A3.2	2.71	**2.33**
	A3.3	2.65	**2.27**
Area 4. Assessment and feedback	A4.1	2.58	2.33
	A4.2	2.55	2.31
Area 5. Student empowerment	A5.1	2.50	**2.15**
	A5.2	2.59	**2.13**
Area 6. Development of students' DC	A6.1	2.50	**2.25**
	A6.2	2.49	**2.19**
	A6.3	2.50	**2.13**
	A6.4	2.41	2.15
	A6.5	2.33	2.17
Area 7. Applicability of training	AP1	2.58	**2.25**
	AP2	2.61	**2.17**
	AP3	2.67	**2.38**
	AP4	2.59	2.33
	AP5	2.61	**2.38**
	AP6	2.50	2.37
	AP7	2.43	2.25
	AP8	3.02	2.94
	AP9	3.17	2.90
	AP10	2.87	2.62
	AP11	**2.41**	2.77

The most significant differences were found in the following variables, with secondary education teachers consistently showing lower scores in all of them, except for the aforementioned AP11, in which the opposite occurs:

- A1.2. Identifying and searching for solutions to pedagogical problems that arise when using digital tools.

- A1.3. Participating, according to my needs, in different training activities by means of digital tools outside school.

— A1.4. Autonomously and systematically complying with current regulations on personal data and privacy.

— A2.1. Independently applying strategies to search and select digital content for my classes.

— A2.3. Adopting appropriate strategies for my classes related to sharing, managing and exchanging digital education content and materials.

— A3.1. Independently creating virtual classrooms for the subjects, I teach and using them as resource repositories.

— A3.2. Selecting and using suitable digital resources for my classes.

— A3.3. Routinely incorporating digital technologies into my teaching practice to monitor my students' progress and offer guidance and support in the teaching–learning process.

— A5.1. Routinely incorporating digital technologies into my teaching practice to ensure universal access to learning and to address student diversity by means of techniques such as immersive reader, alternative text, simplified reading, etc.

— A5.2. Independently using digital tools available in the school that foster students' motivation and engagement in their learning.

— A6.1 Implementing activities that develop students' skills in searching, filtering and organizing information.

— A6.2 Putting into practice activities that foster students' safe and responsible communication, collaboration and participation in digital media.

— A6.3 Implementing activities to develop students' skills to create, modify and share digital content while respecting intellectual property and copyright.

— AP1. Being guided and motivated to expand your knowledge of ICT.

— AP2. Starting to use digital tools motivates and inspires me to develop skills.

— AP3. Experimenting with digital tools and understanding the strategies that work best in each context.

— AP5. Effectively and flexibly expanding your repertoire of digital strategies, thereby acting as a source of support and inspiration for colleagues and students.

— AP11. Degree to which I use the EducamosCLM platform, particularly the learning environment.

RELATEC Revista Latinoamericana
de Tecnología Educativa

Table 6. Comparison of data by province and educational stage.

		M									
		AB		CR		CU		GU		TO	
DIM.	VAR.	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC	PRI	SEC
Profile	CDD	2.62	2.96	2.67	3.40	3.50	3.20	3.50	3.50	3.42	3.08
Area 1	A1.1	2.62	2.11	2.50	3.40	2.50	3.00	2.10	2.00	2.65	2.62
	A1.2	2.55	2.00	2.33	3.00	2.25	2.60	2.10	1.50	2.58	2.46
	A1.3	2.59	1.96	2.83	2.60	2.75	2.60	2.20	1.50	2.55	2.69
	A1.4	2.66	2.11	2.83	2.60	2.75	2.40	2.40	2.50	2.55	2.46
	A1.5	2.43	1.78	2.83	2.80	2.75	2.40	2.10	2.00	2.23	2.38
Area 2	A2.1	2.71	2.07	2.67	3.20	2.50	3.20	2.30	2.00	2.65	2.46
	A2.2	2.64	2.15	2.50	3.20	2.75	3.00	2.60	1.50	2.71	2.62
	A2.3	2.59	1.93	2.33	3.00	2.50	3.00	2.40	2.00	2.68	2.54
Area 3	A3.1	2.43	2.07	2.50	2.80	2.75	2.60	2.40	2.00	2.61	2.23
	A3.2	2.76	2.11	2.83	2.80	2.75	3.00	2.20	1.50	2.74	2.46
	A3.3	2.66	2.07	2.50	3.40	2.75	2.60	2.30	2.00	2.77	2.15
Area 4	A4.1	2.59	2.11	2.50	3.00	2.75	2.80	2.30	2.00	2.65	2.38
	A4.2	2.55	2.07	2.67	3.00	2.75	2.40	2.20	2.50	2.61	2.46
Area 5	A5.1	2.53	2.04	2.50	2.20	2.75	2.60	2.10	1.50	2.55	2.31
	A5.2	2.59	2.04	2.83	2.40	2.50	2.40	2.40	1.50	2.61	2.23
Area 6	A6.1	2.50	1.96	2.33	3.00	2.75	2.60	2.40	2.00	2.55	2.46
	A6.2	2.48	1.93	2.50	2.80	2.50	2.60	2.20	2.00	2.58	2.38
	A6.3	2.50	2.00	2.33	2.60	2.75	2.20	2.40	1.50	2.55	2.31
	A6.4	2.41	1.96	2.33	2.80	2.75	2.40	2.10	1.50	2.48	2.31
	A6.5	2.28	1.96	2.50	2.60	2.75	2.80	2.10	1.50	2.42	2.31
Area 7	AP1	2.66	1.93	2.33	3.00	2.75	2.60	2.30	1.50	2.55	2.62
	AP2	2.69	1.85	2.50	3.00	2.50	2.80	2.20	2.00	2.61	2.31
	AP3	2.67	1.96	2.83	3.20	2.75	3.00	2.50	2.00	2.68	2.77
	AP4	2.64	2.04	2.17	2.80	2.75	2.60	2.50	1.50	2.58	2.77
	AP5	2.69	2.11	2.33	3.00	2.50	2.60	2.40	2.50	2.58	2.62
	AP6	2.48	2.00	2.50	3.00	2.50	2.80	2.40	2.50	2.58	2.69
	AP7	2.45	1.96	2.50	3.20	2.75	2.40	2.20	1.50	2.42	2.54
	AP8	3.05	2.85	2.67	3.00	3.00	3.40	3.30	3.50	2.94	2.85
	AP9	3.19	2.78	3.00	3.40	3.00	3.60	3.60	1.50	3.06	2.92
	AP10	2.84	2.44	3.17	2.80	3.25	3.20	3.00	2.50	2.77	2.69
	AP11	2.26	2.67	2.83	3.20	3.00	3.00	2.20	3.00	2.61	2.69

AB: Albacete / CR: Ciudad Real / CU: Cuenca / GU: Guadalajara / TO: Toledo

As shown in Table 6, the provinces of Albacete, Toledo and Guadalajara follow a general downward trend. Broadly speaking, the values obtained for the secondary school teachers are more negative than those for their primary counterparts, especially among the secondary school teachers in Guadalajara and Albacete, who show a higher

level of dissatisfaction. In contrast, the teachers in Cuenca and Ciudad Real report the most positive levels of satisfaction.

Particularly important is the high score the teachers give to variables AP8 y AP9 concerning the need for more specific training in music education and the ineffectiveness of the general training received. Likewise, it is worth highlighting the mean score for AP10, related to the knowledge and use of the EducamosCLM platform, training for which is perceived as insufficient. In this sense, the respondents report that they typically use other digital resources with which they are more familiar and that the training received neither presented them this application nor allowed them to deepen their knowledge of how to use it. This finding is striking since EducamosCLM is the corporate tool administered by the Regional Ministry of Education and three years have passed since it was first implemented.

4. Conclusions

At a general level, the most significant finding is the teachers' interest in improving their digital competence, which coincides with the studies by Falcó (2017) and Cevallos et al. (2019), who underline the need to strengthen training in this area. In this regard, 93.2% of the teachers who participated in the study completed the training in one of its modalities, reporting a level of satisfaction from medium to medium-high. It is also noteworthy that training at their schools (in-person) was the most frequently requested option.

The lack of specialization in content was one of the two aspects rated lowest by the teachers surveyed. In fact, most respondents favour continuing their training, which aligns with the findings of Calderón-Garrido (2020) on the importance and positive reception of ICT in music classrooms.

It is worth noting the limited training received on the educational environment provided by the Regional Ministry of Education, Culture and Sports, as well as on the corporate platform most routinely used by teachers. Both parameters show a medium-low level of satisfaction. In this respect, the results diverge from the findings of Hernández (2017) and Guillén-Gámez (2018) regarding the importance of high-quality training.

In addition, the delay in delivering the interactive digital panels to schools and the resulting discontent caused by the fact that music classrooms were scarcely equipped with such panels hindered the effective application of the content offered in the training programme. Consequently, this aspect was negatively evaluated by our participants.

Despite the problems described above, or rather precisely because of them, the analysis of the data underlines the irreplaceable role of teachers as mediators between digital opportunities and their students. It is teachers who, through their digital competence training and their knowledge and use of the tools available in schools, foster the improvement of such skills. It is thus the responsibility of the relevant authorities to provide schools with the essential digital resources and the corresponding training that ensures continuous and up-to-date training for teachers that is adapted to the needs and demands of students. This notion contrasts with the

results obtained in the variables of Area 6. The statistics reveal a significant insufficiency in the training provided regarding the development of DC among students, which underlines the importance of the reflections of Martínez et al. (2017) on the challenge involved in properly educating our students.

Drawing on the above and considering that teachers are key agents in students' access to technology, it may be interpreted that the training process in question failed to provide them with sufficient strategies for developing digital citizenship skills, critical thinking and student safety, and thus for fostering the critical and productive use of ICT.

With regard to the limitations of the present study, the initial difficulty lay in the lack of a regional directory with the contact data of teachers in Castilla-La Mancha, which made it impossible to communicate with all the teachers in the autonomous community. Nonetheless, a significant number of teachers took part in the research, which reflects a positive attitude towards the training process and its assessment. Additionally, the markedly general nature of the training did not allow for a deeper examination of aspects related to music education and ICT. In our view, this drawback represents, however, an opportunity for future research that might explore, broaden and enrich this issue, repositioning it within the specific context of music education.

Finally, it is worth highlighting that our study opens the door to similar ones on the current situation of the development of DTC in the other autonomous communities of Spain, as well as in international contexts. This could provide the opportunity to compare and contrast data with which to assess the pertinence of the training plans that have been implemented, to evaluate the impact of European funds devoted to the digitalization of education, or to highlight the opinions and working conditions of music specialists (and those of other specialties and disciplines) in this field, among other aspects. Only in this way will it be possible to efficiently and effectively address the enhancement of this competence.

Determining the needs of our educational communities, and, in particular, understanding the evolution of teaching-learning processes in this digital transformation, is only possible if the reality of classrooms is known first-hand. In this sense, it is teachers who have the most to contribute, while it is the responsibility of researchers to gather their insights and of educational authorities to take them into account. In our view, this is an indispensable step in the pursuit of educational excellence in Spain.

5. Referencias

Adams, S., Cummins, M., Davis, A. Freeman, A., Hall, C. & Ananthanarayanan, V. (2017). *NMC Horizon Report: 2017 Higher Education Edition*. The New Media Consortium.

Alcibar, M., Monroy, A. & Jiménez, M. (2018). Impacto y Aprovechamiento de las Tecnologías de la Información y las Comunicaciones en la Educación Superior. *Información Tecnológica, 5*(29), 101-110. https://doi.org/10.4067/S0718-07642018000500101

Bol, T. (2020, abril 30). Inequality in homeschooling during the corona crisis in the Netherlands. First Results from the LISS Panel. *University of Amsterdam*. https://doi.org/10.31235/osf.io/hf32q

Bravo, R., López, N. J & Mateo, A. (2024). Music teaching in primary schools of Albacete, Spain, during the COVID-19 pandemic. *British Journal of Music Education, 41*, 114-26. https://doi.org/10.1017/S0265051723000281

Cabero, J. & Barroso, J. (2018). Los escenarios tecnológicos en realidad aumentada (RA): Posibilidades educativas. *Aula Abierta, 47*(3), 327-336. https://doi.org/10.17811/rifie.47.3.2018.327-336

Calderón-Garrido, D., Carrera, X. & Gustems-Carnicer, J. (2020). La competencia digital docente del profesorado universitario de música: diseño y validación de un instrumento. *ALOMA. Revista de Psicologia, Ciènces de 'Educació i de l'Esport, 38*, 139-148. https://doi.org/10.51698/aloma.2020.38.2.139-148

Cardona, M. C. (2002). *Introducción a los métodos de investigación en educación*. EOS

Cevallos, J., Lucas, X., Paredes, J. & Tomalá, J. (2019). Beneficios del uso de herramientas tecnológicas en el aula para generar motivación en los estudiantes. *Revista Ciencias Pedagógicas E Innovación, 7*(2), 86-93. https://doi.org/10.26423/rcpi.v7i2.304

Cuervo, L., Bonastre, C. & García, D. (2022). Tecnología digital en la Educación Musical infantil. *Praxis & Saber, 13*(32), 1-15. https://doi.org/10.19053/22160159.v13.n32.2022.13201

De la Horra, G. I. (2017). Realidad aumentada, una revolución educativa. *Revista de Educación Mediática y TIC, 6*(1), 9-22. https://doi.org/10.21071/edmetic.v6i1.5762

Falcó, J. M. (2017). Evaluación de la competencia digital docente en la Comunidad Autónoma de Aragón. REDIE. *Revista Electrónica de Investigación Educativa, 19*(4), 73-83. https://doi.org/10.24320/redie.2017.19.4.1359

Fernández-Batanero, J. M. & Rodríguez, A. (2017). TIC y diversidad funcional: conocimiento del profesorado. *European Journal of Investigation in Health, Psychology and Education, 7*(3), 157-175. https://idus.us.es/items/27597e03-132f-40a2-9e22-487c79c3b38e

Fuentes, A. & López, J. (2018). TIC-TAC: Las tecnologías de la información y la comunicación en la era del acceso. Una experiencia en la educación superior. En I. Arco y P. Silva (Eds.), *Tendencias nacionales e internacionales en organización educativa: Entre la estabilidad y el cambio* (pp. 712-727). Wolters Kluwer.

Gisbert, V., Fontes, R., Calderón-Garrido, D. & Anguita, J. M. (2023). Teacher involvement in the use of digital tools in conservatory, municipal music school and university classrooms. *Per Musi, 24*, 1-18. https://orcid.org/0000-0003-1763-1143

Guillén-Gámez, F.D., Álvarez-García, F.J. & Rodríguez, I.M. (2018). Digital tablets in the music classroom: A study about the academic performance of students in the BYOD context. *Journal of Music, Technology & Education, 11*(2), 171-182. https://doi.org/10.1386/jmte.11.2.171_1

Hernández, J.E. (2010). Los estudios de caso y el método comparativo: una estrategia en la investigación educativa. *V Foro de Investigación Educativa*, 70-74.

RELATEC Revista Latinoamericana
de Tecnología Educativa

https://www.repositoriodigital.ipn.mx/handle/123456789/3314

Hernández, R. M. (2017). Impacto de las TIC en la educación: Retos y perspectivas. *Propósitos y Representaciones, 5*(1), 325-347. https://doi.org/10.20511/pyr2017.v5n1.149

INTEF (2017, septiembre 1). Marco común de competencia digital docente. *Ministerio de Educación, Formación Profesional y Deportes.* https://intef.es/Noticias/marco-comun-de-competencia-digital-docente-septiembre-2017/

Khan, M.S.H. & Markauskaite, L. (2017). Approaches to ICT-enhanced teaching in technical and vocational education: a phenomenographic perspective, *Higher Educ, 73*(5), 691-707. https://www.jstor.org/stable/26447804

Kumar, A. & Kumar, G. (2018). The role of ICT in higher education for the 21st century: ICT as a change agent for education. *Multidisciplinary Higher Education, Research, Dynamics & Concepts: Opportunities & Challenges for Sustainable Development, 1*(1), 76-83.

Ley Orgánica 3/2020, de 29 de diciembre, por la que se modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación. Boletín Oficial del Estado, 340, de 30 de diciembre de 2020, 122868-122953. https://www.boe.es/eli/es/lo/2020/12/29/3

López, H., Val, S. & Gaeta, M. L. (2023). Importancia de la Digitalización Docente para una Educación Inclusiva, Crítica y Equitativa. *Revista Internacional de Educación para la Justicia Social, 12*(1), 211-227. https://doi.org/10.15366/riejs2023.12.1.012

López-Núñez, J. A., Campos-Soto, M. N., Aznar-Díaz, I. & Rodríguez-Jiménez, C. (2020). Competencia digital del profesorado para la atención al alumnado con dificultades de aprendizaje. Una revisión teórica. *Revista Electrónica Interuniversitaria de Formación del Profesorado, 23*(2), 143–154. https://doi.org/10.6018/reifop.419171

Martínez, L. D., Hinojo, F. J. & Rodríguez, A. M. (2017). Fortalezas, debilidades y concepciones que tienen los profesores al momento de implementar las TIC en sus procesos de enseñanza. *Revista Científica Electrónica de Educación y Comunicación en la Sociedad del Conocimiento, 17*(2), 297-316.

Morales, A. (2008). *La educación musical en Primaria durante la LOGSE en la Comunidad de Madrid: análisis y evaluación.* [Tesis doctoral sin publicar] Universidad Autónoma de Madrid.

Orden 10/2023, de 18 de enero, de la Consejería de Educación, Cultura y Deportes, por la que se publica la plantilla orgánica de los centros docentes dependientes de la misma, donde imparten enseñanza los funcionarios de los Cuerpos de Catedráticos de Enseñanza Secundaria, Profesores de Enseñanza Secundaria, Profesores Técnicos de Formación Profesional, Catedráticos de Escuelas Oficiales de Idiomas, Profesores de Escuelas Oficiales de Idiomas, Profesores de Música y Artes Escénicas, Catedráticos de Artes Plásticas y Diseño, Profesores de Artes Plásticas y Diseño y Maestros de Taller de Artes Plásticas y Diseño.

Orden 11/2023, de 18 de enero, de la Consejería de Educación, Cultura y Deportes, por la que se publica la plantilla, la composición de unidades y otros datos de determinados colegios de educación infantil y primaria, colegios rurales agrupados y centros de educación especial.

Piovani, J.I. (2017). Los estudios comparativos: algunas notas históricas, epistemológicas y metodológicas. *Educaçao & Realidade, 42* (3), 821-840. http://dx.doi.org/10.1590/2175-623667609

Silva, J., Gros, B., Garrido, J. M. & Rodríguez, J. (2006). Estándares en tecnologías de la información y la comunicación para la formación inicial docente: situación actual y el caso chileno. *Revista Iberoamericana de Educación, 38*(3), 1-16. https://rieoei.org/RIE/article/view/2658

Sorroza, N. A., Jinez, J. P., Rodríguez, J. E., Caraguay, W. A. & Sotomayor, M. V. (2018). Las TIC y la resistencia al cambio en la educación superior. *Revista Científica*

Mundo de la Investigación y el Conocimiento, 2(2), 477-495. https://doi.org/10.26820/recimundo/2.(2).2018.477-495

Suárez, J., Almerich, G., Orellana, N. & Díaz, I. (2018). A basic model of integration of ICT by teachers: competence and use. *Educational Technology Research and Development, 66*(5), 1165-1187. https://doi.org/10.1007/s11423-018-9591-0

TI:ME. Technology in Music Education (2019). Areas of Pedagogical Skill and Understanding (TAPSU). https://ti-me.org/index.php?option=com_content&view=article&id=2257&Itemid=1606

Tójar, J. C. & Matas, A. (2009). Fundamentos metodológicos básicos. En A. Pantoja (Coord.), *Manual básico para la realización de tesinas, tesis y trabajos de investigación* (pp. 127–152). EOS.

Tourón, J.; Martín, D., Navarro, E., Pradas, S. & Iñigo, V. (2018). Validación de constructo de un instrumento para medir la Competencia digital docente de los profesores (CDD). *Revista Española de Pedagogía, 269*, 25-54. https://revistas.unir.net/index.php/rep

UNESCO (2012). *ICT in education in Latin America and the Caribbean a regional analysis of ICT integration and e-readiness*. United Nations Educational Scientific and Cultural Organization.

UNESCO (2018). *ICR Competency Framework for Teachers*. United Nations Educational Scientific and Cultural Organization.