

## *Flipped Learning* in the subject «music» of *E.S.O.* [Compulsory Secondary Education] within a rural environment: impact on students and families

### Abstract

This study has as its purpose to ascertain and analyze the impact caused by the implementation of the *Flipped Learning* model on the students enrolled in the subject «music» of Spain's public Compulsory Secondary Education, as well as on their families, within a rural environment. A total of 25 female and male students and 13 relatives took part in the study. A methodology based on a mixed descriptive approach including the design of a collective case study was used. Data collection took place through the utilization of tools such as a questionnaire of a quantitative and qualitative nature administered after the experience and the establishment of discussion groups. The results show that both the students and their families have a favorable opinion about using the *Flipped Learning* model in the music classroom on a daily basis. They find no significant barriers or drawbacks beyond families' concern about potential technology-related problems derived from the economic investment required and an overexposure to screens. The conclusions drawn point at the relevance of integrating active methodologies, among them *Flipped Learning*, into music teaching.

**Keywords:** *flipped learning*, digital technology, music learning, compulsory secondary education, rural environment

### 1. Introduction

A *flipped approach* is one which incorporates technologies into the teaching of a subject (Froehlich, 2018). Students adopt an active role therein: outside the classroom they access multimedia resources provided by the teacher; the time during which they stay in the classroom thus becomes a fluid work environment (Serrano & Casanova, 2018) with the aim of creating more space and time for learners and educators to interact, which in turn favors more personalized learning (Pandow & Inan, 2020).

According to the scientific literature, the terms that can be more easily identified with the concept described above are *Flipped classroom* (FC) and *Flipped learning* (FL). Although, in principle, the notion conveyed in both terms stems from the same flipped approach, the noun accompanying it —“classroom” or “learning”— has been changing depending on the way of seeing or understanding the meaning of both terms or, at least, in their central idea. FL is considered to be a model that comprises more elements than FC. Basically, FC implies watching videos “at home” on an individual basis and carrying out activities to recall, understand, and even analyze and apply the acquired knowledge. What FL seeks is to transform and assign more importance to work group space in the classroom, with the intention of performing tasks and activities with a higher cognitive level that involve students in a more active and creative manner. For this purpose, activities are previously planned and programmed based on active learning methods such as Project-based Learning, Problem-based Learning, Challenge-based Learning, Service Learning, Learning by Discovery and Cooperative Learning, among others. It all offers

benefits typical of a more creative, dynamic, and interactive type of learning (Santiago & Bergmann, 2018). In short, as pointed out by Gnutova (2020), “flipped learning implies more conceptual changes in the learning process, namely, a radical rethinking of the role of the teacher, the student and the content of their face-to-face time.” (p. 86). From this perspective, therefore, learning fosters students’ personal autonomy (Author 2 & Author 1, 2022).

On another note, the growing international collaboration between educational professionals who use the FL model has provided evidence that, after implementing it for more than ten years at various levels and in different countries, the term *Flipped Learning* has come to be defined on a particular or local basis. Hence the need to find a global definition understood and agreed upon by everyone worldwide. Thus, the organization *Flipped Learning Global Initiative*, where this model originated, proposed the following modern, international definition which has been updated and ratified through the study, work, and consensus of 100 experts from 49 countries:

*“Flipped Learning is a framework that enables educators to reach every student. The Flipped approach inverts the traditional classroom model by introducing course concepts before class, allowing educators to use class time to guide each student through active, practical, innovative applications of the course principles.”* (Flipped Learning Global Initiative, 2019)

Concerning ICT utilization in FL, Serrano and Casanova (2018) referred to their key importance for educators to be able to successfully apply this pedagogical approach. As for music education, it can be said that an interrelationship has always existed between technology and music (Albert, 2020; Calderón-Garrido et al., 2020; Hernández-Serrano et al., 2022; Parkita, 2021).

Furthermore, music is inherent to any type of society. It helps individuals to achieve holistic learning in general and contributes to better cognitive functioning through study and practice (Caravaglios et al., 2021). For all these reasons, the subject area of music education has already formed part of the curricula of compulsory teaching courses in most western countries for years (Pérez-Moreno & Carrillo, 2020). In the case of Spain, music education and learning became widespread in the compulsory syllabuses of primary and secondary education during the 1990s (Carrillo et al., 2017). Since then, it has been present in all the successive general laws on education.

As for education in rural environments, difficulties exist to define or create a definition of the term ‘rural’ or the concept of ‘rurality’ that may seem acceptable to every country and which can be used in any situation. Studies such as that of Fargas-Malet and Bagley (2021), focused on the European context, show us a review of 21<sup>st</sup> century research on small rural schools in Europe. These scholars explained that, when trying to specify or define “the rural” or “rurality”, most definitions are largely based on population density and distance between settlements. Likewise, they came to the conclusion that significant gaps existed in this field of study, including the lack of theorization about some topics and the absence of research including students’ participation.

In relation to rural educational centers and ICTs, the need arguably arises to improve the digital competence of these centers (Hilli, 2020; Quiroz & Lázaro, 2020), along with that of their educational community, so that the latter can act as a drive belt to help consolidate a more inclusive and integrative education inside today’s globalized society

(Quiroz & Lázaro, 2020). The challenge faced within that improvement of digital competence would not only consist of enhancing the connectivity and availability of the necessary digital material resources in all rural schools, many of which already have them, but also in giving a response and suggesting how teachers can adequately harness the possibilities offered by ICTs (Cabero & Marín, 2017). The aims sought are to adapt them to the rural social context and to synergically implement the curriculum through innovative projects and actions with educators, learners, families, and educational institutions (Iglesias et al., 2018), all of which could make it easier to ensure the full social and educational inclusion of students.

Thus, our study seeks to go beyond the traditional aesthetic, emotional, and cognitive aspects associated with music and its learning. The aim pursued in this case consists in identifying the impact that the use of technology and the Flipped Learning model have had on Compulsory Secondary Education (*ESO* for its initials in Spanish) students and their families with regard to the teaching-learning process in the subject «music». From that premise, these are the specific objectives of our study:

1. Getting to know the degree of acceptance for the implementation of the Flipped Learning model in music learning among students and their families; and
2. Exploring the potential benefits and limitations in the teaching-learning process based on the *Flipped Learning* model.

In order to accomplish those goals, the following research questions are posed which, according to Stake (1999), can serve as a guide to design the field of work and its scope:

- Are students satisfied with the use of ICTs?
- Are family members satisfied with the use of ICTs?
- What advantages or drawbacks students identify?
- What advantages or drawbacks family members identify?

## **2. Methodology**

### *1.1 Context and participants*

This study took place in a public ESO center located in a small rural inland municipality of the Alicante province (Spain). It is considered a rural area because of its low population density and its location at a long distance from the nearest towns. This center acts as a “hub” where students from several nearby villages attend classes. The reason for choosing this center was that one of the co-authors of the study developed his professional activity as a music teacher there.

The sample of participants comprised the students enrolled in the first three years of ESO, in which music is a compulsory subject, together with those in the fourth year of ESO, where music is an elective subject. The total number of participants amounted to 25 students (N=25), with 56% of boys (14) and 44% of girls (11), the total population being 36. Their ages ranged between 12 and 17 years. We also counted on the participation of 13 members of their families, 62% of whom were females (8) and 38% males (5). All the students had been taught music since Primary Education with little use of ICTs, never having worked under the FL model.

### *1.2 Instrument*

The data collection tools were individual anonymous questionnaires complemented with discussion groups. We administered two individual anonymous questionnaires to students, one before the experience (pre-test) and another after it had finished (post-test). The questionnaires developed by Holik (2016) were translated, adapted, and validated for this study. The initial questionnaire included eight close-ended questions structured into a multiple-choice format and an open-ended one exclusively meant to detect possible problems concerning students' regular access to digital technologies outside the educational center, as well as to ascertain the degree of familiarity with the FL model and to know whether they had had previous experiences with it. The final questionnaire was made up of twenty items: two Likert-type questions with values ranging between 1 and 4 for interviewees to specify the level of agreement or disagreement; nine multiple-choice questions; six close-ended YES/NO questions; and three open-ended ones. This mixed (qualitative and quantitative) questionnaire was organized into three blocks: Autonomy; Satisfaction; and Learning.

As for families, a decision was made to use a single questionnaire translated, adapted, and validated from that of Smith (2015) at the end of the experience which comprised 6 questions, four of them open-ended while the other two were single-option close-ended questions. The same as with the one addressed to students, the questionnaire revolved around three areas: Autonomy; Satisfaction; and Learning.

### *1.3 Procedure*

#### *1.3.1 Information collection and processing*

The results obtained in the initial questionnaire for students served to verify that an educational experience according to the FL model could be carried out with no digital divide whatsoever among learners (training and device availability). Had that not been the case, we would have been obliged to solve these problems prior to starting.

Fieldwork developed for 24 weeks during the January-June semester of the academic year, using the *Flipped Learning* model as a working method twice a week in 50-minute-long sessions. As an introductory stage, between September and December: a) we utilized short videos meant to provide small educational pills about FL; b) initiated and guided students in the use of the Edpuzzle platform of videos enriched with questions; and c) consolidated the implementation of the Schoology virtual learning platform.

At the same time, we kept in touch with the families and held meetings to inform them about the research project, to explain the FC and FL models to them, and to reach an agreement on the family-school collaboration procedure. In this case, families only had to monitor and encourage that the video-viewing "task" was fulfilled. These were the videos that presented the theoretical contents outside the classroom. Explanatory and demonstrative videos enriched with questions through the Edpuzzle web platform were used to that end. The videos focused on learning concepts associated with Musical Theory, History of Music, and the incorporation of digital tools for their use in works and presentations (e.g. generators of word clouds or sound edition software programs such as "Audacity").

Already in the classroom, gamified evaluation questionnaires were prepared using another web platform, Kahoot, both individually and on a group basis, followed by a joint discussion and clarification of doubts, after which active methodologies were put into

practice (Segura-Robles et al., 2020). We performed activities which required integrating various types of knowledge, skills, attitudes, and values, always bearing in mind both attention to diversity and respect for the different learning paces and styles. We thus favored both individual and collaborative work, as well as peer instruction and tasks carried out by means of Project-Based Learning (PBL). The specific contents of each level can be found in the supplementary material published as an annex in XXX [blind link].

For those students —not more than five— who experienced some type of learning difficulty with the presented videos or texts, a decision was made to use either In-Class Flip (help provided by the teacher in class for unclear contents) or Peer Instruction (collaboration between students) as the main support strategy. In this regard, it deserves to be highlighted that none of the learners who needed help was a student with special learning needs.

On the other hand, it is worth pointing out that music teaching and the implementation of the FL model were carried out by the musician-musicologist-lecturer and educational researcher who co-authored this study. In his capacity as a teacher-researcher, he already owned previous training and knowledge in FC and FL. A special mention must be made in this sense of the courses organized by La Rioja University's General Foundation, in collaboration with MT Educación y Formación, alongside the participation in the II European Conference on Flipped Classroom held in Saragossa between 6th and 8th May, 2016, which counted on speakers such as Jon Bergmann and Aaron Sams —precursors of the FC model.

Collaboration with the center's Orientation Department staff was ensured throughout the research process. Its representative, identified as female, was always present, both during the collection of questionnaires and in the discussion groups. The families were informed and asked for permission so that students could take part in the study. Participants were treated at all times in accordance with ethical and informed consent standards, permanently guaranteeing both confidentiality and anonymity.

When the educational experience came to its close, data were collected through the final questionnaires, as well as by means of discussion groups, which in turn permitted to obtain a temporal data triangulation (Aguilar & Barroso, 2015). This provides a more holistic vision about the results and an attempt is made to check whether each case “remains unaltered at other moments, in other spaces or when people interact differently” (Stake, 1999, p. 98). The information channeled via questionnaires was collected in paper format from all classroom groups. We recorded and stored the discussion forums in digital audio media.

### *1.3.2 Design and data analysis*

The methodology utilized is framed within a mixed descriptive approach (Tashakkori & Teddlie, 1998). Regarding design, we opted for collective case study as our research strategy where each class-group was one case. Such a research design pursues to achieve a better understanding of the cases examined, not only appreciating their respective singularity but also their insertion and interrelationship with the context at hand (Stake, 1999).

The strategies applied to data analysis were the reduction, categorization, and coding of information with the aim of finding arguments, probabilities, and frequencies that

could support our conclusions (Denzin & Lincoln, 1994). For result building purposes, our analysis of the final questionnaires and the discussion groups related the research objectives to the variable “perceived usefulness” according to the Technological Acceptance Model (TAM) (Davis et al., 1989) (Fig. 1).

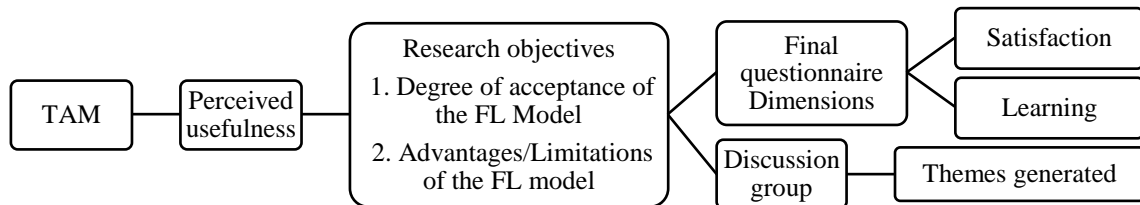


Figure 1. *Relationship between research objectives and evaluation instruments in accordance with the Technological Acceptance Model (TAM) (Davis et al., 1989).*

*Source: own elaboration*

The statistical software package SPSS 20 served to analyze the data quantitatively, proceeding to carry out descriptive analyses of frequencies, percentages, averages, standard deviations, and modes. Qualitative analysis was undertaken using the qualitative analysis software ATLAS.ti 9: we gathered data and literal transcripts, and performed reduction as well as categorization by themes, frequencies, codes and code maps. Each code map comprised a range of topics and inferential codes dependent on them which were related to TAM’s “perceived usefulness” variable. A small previously prepared script-questionnaire was followed to organize each discussion group which had as its sole aim to serve as a general guide during group discussion; at no time was it used to direct the discussion focus.

### 3. Analysis and results

Our findings are presented in accordance with the two objectives and the research questions established from the beginning. For each objective, we show and combine the results obtained from the final questionnaires and the discussion groups of students as well as families, adding transcribed parts as examples.

#### 3.1. *Acceptance of the Flipped Learning model in music learning*

In the analysis of the first objective concerning the degree of acceptance shown by students and their families towards the use of the *Flipped Learning* model in music learning, we can see in Table 1 the results for questions 6, 14, 16, and 17 of the final questionnaire belonging to the Satisfaction and Learning blocks. A high degree of acceptance for the *Flipped Learning* model becomes visible, both on an individual basis and by cases, and judging from the total average of the four cases, corresponding to each one of the ESO years. As can be seen, 79.0% of the total would like to use the FL model again during the following academic year; a vast majority (87.2%) would advise their friends to use the FL model; 71.15% of interviewees thought that the FL model had allowed them to do better, academically speaking, than in a traditional classroom; and 71.85% felt more deeply involved in their learning than they did with traditional teaching.

Likewise, Table 2 provides the results for item 13 in the final questionnaire for students (belonging to the Learning block) in relation to the flipped learning elements that turned out to be more useful. Importantly, evidence was obtained that, both individually and considering the average of all four cases, 74.73% of the total agreed at a level of *I strongly agree* (4); *I agree* (3) that the flipped classroom proved useful to have more time to interact with their teacher; 71.18% of interviewees considered at a level of *I strongly agree* (4); *I agree* (3) that they had been given more freedom to work at their own pace; and according to a vast majority (83.65%), at a level of *I strongly agree* (4); *I agree* (3) their teacher had more time available to display specific skills.

Table 1

*Students' perception about the usefulness of the Flipped Learning model in their music learning*

Questions <sup>a</sup>	Answer <sup>b</sup>	1 <sup>st</sup> ESO <sup>c</sup>		2 <sup>nd</sup> ESO <sup>d</sup>		3 <sup>rd</sup> ESO <sup>f</sup>		4 <sup>th</sup> ESO <sup>g</sup>		TOTAL	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
6. Would you like to see more digital lessons (videos enriched with questions) incorporated into the subject «music» for the next academic year?	Yes	9	100	6	85.70	4	80.00	2	50.00	21	79.00
	No	0	0.00	1	14.30	1	20.00	2	50.00	4	21.18
14. Would you recommend the flipped classroom atmosphere to your friends?	Yes	8	88.90	7	100	3	60.00	4	100	22	87.23
	No	1	11.10	0	0.00	2	40.00	0	0.00	3	12.78
16. Do you feel that you did better, academically speaking, in the flipped classroom, compared to a traditional class?	Yes	8	88.90	6	85.70	3	60.00	2	50.00	19	71.15
	No	1	11.10	1	14.30	2	40.00	2	50.00	6	28.85
17. Do you think that you were more deeply involved with your learning in the flipped classroom than in traditional teaching?	Yes	6	66.70	6	85.70	3	60.00	3	75.00	18	71.85
	No	3	33.10	1	14.30	2	40.00	1	25.00	7	28.10

Note.<sup>a</sup> Questions 6 and 14 belong to the Satisfaction block. Questions 16 and 17 belong to the Learning block.

<sup>b</sup> All the students validly answered the close-ended questions in which they could only tick YES or NO.

<sup>c</sup> 12-to-13-year-old students

<sup>d</sup> 13-to-14-year-old students

<sup>e</sup> 14-to-15-year-old students

<sup>f</sup> 15-to-16-year-old students

Table 2

*Descriptive reports about the flipped learning elements which turned out to be more useful in the four cases*

Questions	Items <sup>a</sup>	1 <sup>st</sup> ESO <sup>b</sup>	2 <sup>nd</sup> ESO <sup>c</sup>	3 <sup>rd</sup> ESO <sup>d</sup>	4 <sup>th</sup> ESO <sup>e</sup>	TOTAL
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		<i>Mda+Da</i> %	<i>Mda+Da</i> %	<i>Mda+Da</i> %	<i>Mda+Da</i> %	<i>Mda+Da</i> %
13. What flipped classroom element(s) was/were more useful? Tick with an <b>X</b> the degree of agreement from <i>I strongly agree</i> (4) to <i>I agree</i> (3), <i>I agree to some extent</i> , and (2) <i>I hardly agree</i> (1)	1. Having more time to interact with the Teacher	88.90	100	60.00	50.00	74.73
	2. The freedom to work at my own pace	88.90	85.80	60.00	50.00	71.18
	3. Thanks to it, I always managed to complete and deliver all my tasks in time	66.60	57.10	60.00	75.00	64.68
	4. It gave me more chances to ask questions in class	55.50	71.50	80.00	50.00	64.25
	5. It kept me more engaged during class hours	88.90	71.40	60.00	25.00	61.33
	6. It gave the teacher more time to display specific skills	88.90	85.70	60.00	100	83.65

Note. *Mda*: I strongly agree, +: addition sign, *Da*: I agree

All the students validly answered the Likert-type questions in which they could only tick the values *I strongly agree* (4); *I agree* (3); *I agree to some extent* (2); or *I hardly agree* (1).

<sup>a b c d e</sup> The percentage of the average value for the valid items is presented with the result of *I strongly agree* (4) and *I agree* (3).

Likewise, the families perceived a high degree of acceptance among their children towards the utilization of the FL model. Thus, 83.33% of relatives claimed that students never complained at home while they were working under the FL model (see Figure 2).

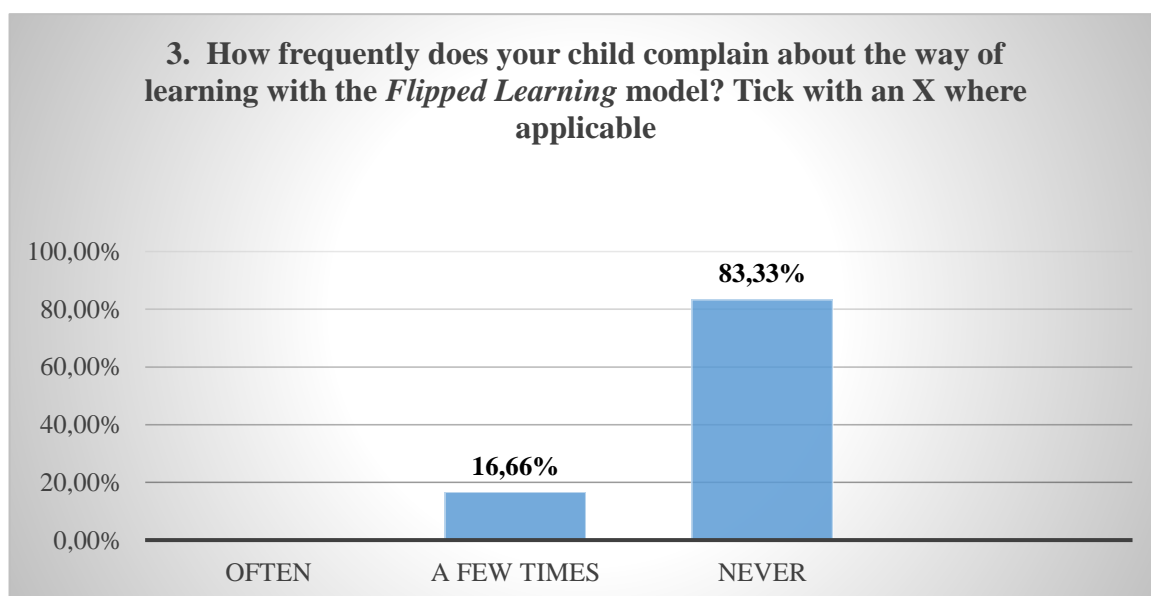


Figure 2. Frequency with which students complained to their families about using the FL model



Concerning the qualitative results obtained by means of discussion groups, they also reveal a high level of acceptance for the FL model by the interviewees from all four cases and their families. This corroborates the outcomes drawn from the quantitative analysis of the final questionnaire in this first objective.

The most significant coincidences between students and families in their respective discussion groups in this regard referred to the fact that both groups mostly had a positive view both about the use of the FL model in the subject and about its potential utilization in other subjects. As a sample of the results, we have chosen the data collected and brought together around the following two general themes: “1. General opinion about the use of the FL model in the academic year” and “2. Relationship between the learning achieved under the FL model and its potential utilization in other subjects” —all of them associated with TAM’s perceived usefulness variable. This led to a set of recurrent inferential codes such as “1.1 Positive perception” and “2.1 Useful learning, albeit conditional depending on the type of subject”, present in both cases, of students and families alike. A number of illustrative text segments can be found below:

*For me, I loved the Flipped experience... it is very positive*  
(1<sup>st</sup> ESO student, 12-to-13 years old)

*It depends on the subjects ... I mean, music is something that can be explained once and you take it in, but in Valencian language, I don't think so...* (2<sup>nd</sup> ESO student, 13-to-14 years old)

*... Well, I do see it as useful... because, since there are few of us, we learn more than usual* (3<sup>rd</sup> ESO student, 14-to-15 years old)

### *3.2. Benefits and limitations of the Flipped Learning model*

The analysis of the second objective in relation to identifying possible benefits and limitations in the teaching-learning process based on the *Flipped Learning* model provided positive results on a quantitative basis and only showed advantages. For that purpose, we will highlight the outcomes corresponding to item 20 —belonging to the Learning block— in the final questionnaire of a structured nature and with multiple-choice answers. Thus, 75.32% on average of the interviewees in all four cases claimed that they had not found any noteworthy barriers with FL learning. These were the percentages for each case: 55.6% in 1<sup>st</sup> ESO; 85.7% in 2<sup>nd</sup> ESO; 60% in 3<sup>rd</sup> ESO; and 100% in 4<sup>th</sup> ESO.

Similarly, students’ families also perceived benefits linked to working under the FL model in the classroom. Special attention must be paid here to the results obtained in the open-ended item 4 of the final questionnaire for families about the advantages that they associated with learning through the FL model —within the Learning block too. Among the benefits stand out the following: FL can adapt to different learning paces; FL makes it easier to achieve an entertaining and reliable type of learning in which contents are available wherever students need them and at any time; it is initially possible to work with the contents prior to attending class, which in turn allows the teacher to dedicate lesson time to clarifying doubts or solving problems. Examples thereof can be found in the text segments provided below:

*... each student can follow their own pace and it adapts to the moment when the student has the best predisposition* (52-year-old mother)

*...learning is guaranteed to the same extent as in the “classical” model and this one is much more entertaining (52-year-old father)*

*...having access to lessons at any hour (49-year-old mother)*

*... being able to dedicate the class with the teacher to clarifying the doubts that they may have had (45-year-old mother)*

Nevertheless, families do perceive some disadvantages. In this regard, it will prove helpful to examine the results corresponding to the open-ended question 6 of the final questionnaire for families —also belonging to the Learning block— in which the latter were requested to specify the drawbacks that they linked to learning under the FL model. More precisely, they highlighted the difficulty involved in clarifying the potential doubts of students regarding out-of-the-classroom access to contents, the expense associated with technology acquisition and maintenance, as well as the excessive amount of time spent by students in front of screens. The following text segments may serve as examples:

*...solving the doubts that students may eventually have (49-year-old mother)*

*...technology. We would have to upgrade home computers more and more, families would face greater expenses and spending many more hours at the computer is very harmful to children (43-year-old mother)*

*...the only problem is that if some families or children don't have internet access or the adequate technology available at home, they will probably feel bad (45-year-old mother)*

As for the qualitative results obtained by means of discussion groups, it deserves to be highlighted that neither the students nor the families were very active in the group debates about this topic. In students' discussion groups, codes were only generated for 1<sup>st</sup> ESO and 3<sup>rd</sup> ESO, and regarding families, we checked that not all parents/guardians were able to generate text and meaning units on an individual basis.

With regard to advantages, no relevant coincidences appeared between students and families in the respective discussion groups. Even though students did not generally provide text units which highlighted an advantage, their families did stress how advantageous it was both to be able to cultivate the different types of learning and to foster various types of memory, among them the visual one, thanks to the use of videos.

Concerning disadvantages, among students, only one participant in the case of 3<sup>rd</sup> ESO considered that the increased workload at home was negative. Families referred to some drawbacks related to aspects such as economic cost and health risk, thus confirming a part of the results obtained in the questionnaires for families. They also highlighted as disadvantages: on the one hand, the investment and expense that the technology needed to work with FL would mean for families and, on the other hand, the potential side effects on students' health derived from the excessive use of screens.

As a sample of these results, we have selected the data collected and brought together in the general themes “1. Advantages about the utilization of the FL model in the academic year” and “2. Disadvantages about the utilization of the FL model in the academic year”. This resulted in a series of recurrent inferential codes such as “1.1 Positive perception” and “2.1 Negative perception”, with presence in some cases, of students and families alike. Examples are provided through the text segments collected below:

*...and then each one has their own way of studying, one is more visual, another ... it is a complement (relative-mother)*

*...I mean, it is the future (relative-mother)*

*...the cost for the family ... because that technology, you have to upgrade it permanently; for instance, we have a computer at home, but it doesn't have a webcam, it is ... it is already outdated ... and next year we will be forced to buy a computer because you have to follow their pace; and then the children's eyesight gets damaged too ... because doctors are saying it, that children's health is suffering more and more (relative-mother)*

*... it depends on the things; in my case, for example, for reading I prefer a traditional book ... because these children with so many computers and so much time dedicated to all that, they are doing serious harm to their eyes (relative-father)*

#### **4. Discussion and Conclusions**

An analysis was performed in this study about the perception among students enrolled in the four years of the Compulsory Secondary Education stage and their families regarding the use of the FL model in the subject «music» within a rural environment. For this purpose, we used the Technology Acceptance Model (TAM), taking “perceived usefulness” as a variable or indicator. The rural context in which the educational center was located led us to use a methodology with a mixed descriptive approach based on the design of a collective case study, in which an attempt was made to answer a number of research questions rather than confirming hypotheses.

Concerning the first research question referred to the satisfaction of students and their families in their music learning with the use of ICTs from the FL model, the results enabled us to check that both the students themselves and their families had a positive opinion. Both groups felt satisfied with the work carried out during the research period, which matches the findings of other previous research studies, such as those authored by Calvillo (2014) and Smith (2015). In this sense, it is worth highlighting that perhaps one of the strengths of this study lies in the fact that we managed to obtain that joint vision of students and families, thus listening to the voices of both groups (Bond, 2020; Marín-Suelves et al., 2020).

In particular, students' results were positive and revealed a high degree of satisfaction and technological acceptance towards the utilization of the FL model. On the whole, this outcome coincides with the one achieved by López et al. (2019), although these scholars actually focused on teachers. This group lists as benefits brought by FL the improved autonomy, participation, interaction, and motivation of students, alongside their own satisfaction, aspects which have also surfaced in our results.

Breaking the findings down by cases, we can say that the level of satisfaction was higher in 1<sup>st</sup> and 2<sup>nd</sup> ESO. In relation to 4<sup>th</sup> ESO, it must be highlighted that, just like in other previous studies, including that of Smith (2015), some results about Satisfaction turned out to be contradictory. Thus, about half of the group expressed their disagreement in relation to the possibility of incorporating the FL work model into the music class during the following academic year and, however, the whole group strongly recommended this model to their friends. Likewise, 75.33% of interviewees claimed that they had not found any noteworthy barrier with FL learning.

As for the second research question, which focused on the advantages and disadvantages perceived by students and their families in relation to the use of the FL model in the music classroom, it is necessary to stress that in both groups' opinion, using the FL model brings a number of advantages that can help students achieve effective learning. Likewise, and the same as in some preceding studies of this kind, among them the one undertaken by Smith (2015), one of the most important concerns or drawbacks that they associate with the utilization of the FL model is the potential technological issues as Graells (2000) highlighted too when he referred to possible disadvantages derived from ICT use as a whole. In our study, families emphasized the economic cost and investment needed to acquire, upgrade, and maintain the technological equipment that a learning based on the FL model implies, to which they added the risk of a digital divide that this entails. This last aspect had equally appeared among the findings of Mengual-Andrés et al. (2020), according to whom family context stands out as the most influential variable when it comes to FL based learning. Families additionally expressed concerns about health due to the continued use of computers and, consequently, the number of hours spent in front of the screen, which matches the results obtained by Briones et al. (2020). Such concerns were also mentioned in other research works, including those of Gómez et al. (2021) and García-Umaña and Tirado-Morueta (2018), though in relation to different contexts.

In conclusion, our study attests that both students and their families feel satisfied with the use of FL and see no great obstacles for its implementation beyond in the case of families regarding the economic investment in technology and the health issues associated with the overexposure to digital screens as possible hindrances.

Finally, attention needs to be paid to the limitations faced in this research. It is important to point out that its case study format makes it impossible to generalize any results. We cannot identify having developed the project in a rural area as a limitation. Students naturally engaged in FL and had no Internet-access-related problems whatsoever to watch the online materials at their homes. Nonetheless, for future studies developed in contexts of similar characteristics, access to the Internet ought to be a key issue when designing the research. Hence our decision to administer an initial questionnaire (pre-test) in this study, exclusively seeking to detect potential problems concerning regular access to digital technologies and Internet connectivity outside the educational center. Should it have been necessary, the already foreseen solution was for students to watch the videos during the school day taking advantage of the center's connectivity and the possibility to use the tablets and desktop or laptop computers available at the library and the computer room.

Hopefully, this work will serve as a stimulus to continue working in future studies referred to active methodologies based on ICT use and the FL model for music learning in rural environments. Likewise, it can provide a reference to extrapolate the approach proposed to other educational contexts and levels related to music learning.

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