

ON THE MOVE: MUSIC AND ENGLISH TOGETHER LEAD TO EFFECTIVE CLIL

EN MOVIMIENTO: MÚSICA, INGLÉS, AICLE EFECTIVO

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Abstract

The present article reports on a study carried out with Primary Education students over a period of two consecutive years at a Bilingual state school in the Madrid Autonomous Community with a brief extension study in the third year. Our hypothesis was that the introduction of music in a CLIL context, where English was used, would enhance students' motivation and performance. The project design and its implementation included the composition of musical material with lyrics related to Natural and Social Sciences in English, the use of different research techniques and the measure of the results with several assessment instruments. The findings clearly validate the hypothesis, since learners not only improved their marks in the subjects taught in English, but their perceptions towards the teaching areas also got better as a consequence of the introduction of real songs especially composed to help learning the contents that were introduced on a regular basis during the intervention period.

Palabras clave: CLIL, English, music, Primary Education.

Resumen

El artículo presenta los resultados de un estudio llevado a cabo con estudiantes de Educación Primaria durante dos años consecutivos en un centro público bilingüe de la Comunidad Autónoma de Madrid con una breve extensión del estudio en el tercer año. La hipótesis de partida era que la introducción de la música en un contexto de AICLE, donde se usa la lengua inglesa, potenciaría la motivación y el progreso de los estudiantes. El diseño del proyecto y la implementación supuso la composición de canciones con letras en inglés relacionadas con Ciencias Naturales y Sociales, el uso de diferentes técnicas de investigación y la comprobación de los resultados mediante diversos instrumentos de evaluación. Los resultados claramente validan la hipótesis, dado que los estudiantes no solo mejoraron sus calificaciones en las asignaturas que se enseñaban en inglés, sino que su percepción hacia dichas materias también mejoró, gracias a la introducción de canciones de forma sistemática a lo largo de la intervención, compuestas como ayuda al aprendizaje de los contenidos.

Key Words: AICLE, inglés, música, Educación Primaria.

1. INTRODUCTION

This article presents the outcomes of an Action Research Project undertaken in the Madrid region at a bilingual state school to cater for the needs experienced by Primary Education students who studied

Natural Science and Social Science in English. To help pupils to learn new contents in English a special intervention plan was designed to be carried out during two academic years.¹

Since the so-called Bilingual Programme was implemented in the Autonomous Community of Madrid back in 2004, the Primary Education in English has been gaining ground steadily in Spain. The state programme was made extensive to the Secondary Education centres of the Madrid area in 2010. Thus, parents who wish to provide their children with opportunities for developing high levels of proficiency in a foreign language have an increasing number of school-based options at their disposal in this area, one of them being Content and Language Integrated Learning (henceforth CLIL). The concept underlying behind the label CLIL was defined by Coyle, Hood and Marsh (2010) as:

A dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language. That is, in the teaching and learning process, there is a focus not only on content, and not only on language. Each is interwoven, even if the emphasis is greater on one or the other at a given time (p. 1).

According to Lyster and Ruiz de Zarobe (2018), the content-driven programmes are aimed at developing higher levels of communicative ability. They also add that:

One of the most attractive features of CLIL and immersion programs is the increased exposure to an engagement with the target language. In addition to more time on task, the appeal of these programs lies in their capacity to enrich classroom discourse through substantive content, which provides a motivational basis for purposeful communication and a cognitive basis for language learning. For these programs to be effective, however, the conditions for their implementation need to be favorable, and these entail, on the part of teachers, engagement with a range of instructional practices considered effective for integrating content and language as well as opportunities for professional learning to nurture this engagement (Lyster & Ruiz de Zarobe, 2018, p. 273).

Besides creating a favourable environment with proper teaching practices that lead to effective learning, Pavón Vázquez (2018) adds that the focus of attention since bilingual education and CLIL were implemented has been on investigating, analysing and reporting “from several different perspectives, with attention normally being paid to four general dimensions: the policies behind these programmes, the outcomes, the language of interaction, and classroom pedagogy” (2018, p. 9).

In fact, since the CLIL approach has become widespread across Europe and particularly in Spain, a growing body of research has been carried out at different educational levels (Dafouz & Guerrini, 2009), in various regional areas (Lasagabaster & Ruiz de Zarobe, 2010) and with focus on all actors. Thus, the impact of bilingual education on L1 and content learning in monolingual settings on part of the students have been assessed (Pérez Cañado, 2018), but there are also studies on content-subject teachers and teachers’ training programmes (Halbach, 2010; Lasagabaster, 2014; Pérez Cañado, 2015).

¹ The data and findings presented here were part of Carlotta San Emeterio Bedia's Ph.D. thesis under the supervision of Isabel de la Cruz Cabanillas.

Likewise, a substantial number of scholars have shown the effectiveness of students' performance in terms of foreign language command both in Primary and Secondary Education (Jiménez Catalán & Ruiz de Zarobe, 2009; Pérez Cañado, 2011; Nieto Moreno de Diezmas, 2016, among many others). The research evidences that students who follow the bilingual programmes possess a significantly higher master of the foreign language. Notwithstanding, other authors underscore the fact that the students' performance in CLIL and non-CLIL programmes show no significant differences regarding the marks of those who study in the L1 and those who study in the L2 (Hughes & Madrid, 2019). Finally, some scholars, such as Anghel, Cabrales and Carro (2016), establish a direct correlation between students' performance and parents' educational level concluding that:

There is a clearly negative effect on the exam results for the subject taught in English, for children whose parents have less than upper secondary education. This negative effect is a composite of two phenomena: the effect of the program on the student's knowledge of the subject and a reflection of the student ability to do the test in their native language when English is the medium of instruction (p. 1202).

All in all, some of the issues raised above are beyond the scope of this article, which concentrates on the benefits that CLIL can have if combined with music. The idea has been explored partly by several authors. Thus, Cancelas Ouviaña and Cancelas Ouviaña (2009) discuss the convenience of using English as a vehicle for music learning, but the focus is on music rather than on the foreign language. In a similar vein, Rodríguez Merayo and Cebrián Bernat (2017) propose the combination of music, CLIL and Information and Communication Technology (henceforth ICT), but again the purpose is the improvement of bilingual Music education. It follows from here that there is still room for research within the CLIL context that has not been explored thus far.

Teaching and learning contents through English becomes a real challenge for both teachers and students in a setting where English is taught as a foreign language. To help students cope with the demanding task of having to process and memorise contents in a foreign language, San Emeterio Bedia and De la Cruz Cabanillas (2013) introduced music along with ICT as tools to motivate and facilitate students' learning process. This previous research confirmed how students' perception was improved, when these young learners realised that they could succeed in the Science area at school. Subsequently, students' attitude towards the content area taught through English became positive, affecting their performance in the same way. This is the reason why integrating songs seemed to be an excellent choice, since "music helps to improve abstract and spatial reasoning, foster positive attitudes and increase attention" (Anderson et al., 2002, p. 19).

Furthermore, Dale and Tanner (2012) consider Music as a subject a good field for learners "who are new to CLIL, since new language is introduced in a clear context with visual support or physical reinforcement" (2012, p. 72). Several other authors regard music as a candidate to implement CLIL. One of them is Willis (2013), who reports on an experience with very young children where music was used to teach English. In this vein, Torras Vila (2021) advocates for the combination of music and English to show the benefits that this binomial can bring to foreign language classrooms with young

learners. Her aims are to provide a theoretical framework to use music in foreign language teaching and to highlight “the need to develop and implement CLIL Music approaches” (Torras Vila, 2021, p. 36).

In addition, Gardner (1999) contemplates music as a special kind of intelligence. He states that “musical intelligence entails skill in the performance, composition and appreciation of musical patterns. In my view, musical intelligence is almost parallel structurally to linguistic intelligence, and it makes neither scientific nor logical sense to call one (usually linguistic) an intelligence and the other (usually musical) a talent” (1999, p. 42). Therefore, music cannot only benefit students regarding motivation and positive attitude towards the contents, but also in terms of language improvement and brain development. For instance, Mizener (2008) contends that musical activities reinforce many aspects of language development, since singing, rhythmic speaking and listening are all experiences that support language development (2008, p. 11). In fact, there seems to be an intimate relationship between language and music from a neurological standpoint. This claim is supported by Koesch’s study (2005) which contends that:

The human brain processes music and language with overlapping cognitive mechanisms, in overlapping cerebral structures. This view corresponds with the assumption that music and speech are intimately connected in early life, that musical elements pave the way to linguistic capacities earlier than phonetic elements, and that melodic aspects of adult speech to infants represent the infants’ earliest associations between sound patterns and meaning, and between sound patterns and syntactic structure (p. 211).

Bearing in mind the previous research on the topic, our hypothesis was that the introduction of music in a CLIL context, where English was used, would enhance students’ motivation and performance. In addition, this project takes a further step ahead from previous ones, since three areas are integrated: English as the language of teaching which helps to reinforce students’ knowledge of the foreign language; learning of Natural Science and Social Science through English; and besides, music, thanks to children’s appreciation for it, which will be used as a motivating element to acquire new concepts in a foreign language. Another key aspect of the project is the fact that the materials were designed by a piano teacher, who is also an English teacher. She composed a whole series of songs with unique pitch, different rhythm structures, chords and lyrics for each unit. Likewise, rather than being a short experiment, the plan was developed during two academic years with a short extension in the third year.

2. RESEARCH DESIGN AND IMPLEMENTATION

2.1. Sample

The state school where the intervention plan took place is located in the urban area of Torrejón de Ardoz. The socio-cultural level of the students’ families attending the school ranges from low to middle class, from a wide variety of cultures. At the moment of the intervention, 670 students were enrolled, out of whom 203 were foreigners. Regarding the places of origin of the latter, most of them were from Africa, Eastern Europe, South America and Asia (specifically from Morocco, Nigeria, Poland, Romania, Ecuador, Honduras and China). Therefore, learners came from very different backgrounds, previous

experiences at school, knowledge and expectations. Despite the humble origins of some families, all students who took part in the research had computers at home, which proved to be useful to carry out the intervention plan properly.

The school has been involved in the Bilingual Programme of the Autonomous Community of Madrid since 2005, and therefore the Science area (Natural Science, History and Geography), which is currently divided in two areas (Natural Science and Social Science), was taught in English at the time the research took place. This language became students' second or third language in some cases. Even if most students had been exposed to the English language since they entered school, when they were three years old, the increasing number of contents in English made learning difficult on some occasions. If teachers usually find teaching contents through English challenging because of students' diverse backgrounds, interests and needs, the task is even harder when English becomes students' third language. According to the data compiled for this research, the students' provenance and language of origin explain the difficulties many of them encountered to follow the subjects taught in English.

At this school, courses from pre-Primary to Primary had two classrooms with an average of 25-26 students per class. A previous attempt to introduce music and ICT in the CLIL context was carried out during the academic year 2011-2012, with students behind their expected curricular level and the intervention plan turned out successful in terms of students' performance in English and regarding their motivation to learn new contents in a foreign language (San Emeterio Bedia and De la Cruz Cabanillas, 2013). For this specific research, the data were collected during two academic years. The first period was a pilot study with a group of 42 students, out of whom 20 were boys and 22 girls in their 6th Year of Primary Education belonging to two different classes. The second one was the proper target study, with a group of 64 students, out of whom 31 were boys and 33 girls in their 5th Year of Primary Education distributed in three classes. This research continued with an extension study the year after. In all the cases the students presented the general characteristics previously described and were taught by the same teacher using the same methodology at the designed periods of time.

2.2. Materials

Unlike other courses where the creations lack proper musical techniques and tend to be simple tunes with easy content-related messages, for this research the songs were systematically planned and worked on taking into account music criteria. Thus, original musical scores (written music) were composed by Carlotta San Emeterio Bedia for the didactic units of contents in the Natural and Social Sciences fields. Some of the titles are: *Among flowers* (The Plants Kingdom Didactic Unit), *In the Milky Way* (The Universe Didactic Unit), *Who is eating who?* (The Biosphere Didactic Unit), *What I need* (Europe Didactic Unit), *It doesn't matter!* (Atoms Didactic Unit), *Archimedes knew how* (Matter Properties Didactic Unit), *Light me up too!* (Light Didactic Unit), *Electrify me, baby!* (Electricity and Magnetism Didactic Unit) and *Trick or trade* (Economy Didactic Unit).

The music was created chiefly by means of a piano and a keyboard. Before writing the music and the lyrics of the songs, the idea was to frame the compositions in the pop style, but other genres came up during the creation process: Reggae, disco, rock and roll, and blues. The compositions were

completed with instrumentation to make them more significant and appealing to students, once the scores were ready. The final songs² were produced using Reaper®. For its instrumentation VST plugins were used. The project was ambitious, since it demanded complete dedication on the part of the composer. Instrumental arrangements were developed with the assistance of Tomás Enrique Varela Sanz.

Through songs, students would internalise the contents of each unit. The most relevant fact here is that, from the very beginning, compositions were conceived not to be a reproduction of the textbook contents with musical background, but real songs with meaningful stories composed by the teacher.

2.3. Instruments

A wide range of instruments were used to assess firstly, the students' dominance of musical intelligence, secondly, their academic performance and thirdly, their motivation and perception towards the areas involved.

Before analysing students' performance, during the target study we determined which students showed dominance of the musical intelligence (Gardner, 1999) to check if this fact could affect their results too. In order to do so, every student took the online test of multiple intelligences on the Psicoactiva site.³ Figure 1 shows a screenshot of this multiple intelligences test by Psicoactiva, which is a Spanish website whose contents are in Spanish. Despite this fact, most of the self-reflection tests that students took during this research were bilingual (English-Spanish) or in Spanish mainly to guarantee honesty and open answers when possible. This was an issue we discussed about widely and of paramount importance, since we tried to avoid the loss of important information because of the lack of proper command of the foreign language vocabulary. Some samples can be seen at the end of this article in Annex II (songs questionnaire) and Annex III (self-reflection about personal performance, appreciation of the area and music influence). Obviously, lessons were in English and the specific knowledge of curricular contents and songs were always tested in English.

Inicio del test

1 Tengo buena memoria para los nombres de lugares, personas, fechas y otras cosas aunque parezcan triviales.

Sí

No

2 Me gustan los juegos de lógica.

Sí

No

3 Me cuesta hacer dibujos de figuras para que se vean como en tres dimensiones.

Sí

No

Figure 1. Multiple Intelligences test by www.p psicoactiva.com

² Voice and instruments were recorded by Carlotta San Emeterio Bedia and T. Enrique Varela, and some of them are available at www.carlottasebedia.com.

³ <https://www.p psicoactiva.com/test/educacion-y-aprendizaje/test-de-las-inteligencias-multiples/>

After students completed the test, a diagram with their results was made available to them.



Figure 2. Multiple Intelligences test results by www.psicooactiva.com

Regarding student's performance and prior to the intervention procedure, students' academic files and previous years' marks were examined in their official files at school, since they had at that time different teachers and probably different methodologies too. These results, along with their performance in the non-intervention process part, would be compared with their outcomes at the end of the intervention plan. To do so, specific content tests, self-assessment questionnaires, exercises, opinion surveys, etc. were also developed to assist the data gathering process. An example is displayed for clarification purposes at the end of this article (Annex I).

With reference to the contents themselves, the testing procedure consisted of a set of twenty multiple choice questions for each of the topic units. These tests were all similar both, for the control and intervention stages. At the end of the content part and in the same test, student had a self-assessment part to reflect on their performance and preparation at home. After the intervention in each didactic unit, we also tested whether students knew the lyrics with activities such as "fill in the gaps" or "reorganise scrambled verses". Then, we would be able to establish a clear relation with the content-tests results.

Finally, students were tested periodically to assess to what extent music helped them to acquire contents through a foreign language and to improve their academic results in comparison with the previous year.

2.4. Data collection

As for the structure of the project, three different phases can be distinguished: Phase 1 was a pilot study that took place during the academic year 2013-14 with a sample of 42 students in Year 6 of Primary Education. In this pilot study some of the songs and the questionnaires were tested, and we analysed the results to obtain new data. This served to test the validity of the methodology and the suitability of the songs.

In turn, Phase 2 consisted of a second intervention that happened in the following year with 64 students in Year 5 of Primary Education. This was the target study of our research, whose results were analysed again. In both cases, in the pilot and target studies, during the first term there was no introduction of songs with contents related to the Science areas, whereas the intervention took place during the two other terms of each academic year. Finally, once we drew some conclusions and, even though it was not part of the original project, in the academic year 2015-16, we implemented an extension study, using some of the songs again in several isolated didactic units with 42 students in Year 4 of Primary Education and at a different school, to have a more general perspective testing once again the methodology and comparing the results obtained in the target study with the new ones. This was considered the third phase of the research.

Facing long-time research like the one presented here becomes a real challenge, since covering such an extensive period cannot be free of unforeseen events. We encountered mainly two difficulties during our investigation. Firstly, there was a change in the curriculum that affected this research by means of organisation: The enactment and subsequent implementation of the LOMCE (Organic Law 8/2013, 9th of December, for the Improvement of the Quality on Education) turned the Science Area into two distinct courses: Natural Science and Social Science. This fact implied that, once the pilot study had finished, tests and questionnaires had to be adapted to the two areas. Secondly, this project was originally thought to be developed during two consecutive academic years in Year 6 of Primary Education, but unfortunately, the teacher who carried out the pilot study with the 6th-Year students was not given the chance to continue her target study with other students in the same grade the following year. This is the reason why the target intervention was carried out with students in the 5th Year of Primary Education. Therefore, all the techniques and materials were designed for 11-year-old learners and one area in the case of the first phase, and adapted to 10-year-old learners and two areas in the case of the second phase. This change turned out to be advantageous to test the methodology in different school years with independent students, showing that it worked well regardless of the students' age or the complexity of contents.

The initial design of the study included non-intervention techniques at the beginning of each academic year, checking students' previous knowledge of the subject contents and observing their performance in the first topic units of the course. The second step was the implementation of the project to be tested using songs as a vehicle to introduce contents, measuring students' performance, and obviously, gathering data for further analysis. Thus, the same groups of students experimented both the non-intervention and the intervention procedures each year of the research. This applies to the pilot study, as well as the target study and the brief intervention in the extension study during the third academic year. Overall, the intervention was carried out with a sample of 148 students (42 in the pilot study, 64 in the target study and 42 in the extension year).

If we concentrate on the project itself, once the non-intervention part was finished and, before starting the first didactic unit of intervention, students had a brief tutorial to introduce them to the new methodology. The course was divided into different topic units. On a regular basis, content units consisted of two weeks of work. When the didactic unit content required more than two weeks of work,

the central part of the scheme presented in Table 1 was extended, repeating the days of work in steps 2 and 3 (content lessons) as needed.

WEEK ONE	Step 1	<i>day one</i>	<p style="text-align: center;">MUSIC CLASS</p> <p>Presentation of the song on the first day of the work unit in class in two stages:</p> <ol style="list-style-type: none"> 1- <u>Just the music</u>: Internalization of instrumental melody, rhythm (phase, periods, pauses, rests, metronomic aspects); tone, modulations; identification of the chorus, retarding, crescendos and diminuendos; etc. 2- <u>Introduction of the lyrics</u>: Vocal melody (diction, pronunciation), harmony (height of pitch, polyphonies); rhythm beat (emphasis and pulse), metronomic aspects, syncopated notes, etc. <p>Access at home: Students have the song in mp3 format; score and lyrics uploaded on the teacher's website.</p>
	Step 2	<i>days two, three & four</i>	<p style="text-align: center;">CONTENT LESSONS</p> <p>Introduction of contents from the lyrics' sentences.</p> <ul style="list-style-type: none"> - Classwork on contents as usual: Worksheets, explanations, workshops, experiments, group projects, etc. - Listening and singing of the song.
WEEK TWO	Step 3	<i>days one, two & three</i>	<p style="text-align: center;">CONTENT LESSONS</p> <ul style="list-style-type: none"> - Classwork on contents as usual: Worksheets, explanations, workshops, experiments, group projects, etc. - Listening and singing of the song. At the end of the lesson, questions-game to check students' understanding of the song lyrics and topic contents.
	Step 4	<i>day four</i>	<p style="text-align: center;">EVALUATION PROCEDURES</p> <ul style="list-style-type: none"> - Students assessed by the teacher in diverse ways: First, checking if they knew or did not know the song. Then, content testing techniques: Multiple choice tests, oral questions, etc.). - Students' self-assessment by means of questionnaires. - Teacher's procedures and work assessed by students and by means of a survey.

Table 1. Intervention procedure scheme

As can be seen in Table 1, the methodology was very structured and controlled for the purpose of the intervention. In *step 1*, the lyrics and music were introduced to the students. In *step 2*, the contents were introduced using as a starting point the lyrics of the song. For example, for content unit *Electricity and Magnetism*, whose test can be seen in Annex I, we composed the song *Electrify me, baby!* If we observe its lyrics, its verses would help, firstly the teacher in class, as a starting point to explain the contents and secondly, the students to internalise the message of those sentences too, since they had already a previous contact with its rhythm and message from *step 1*. The verses for *Electrify me, baby!* are the following:

- You are pure energy, a source of self-esteem
- Power me, oh my friend, this is what I need.
- We are opposite poles; we have opposite charges. Never mind, this is good: You attract me like a magnet.
- I'm feeling sick I'm tired, electrify me with your healthy madness.
- We move towards each other. Power me I'm getting to you.
- I touch you; you electrify me.

Step 3 would cover the classwork with the teacher’s methodology: projects, oral presentations, group work, cooperative work activities, etc. And *step 4* refers to the assessment procedure mentioned in 2.3.

3. RESULTS AND DISCUSSION

3.1. The influence of the musical intelligence

From the analysis of the multiple intelligences test that students took, we obtained the following results: Out of the 64 students taking part in the project, 11 of them revealed themselves with the musical intelligence highly developed, and only 2 students had it as dominant. This means that prior to our intervention we could have considered that 20.31% of our students were going to be benefited from the use of music in CLIL class. Nevertheless, after the intervention took place, the results showed that several of these students also failed some of the tests and exams, while, in general terms, 70.31% of the whole group improved their results with reference to previous years. This is an interesting fact from a teaching perspective, because the outcomes of the research established that not only students with musical intelligence dominance were influenced in a positive way, but also the rest of the group.

3.2. Findings

The analysis of the performance results made clear that failure in the subject area decreased in a very significant way: The number of students failing their subjects after the music intervention was reduced meaningfully both in the pilot and in the target studies. Thus, we had a reduction of 56.71% in Science after the pilot study intervention; and a decrease of 31.73% and 21.96% in Natural and Social Sciences respectively, after the intervention in the target study. This can be observed in Figure 3.

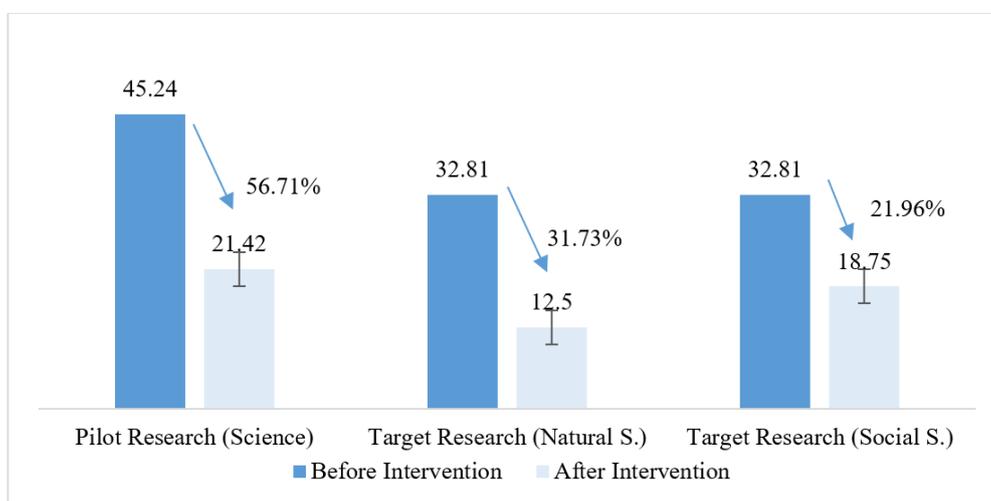


Figure 3. Reduction of failure after pilot and target studies

3.2.1. Results after the intervention in the pilot study

When checking the students’ academic performance, their marks compared to previous years were not too relevant in the non-intervention part of the process. This fact was interesting, since students had a

new teacher with a different methodology from the former one. On the contrary, once the intervention started, there was an important difference, since a remarkable improvement in the students' outcomes was evident. Figure 4 shows the progress in CLIL Science in the pilot study (42 students in two groups).

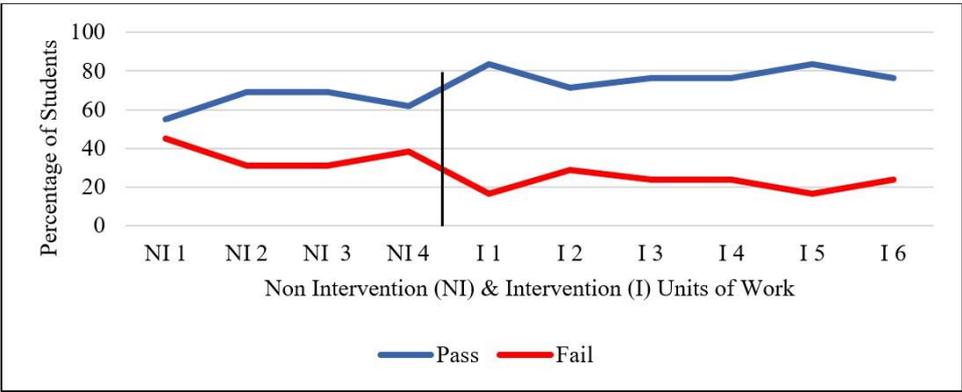


Figure 4. Pilot Study

The horizontal blue line represents the students passing the subject and the red line the ones that failed it. The vertical black line marks the moment when the intervention started. It can be observed that the first didactic unit of the intervention (I1) experienced an interesting increase in good results (over 80% of students passed). Then, it settled and maintained a steady upward tendency in success.

3.2.2. Results after the intervention in the pilot study

This positive tendency observed during the pilot study was extended to the target study (64 students in three groups), in which once the intervention started, results improved. The results can be seen in Figure 5 (for the Natural Science area) and Figure 6 (for the Social Science area).

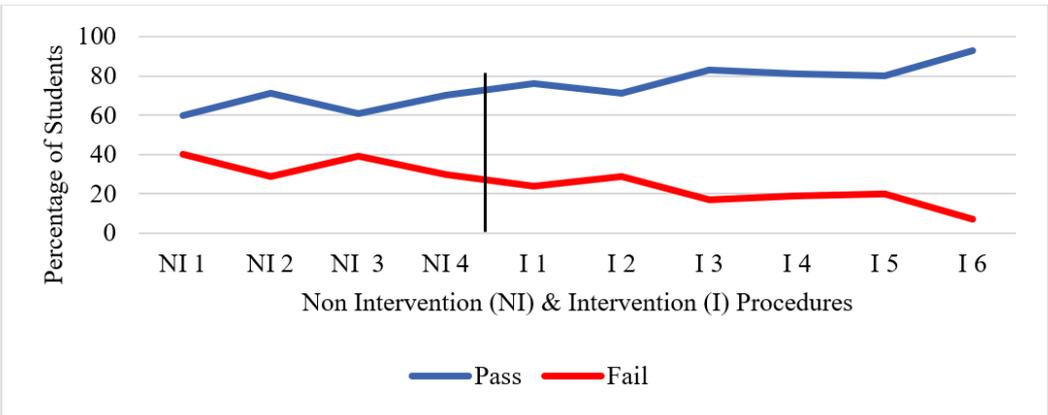


Figure 5. Natural Science in the target study

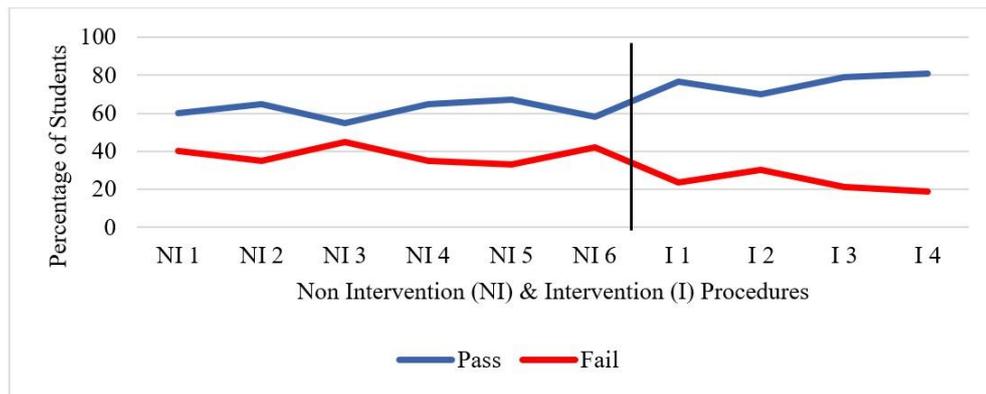


Figure 6. Social Science in the target study

During the target study intervention period, a downward tendency regarding failed tests and exams by students is observed and, accordingly, an upward tendency in succeeding them. Both figures show the independent areas with all the non-intervention and intervention units as separated ones, but in actual practice, both areas were interwoven because they were taught in the same periods of time and by the same teacher.

We examined the individual results that students got in their tests and exams and reflected on their self-assessment questionnaires. As these students expressed in the questionnaires, their appreciation and motivation for the area was increasing: During the pilot study, in the non-intervention units, 75% enjoyed lessons or liked them, while in the intervention units, 90% did. During the target study, in the non-intervention units, 87% enjoyed lessons or liked them, whereas in the intervention units, 95% did. These results confirm a more positive assessment and enjoyment of the area almost since the beginning of the intervention plan. Likewise, at the end of the target study, students took a questionnaire to reflect on their own learning process regarding this intervention. All students liked and enjoyed the use of songs in CLIL lessons. In fact, 98.44% had the feeling that the link between songs and contents was a source of motivation to study the content area; 96.88% considered the songs-content units helped them to understand the contents better (considering that we had introduced those contents through the lyrics of the songs); and 95.31% expressed they preferred those didactic units with songs rather than those without them. In general terms, students were motivated and enthusiastic about their work with and through the songs. Similarly, they appreciated having good music instead of simple chants. They also expressed their zest for the messages of the songs, not just as a reproduction of contents with musical background but as authentic stories connected to real life and experiences.

By the end of the academic year (June), a great improvement in the attitude when facing contents through English as well as in students' progress could be observed. In Figure 7, the outcomes of the target study are shown. The students' marks in the previous academic year (Primary 4, having just one area: Science), as well as the results they got in the target study year, in June (Primary 5, having two areas for the same contents: Natural and Social Sciences) can be seen.

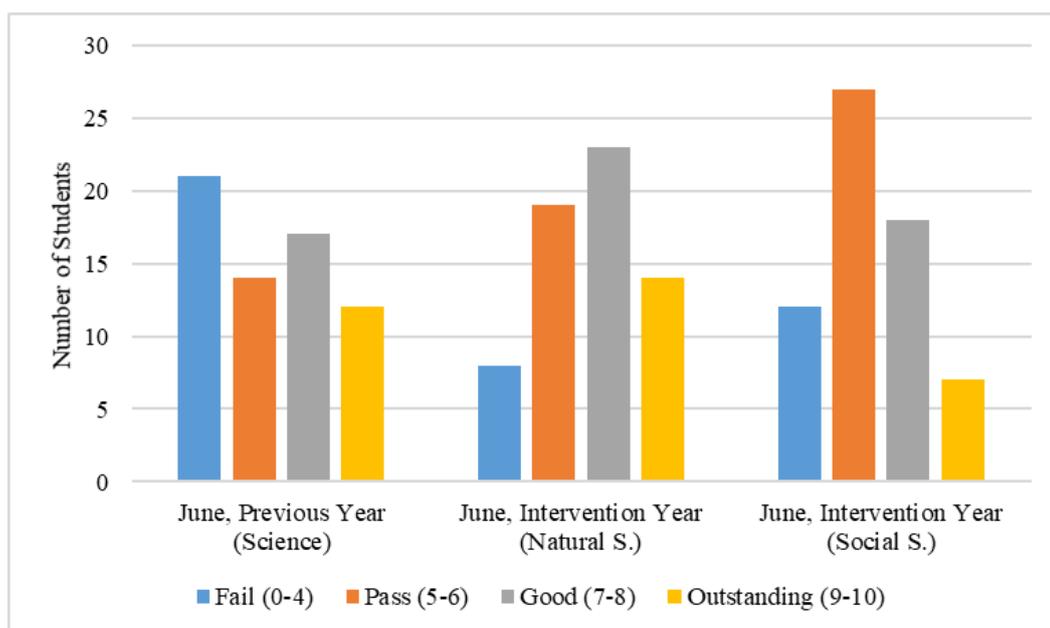


Figure 7. Target study in perspective: Students' marks

Focusing on the blue column, the reader can see that from 21 students failing the single area in the previous year, only 8 did it in Natural Science and 12 in Social Science by the end of our target study. The average of the results between the two new areas compared with the marks in June 2014 is conclusive: Improvement in marks and understanding of the contents is experienced in the results beyond any doubt. Consequently, the intervention had a direct impact on the number of students passing the content area with 5 or 6 out of 10 (column *pass*), and with 7 or 8 (column *good*). Furthermore, the reasons that account for several students failing the subjects could be related to the lack of study time at home when they had to get ready for a test or exam. Although these students had failed the area in the previous years too, they were able to perform good tests, exams and exercises in some of the content units during the intervention, but not in most of them. This suggests that music was working well for them in a CLIL context, but it was not enough to compensate other personal and social circumstances which did not facilitate their assimilation of contents.

Another noticeable fact was that the students who showed the greatest improvement were those with the worst results in the previous years. As mentioned before, 70.31% of the students in the target study had improved their final outcomes. This implies that the other 29.69% kept their records at a similar level. Out of that 70.31% of the students who improved, 31.25% were not successful in passing the subject in the previous year. These students experienced developments that were quite significant in some cases. In Figure 8, the data can be consulted in a detailed and individualised way:

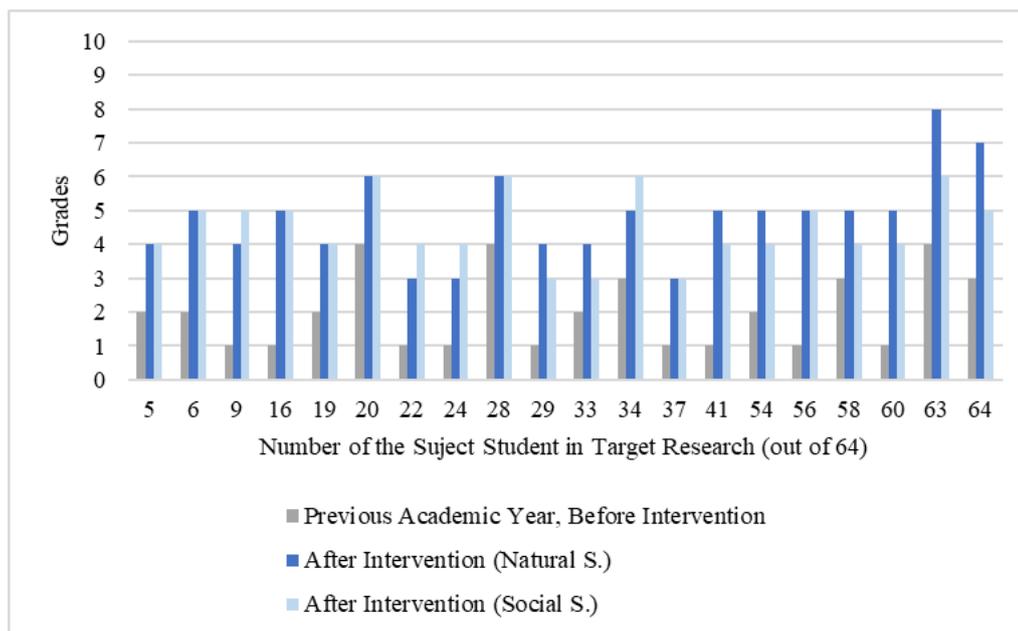


Figure 8. Improvement in students with failing marks

Not all students who were low achievers were able to pass both areas, but the improvement is clear. If we have a look at students number 9, 16, 41, 56 and 60, we can see how they raised their marks. Three of these students kept failing one of the content areas with a mark of 4, but they succeeded in the other content area with a mark of 5. Coming from mark 1 out of 10, their progress (3 to 4 points) was remarkable. The other three students passed both Natural and Social Sciences. All in all, students number 5, 19, 22, 24, 29, 33, 37 were not able to succeed in any of the content areas by the end of the target study period. Even though they also experienced an upgrade, it was not enough to succeed academically. Anyway, this cannot be considered a setback in terms of our investigation since, all of them improved in 2 or 3 points.

Students 20 and 28 obtained a mark of 6 in both areas. Nevertheless, this meant an improvement of just 2 points with reference to their previous results. This progression was less significant than the students mentioned above. On the contrary, the performance of subject students 34, 63 and 64 is noteworthy. Student 34 gained 2 to 3 points in the results, coming from a mark of 3 out of 10 and performing in one of the areas with 6 out of 10. Lastly, students 63 and 64, the most significant ones, scored better in 2 to 4 points. Besides, their improvement took them to get higher marks in one of the areas.

As a summary and for clarification purposes, out of 17 students coming with a mark of 1, 2 or 3 (out of 10), 6 of them (35.30%) passed both content areas; 6 (35.30%) passed one of them and the other 5 (29.40%) could not pass any of the areas but made good progress too (students number 5, 19, 22, 24 and 37 in Figure 8).

3.2.3. *Extension study*

By the end of the target study, we thought it would be interesting to test our methodology with a different group of students in a different context. During the academic year 2015-16, taking advantage of the fact that the teacher implementing this research moved to a different school, some of the songs were introduced in isolated content units to check whether the benefits in students' attitudes and results could apply in another school setting. We had two classes of students in Year 4 of Primary Education, with a final sample of 42 learners. The school was located in the same urban area of the same city, but most families attending this school were middle class. What we observed again was that students performed better when using songs to introduce the contents. They seemed more motivated and asked for songs in all the units both in Natural and in Social Sciences. Results improved in some cases but in most of them were alike, since these students usually scored well in their tests. Here again, the students failing the areas from the previous academic year were those who found more benefits in the implementation of songs with CLIL.

4. SUMMARY AND CONCLUSIONS

Having as a starting point previous research (San Emeterio Bedia & De la Cruz Cabanillas, 2013), in which two interventions were developed with music and ICT to help students behind their expected curricular level to acquire contents through English, we designed an Action Research Project to be carried out for over two years. Considering the difficulties many students find when learning contents through English, we set up two phases to implement it, each of which spread out over one complete academic year. The first one was a pilot study which tested the materials and the methodology. The second phase of the Action Research was the target study, the main objective of our investigation. In both phases, the fundamental aim was the implementation of music as part of the teaching practice in the Science area (Natural and Social Sciences). The project was undertaken with students in the third cycle of Primary Education (Year 6 and Year 5.) Both intervention plans have been explained and analysed in detail and both shed light on how music can help in the CLIL context. A further extension was developed at a different school, extending this project to a third academic year. Even though it was a brief intervention and, in another setting, the findings confirmed the results obtained during both the pilot and the target studies.

From the analysis of the data, the following conclusions can be drawn: Firstly, students obtained better academic results in content areas taught through English (being English a foreign language) when songs were incorporated to introduce the contents. This was true not only for learners with highly developed musical intelligence, but for all of them. Secondly, the students who benefited most from the project were those who were low achievers in the years prior to the intervention plan. Likewise, the use of music in CLIL lessons had a positive effect on their interest and appreciation for the content area as well. Thus, songs in CLIL contexts guarantee improvement in learning, since marks below 5 were significantly reduced both in the pilot and the target studies and made students get engaged with the academic topics, increasing their overall satisfaction with the course.

Most students were able to pass the subject areas, but what is even more important, they demonstrated understanding and integration of contents. In addition, students' perceptions towards the

subject areas were improved, as they felt motivated to learn the contents through music, which helped them to understand the concepts better. Songs were particularly welcomed, since they were real meaningful compositions in terms of lyrics and music. It can be concluded from here that the intervention was effective. The teacher's implementation of meaningful songs, not just as a reproduction of subject-contents, but as real stories which students could connect to real life, seemed to have a positive effect on the students' academic results, as shown in their evolution through the didactic units as well as in their final marks. Therefore, our hypothesis, which stated that music in CLIL would enhance students' motivation and performance, was validated.

Clearly, this methodology, which includes songs, affects students' enthusiasm and commitment towards content areas taught through a foreign language, in our case Science taught in English. Obviously, the outcomes can be due to several factors, such as the teacher's style, learning styles, students' personal characteristics, etc. Nevertheless, we have demonstrated that precisely the group of students who had more difficulties in the area and did not show musical intelligence dominance took advantage of the intervention with music in their classrooms. What is more, all students were greatly benefited from the use of songs and this technique in the intervention. It consisted of presenting the contents starting from different lyrics and verses of the songs, which proved useful to draw student's attention and to help them fix these contents and enjoy the learning experience.

To conclude, we can assert that including music in CLIL lessons can help students succeed, since they showed a really positive attitude towards both, the content areas and the English language. Music itself is another language, another tool for communication and, as a result of that, it is also a powerful and enormously motivational resource for young learners. Additionally, music has much to do with the way in which our brain works and integrates contents and, as Gardner (1999) claims, with the linguistic intelligence itself (1999, p. 42). Consequently, as CLIL teachers we should incorporate this element in our teaching practice on a regular basis. Leaving the comfort zone is a real challenge for students and teachers alike, but as Vygotsky (1978) states that we should be working always out of it, in the zone of proximal development,⁴ building up a beautiful CLIL scaffolding for students in our classroom. In fact, there is still room for investigating the use of music within the classroom in hitherto unexplored contexts. For instance, further research on how this CLIL methodology could benefit students with Attention-Deficit Hyperactivity Disorder would be desirable.

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⁴ The zone of proximal development has been defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, 86).

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Annexes

Annex I

Natural Science Sample Test UNIT 9 Electricity & Magnetism

DATE: _____

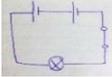
STUDENT'S NUMBER: _____

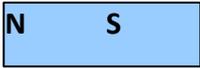
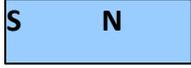
INSTRUCTIONS:

- ⤴ **DO NOT OPEN THIS TEST UNTIL YOU ARE TOLD BY THE TEACHER.**
- ⤴ **USE A BLUE PEN TO DO THIS TEST.**
- ⤴ **CIRCLE THE LETTER OF THE ANSWER YOU CHOOSE. IF YOU WANT TO CHANGE YOUR ANSWER, CROSS OUT THE PREVIOUS ONE AND CIRCLE THE NEW ONE.**
- ⤴ **WRITE YOUR PERSONAL NUMBER IN THE ESTABLISHED BOX.**
- ⤴ **IF YOU DO NOT KNOW AN ANSWER LEAVE IT BLANK AND CONTINUE WITH THE TEST.**
- ⤴ **READ CAREFULLY THE FOLLOWING QUESTIONS AND THE DIFFERENT OPTIONS YOU ARE GIVEN. CHOOSE WHAT BEST FITS THE ANSWER.**
- ⤴ **ONCE YOU FINISH, CHECK ALL YOUR ANSWERS AGAIN.**

IN (0-9) SF (10-11) BI (12-13) NT- (14-15)
NT+ (16-17) SB- (18-19) SB+ (20)

STUDENT'S RESULTS ___ / 20 → ___ IN SF BI NT- NT+ SB- SB+

1- When we rub two non-metals together, we create...		
a. Electrical current.	b. Magnetism.	c. Static electricity.
2- “All objects have electrical charge” This is...		
a. True.	b. False.	c. Magnetism.
3- An object with this charge: + + + + - - - - + + - - + + It has a...		
a. Positive charge.	b. Negative charge.	c. Neutral charge.
4- If an object has a neutral charge, this means that...		
a. It has the same number of positive and negative charges.	b. It is magnetic.	c. It conducts electricity and the bulb lights up.
5- If we rub two balloons against the same fabric,		
a. The balloons will have static electricity.	b. The balloons will repel each other.	c. Both “a” and “b” are correct.
6- An electric circuit is...		
a. A path that allows electricity to pass through it.	b. A battery that allows electricity to pass through it.	c. A wire that allows electricity to pass through it.
7- In a circuit, how does electricity move?		
a. Electricity moves from the north pole to the south pole.	b. Electricity moves from the negative terminal of the battery to the positive one.	c. Neither “a” or “b” are correct.
8- Electrical energy is converted into heat energy, light energy, sound energy and...		
a. Solar energy.	b. Magnetism.	c. Movement energy.
9- This symbols represent:		
		
a. (A) a bulb & (B) an open switch.	b. (A) a battery & (B) an open switch.	c. (A) a battery & (B) a closed switch.
10- This circuit has two batteries, one closed switch, one bulb and five wires.		
		
a. True	b. False, it has four wires.	c. False, the switch is open.
11- A material which electricity can flow through is called...		
a. An insulator.	b. Neutral charge.	c. A conductor.
12- A circuit has two bulbs, one closed switch and three wires. Will electricity flow through this circuit?		
a. Yes.	b. No.	c. Only if the switch is close.

13- A circuit has one bulb, one open switch, one battery and three wires. Will electricity flow through this circuit?		
a. No, because the switch is open.	b. No, because the switch isn't closed.	c. Answers "a" and "b" are right.
14- They are insulators:		
a. Cork, plastic, aluminum, rubber, fabric and wood.	b. Cork, plastic, glass, rubber, copper, fabric and wood.	c. Cork, plastic, glass, rubber, fabric and wood.
15- They help to control the flow of electricity through the circuit.		
a. Batteries.	b. Wires.	c. Switches.
16- Magnetism flows...		
a. From the east to the west charge.	b. From the south to the north poles.	c. Neither "a" nor "b" are right.
17- Which materials are magnetic?		
a. All metals and some natural minerals.	b. Certain metals, such as iron and mixtures of iron (steel).	c. Those that conduct electricity.
18- What happens if you break a magnet into two parts?		
a. It doesn't work anymore.	b. Only one of the poles works.	c. Each part will also have a north and a south pole.
19- What is going to happen with the following magnets?		
<p>A)   B)  </p>		
a. Magnets will repel each other in (A). and (B).	b. Magnets will attract each other in (A) and they will repel each other in (B).	c. Magnets will repel each other in (A) and they will attract each other in (B).
20- Auroras Borealis and Auroras Australis are related to...		
a. Earth's magnetic fields.	b. Earth's electrical circuits.	c. Earth's static electricity.

Annex II

QUESTIONNAIRE
Use of Songs in Natural & Social Sciences Class

Student N#: _____ Name: _____

1. Did you like using music in the Science classroom? Why?
(Te ha gustado utilizar la música en las clases de ciencias? ¿Por qué?)

2. Do you consider using songs helped you to score better in the Natural and Social Science tests?
(¿Consideras que haber utilizado canciones te ha ayudado a sacar mejor nota en los test the naturales y sociales?)

3. Of all the units we have worked on this year, do you prefer units with or without songs?
(De todas las unidades trabajadas este año, ¿prefieres las que tenían canciones o las que no?)

4. Did you understand the connection the teacher established between the songs and the units?
(¿Entendías la conexión establecida por la profesora entre las canciones y las unidades?)

5. Would you say that by making this connection it was easier to understand the contents?
(¿Dirías que al hacer esa conexión entre las canciones y las unidades era más fácil entender los contenidos?)

6. Would you say that by making this connection you were motivated to work on the units?
(¿Dirías que al hacer esa conexión entre las canciones y las unidades te sentías más motivado/a para trabajar en la unidad?)

7. Did you like the songs by *Henry & Carlight*?⁵
(¿Te gustaban las canciones de *Henry y Carlight*?)

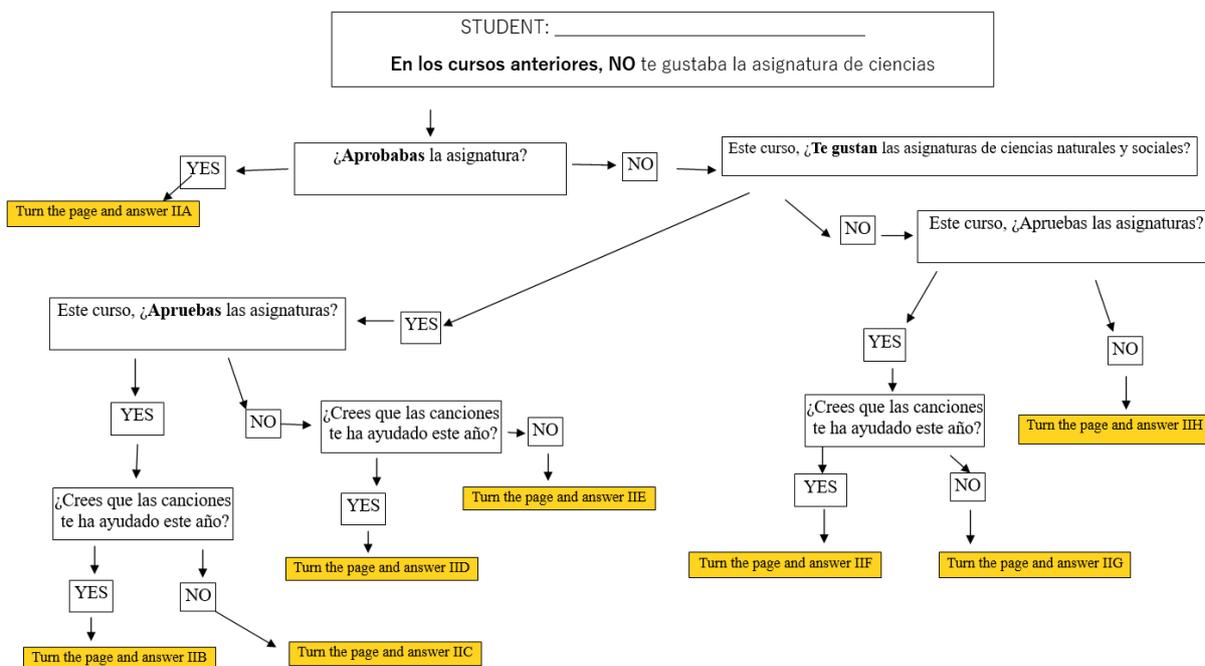
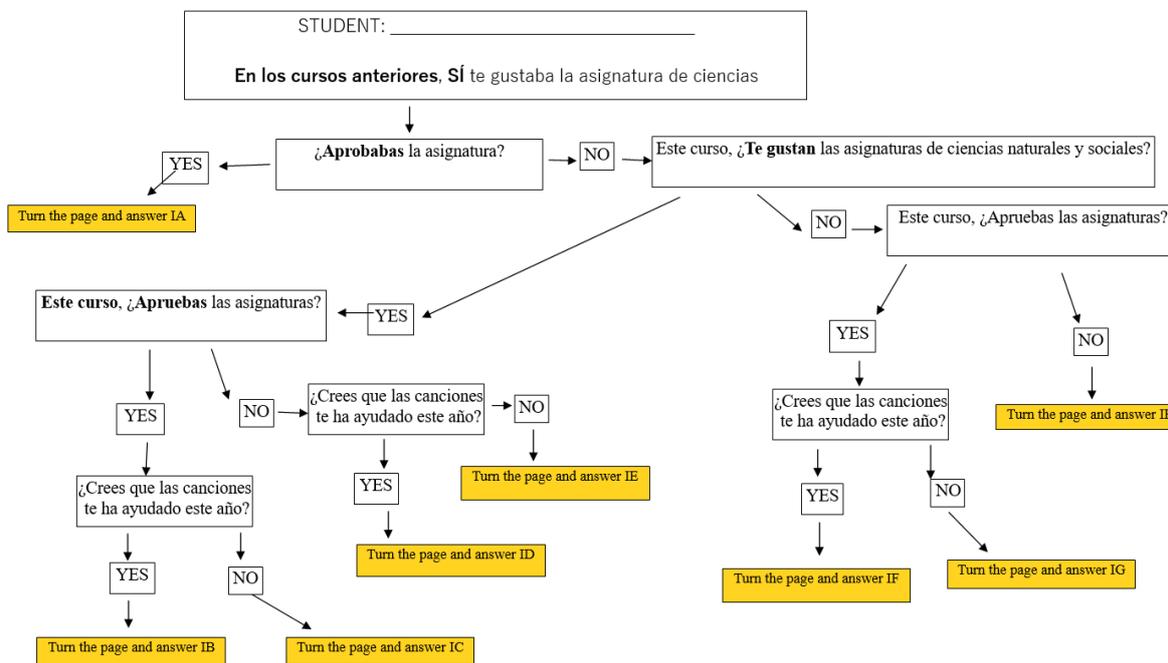
8. What two songs did you like best?
(¿Qué dos canciones son las que más te han gustado?)

9. If you could meet the musicians *Henry & Carlight*, what would you say to them?
(Si pudieras conocer a los músicos *Henry y Carligh*, ¿qué les dirías?)

⁵ Students knew the songs were from a music duo: *Henry and Carlight*. We wanted them to appreciate and judge them without any connections to the teacher, because they ignored that their teacher was one of the members of the duo.

Annex III - SELF-ASSESSMENT QUESTIONNAIRES

MUSIC IN THE NATURAL/SOCIAL SCIENCE CLASS-Diagram I



IA and IIA: Este curso ¿te gustan las ciencias?

¿crees que la música en ciencias ha beneficiado en algo a tu trabajo y estudio de la asignatura este año?

IB: Explica por qué crees que la música te ha ayudado este año en ciencias

IIB: ¿Por qué te gustan este año las ciencias si el año pasado no te gustaban?

Explica por qué crees que la música te ha ayudado este año en ciencias

IC: Explica por qué crees que la música no te ha ayudado este año en ciencias.

Has aprobado las ciencias este año, ¿no crees que el uso de canciones ha tenido algo que ver en ello?

IIC: ¿Por qué te gustan este año las ciencias si el año pasado no te gustaban?

Explica por qué crees que la música no te ha ayudado este año en ciencias.

¿Crees que las canciones han ayudado a que te gusten más las ciencias?

Este año has aprobado ciencias, ¿Crees que las canciones te han ayudado a ello?

ID: A pesar de haber suspendido el área este año, explica por qué crees que la música sí te ha ayudado.

IID: ¿Por qué te gustan este año las ciencias si el año pasado no te gustaban?

A pesar de haber suspendido el área este año, explica por qué crees que la música sí te ha ayudado.

IE: Explica por qué crees que la música no te ha ayudado este año en ciencias.

IIE: ¿Por qué te gustan este año las ciencias si el año pasado no te gustaban?

¿Por qué crees que este año sí apruebas las ciencias y el curso pasado no?

explica por qué crees que la música no te ha ayudado este año en ciencias.

IF: ¿Por qué este año no te gustan las asignaturas de ciencias si el año pasado sí te gustaban?

Explica por qué crees que la música sí te ha ayudado.

IIF: Este curso apruebas las asignaturas de ciencias, ¿qué ha cambiado con respecto a años anteriores?

Explica por qué crees que la música sí te ha ayudado.

IG: ¿Por qué este año no te gustan las asignaturas de ciencias si el año pasado sí te gustaban?

Explica por qué crees que la música no te ha ayudado este año en ciencias.

IIG: Este año apruebas las asignaturas de ciencias, ¿qué ha cambiado con respecto a años anteriores?

Explica por qué crees que la música no te ha ayudado este año en ciencias.

IH: ¿Por qué este año no te gustan las asignaturas de ciencias si el año pasado sí te gustaban?

¿Crees que la música en ciencias ha beneficiado en algo a tu trabajo y estudio de la asignatura este año?

IIIH: ¿Crees que la música en ciencias ha beneficiado en algo a tu trabajo y estudio de la asignatura este año?