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LANGUAGE AND CONTENT INSTRUCTION:
MAXIMASING STUDENT ENGAGEMENT
IN BILINGUAL PRIMARY SCHOOLS



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PRESENTACIÓN

LANGUAGE AND CONTENT INSTRUCTION: MAXIMASING STUDENT ENGAGEMENT IN BILINGUAL PRIMARY SCHOOLS

ENSEÑANZA DE LENGUA Y CONTENIDOS: MAXIMIZAR EL COMPROMISO DEL ESTUDIANTE DE PRIMARIA EN COLEGIOS BILINGÜES

El monográfico nº 48 de la *Revista Educación y Futuro*, tal y como su título indica, *Language and Content Instruction: Maximasing Student Engagement in Bilingual Primary Schools*, aglutina una serie de propuestas cuyo principal objetivo es la mejora de las condiciones de aprendizaje de la lengua y el contenido por parte del estudiantado de Educación Primaria en centros bilingües; de ahí que sean publicadas en inglés. Tanto los cinco artículos de la sección central como el dedicado a materiales proceden de Trabajos de Fin de Máster defendidos por estudiantes del Máster de Enseñanza del Inglés como Lengua Extranjera impartido por la Universidad de Alcalá.

En el primero de los artículos del «Tema central», Esther Testera ha tomado como punto de partida el enfoque por indagación, tan de actualidad para el estudio de las Ciencias Naturales en Educación Primaria, y lo ha aplicado en la asignatura de *Natural Sciences* con un grupo de 27 estudiantes del 3er curso de Primaria. Asimismo, ha tratado de medir, a través del *Test of Science-Related Attitudes (TOSRA)*, el impacto que dicho enfoque puede haber causado en los/las participantes del estudio, con un alcance prometedor.

Explorar los beneficios de implementar un programa de lectura extensiva para mejorar la adquisición de vocabulario en la clase bilingüe es el objetivo principal del artículo de Violeta Vera, que aparece en segundo lugar. Con este objetivo, se ha llevado a cabo un programa de lectura intensiva de textos originales; es decir, no adaptados, con un grupo de 21 estudiantes de 3º y otro de 23 estudiantes de 4º de Primaria. Por medio de pruebas previas y posteriores, se midió el aumento porcentual del uso de vocabulario control y experimental, con unos resultados realmente significativos.

El tercero, cuya autora es Gema Jiménez, se centra en evaluar el grado de efectividad y motivación de la combinación de la clase invertida y la

metodología AICLE en colegios bilingües, en particular en un grupo de 24 estudiantes de 6º de Educación Primaria. Para tal fin, se contó con la observación, un examen final y un cuestionario diseñado *ad hoc*, como métodos de evaluación tanto del proceso como del resultado. Las conclusiones muestran cambios tanto en la motivación como en la percepción del aprendizaje.

Laura Jiménez, en el tercer artículo, aborda los centros de aprendizaje basados en inteligencias múltiples como herramienta de mejora del aprendizaje AICLE a fin de cubrir las demandas y necesidades individuales educativas de sus estudiantes. Este enfoque combinado ha sido aplicado a dos grupos de 2º de Educación Primaria y en el análisis se han empleado métodos tanto cuantitativos como cualitativos. Los resultados muestran la existencia de su influencia no sólo en el plano de la adquisición lingüística, sino en otras habilidades de tipo interpersonal o memorísticas.

El quinto artículo que supone el broche del «Tema central» es el de Sara Sánchez, cuya propuesta aúna el uso de la literatura y la conciencia fonológica con el objeto de mejorar la lectoescritura de los estudiantes de lengua extranjera inglés y promover, a su vez, un hábito lector que facilite su aprendizaje de dicha lengua. El estudio examina los avances de un grupo de 17 estudiantes de Educación Primaria, analizando su percepción del tiempo lector y la correlación entre el desarrollo de la conciencia fonético-fonológica y la lectoescritura. El aprendizaje del vocabulario y la ortografía mediante el uso de cuentos breves y la instrucción fonémica fue medido mediante un test previo y otro posterior, mientras que la relación motivación-hábitos de lectura fue recogida con un cuestionario inicial y preguntas directas, cuyas respuestas quedaban registradas en un diario. Parece que la mejora en las destrezas lectoras, gracias al avance tanto en la adquisición del vocabulario como de la ortografía, arroja datos alentadores.

Finalmente, en el apartado dedicado a «Materiales», la autora, Andrea Madrid, presenta una propuesta didáctica enfocada al desarrollo de la lectura en el aula de inglés como lengua extranjera. Con esta finalidad, ha adaptado un relato corto basado en un cortometraje mudo con la intención de emplear la Estrategia de Visualización como técnica de comprensión lectora. Partiendo de la teoría de la codificación dual, ha diseñado una serie de actividades y materiales prácticas para estudiantes de 5º y 6º de Educación Primaria articulados en torno a los tres momentos habituales en la tarea escolar de la comprensión lectora: actividades de prelectura, acti-

vidades durante la lectura y actividades de poslectura. Esta propuesta no solamente permite desarrollar las estrategias lectoras, sino que promueve también la inclusión de distintos estilos de aprendizaje, metodologías cooperativas, aprendizaje autónomo y estrategias de pensamiento, sembrando así el germen para la escritura.

Animo al posible lector a bucear en las páginas de este volumen y, tras realizar un análisis crítico de sus contenidos, hacer suyas todas aquellas ideas, sugerencias, recursos y materiales que pudieran serle de utilidad para su actividad docente. Pienso, especialmente, en los maestros y las maestras, tanto en formación como en activo, que desempeñan su labor, o van a hacerlo en un futuro cercano, como docentes de lengua extranjera en contextos bilingües español-inglés.

Santiago Bautista Martín

Profesor titular del CES Don Bosco

Co-coordinador del nº 48 de *Educación y Futuro*



TEMA CENTRAL

The Impact of Teaching Sciences Through Inquiry Based Learning in a CLIL Primary Classroom

El impacto de la enseñanza de las Ciencias a través del aprendizaje basado en la Investigación en un Aula AICLE de Primaria

ESTHER TESTERA SIMÓN

MÁSTER EN ENSEÑANZA DEL INGLÉS COMO LENGUA EXTRANJERA,
TEACHING THROUGH ENGLISH IN BILINGUAL SCHOOLS. MAESTRA BILINGÜE

Abstract

Throughout this study, the main purpose has been the observation of the impact that the Inquiry-based method has had on my students' conception about science subject. Multiple tasks and activities were implemented to engage critical thinking and problem solving. Towards the end of this study, the experimental group completed a test whose results were compared with those obtained in the initial test. At the same time, a control group with similar abilities were taught based on a traditional methodology. The data was analyzed to find patterns according to these research questions: What are the main difficulties when implementing IBL to teach Science through A Foreign Language? Can IBL change and improve students' conception of science? Can IBL develop the scientific method?

Key words: inquiry-based learning, science teaching, cooperative learning, critical thinking, curiosity.

Resumen

A lo largo de este estudio, el objetivo principal ha sido observar el impacto que ha tenido el método basado en la indagación en el concepto que tienen mis alumnos de las ciencias. Se llevaron a cabo múltiples tareas y actividades para involucrar el pensamiento crítico y la resolución de problemas. Hacia el final de este estudio, el grupo experimental completó un test cuyos datos se compararon con los obtenidos en el test inicial. Al mismo tiempo, se enseñó a un grupo de control con habilidades similares en base a una metodología tradicional. Los datos se analizaron para encontrar patrones de acuerdo con estas preguntas de investigación: ¿Cuáles son las principales dificultades al implementar IBL para enseñar ciencias a través de una lengua extranjera? ¿Puede IBL cambiar y mejorar la concepción de las ciencias de los estudiantes? ¿Puede IBL desarrollar el método científico?

Palabras clave: aprendizaje basado en preguntas, enseñanza de las ciencias, aprendizaje cooperativo, pensamiento crítico, curiosidad.

1. INTRODUCTION

Master classes, problem solving, projects or laboratory tests were the most popular pedagogical methods used in Science instruction. Nevertheless, back in the 1960's, there was movement away from these traditional methods that tried to achieve a higher involvement from the children through the development of thinking skills in the scientific method (Barron & Darling-Hammond, 2008; Perkins, 2009). Although much has been done to improve the methodology of science teaching (Enciende, 2011) in general, little attention has been paid to Inquiry-Based Learning (henceforth IBL) in the teaching of Science through a Foreign Language. In Spain, the current Spanish education law (BOE, 2022, p. 28) reflects that:

Methodological approaches to teaching Science must start from the students' curiosity to understand the world that surrounds them, favoring active participation in the different processes of inquiry and exploration typical of scientific thought. Therefore, the students must be able to identify and pose small problems; use reliable sources and evidence; obtain, analyze and classify information; generate hypotheses; make predictions; perform checks; and interpret, argue and communicate the results. (My translation)

Over the last few years, the focus has been placed on Content and Language Integrated Learning (CLIL), particularly on identifying effective ways to teach content through a Foreign Language (FL), especially Science (Campanario & Moya, 1999). Learning by doing, thinking skills, active learning, collaborative tasks and the use of language for real purposes are some of the principles that connect the implementation of CLIL and the practical dimension of IBL (Coyle, Hood & Marsh, 2010). The impetus for this study is twofold, firstly the need to involve students in IBL in order to enhance their innate thinking and observation skills as well as their abilities to reflect on the data collected and secondly further investigation is required due to the lack of research on IBL in the teaching of Science through a foreign language.

More specifically, this article tries to address the following three research questions: What are the main difficulties when implementing IBL to teach Science through a FL? Can IBL change and improve students' conception of Science? And can IBL develop students' scientific method? These questions led me to the following hypothesis: Inquiry-based instruction helps Primary students that study Science through a FL to develop a greater understanding

of the world that surrounds them since they will be able to acquire the necessary steps needed in research, such as posing questions about their surroundings where they will get answers according to their environment, as well as the capacity to apply this knowledge to the real world.

Following this brief introduction, section 2 will present an overview of the concepts and relevant theoretical issues. Section 3 deals with the data collection process. Section 4 concentrates on the implementation of this method and the different experiments and processes that have been carried out. Finally, section 5 compares the results collected before and after the test that were administered.

2. THEORETICAL BACKGROUND

In this section, I will first attempt to define inquiry and explain how IBL works. Secondly, I will review the origins and development of IBL. Finally, I will offer a critical review of the existing literature.

2.1 Inquiry and Inquiry-Based Method

As Couso (2014) points out, the term «inquiry» is surprisingly polysemic in educational literature since this term is more than asking ourselves about what we want to know. According to the Cambridge dictionary, inquiry deals with «the process of asking a question» and is defined as «an official attempt to discover the facts about something». In literature, Short (2009) has defined inquiry as «a collaborative process of connecting to and reaching beyond current understandings to explore tensions significant to learners.» (Short, 2009, p. 12). The most comprehensive definition was put forward by Linn et al. (2004, p. 4) they define inquiry as «an intentional process where problems are identified and analysed, different alternatives are studied, research is planned, models are built, hypothesis is investigated, information is sought and there is debate among colleagues where coherent arguments are constructed».

At present, inquiry is being used as a strategy for teaching and learning science as an alternative to the standardised methods. Following Couso's lines (2014, pp. 3-4), IBL has the following characteristics: (a) It is classi-

fied into research environments; (b) The student's role is more active than in traditional learning; (c) Teachers acquire a more passive role; (d) they act as facilitators, there are more sources of knowledge; (e) Attitude and motivation play an important role; (f) Students work in groups, obtain data, ask questions and reach agreements; (g) Students develop their autonomy and decision-making capacity; and (h) Stages are designed in order to simulate scientific methodology.

When IBL is implemented in the classroom, it follows the 5 E's structure (Bybee & Landes, 1990), where each one describes a phase of learning: (1) **Engage**, students identify problems of a scientific nature making connections with their previous knowledge; (2) **Explore**, students actively explore the environment and they can manipulate materials to identify and develop concepts or processes; (3) **Explain**, they verbalize the concepts they have been exploring. Formal terms, definitions, and explanations are introduced by the teachers; (4) **Elaborate**, this is an opportunity to practice skills and behaviors where children develop a deeper understanding of the concepts and get more information about their interests in the area; and (5) **Evaluate**, students assess their own understanding and abilities and the teachers also evaluate students' understanding of key concepts and skill development. In this line of thought, Bybee (1997) states that:

using this approach, students redefine, reorganize, elaborate, and change their initial concepts through self-reflection and interaction with their peers and their environment. Learners interpret objects and phenomena and internalize those interpretations in terms of their current conceptual understanding. (p. 176)

In addition, feedback plays an important role in the students' assessment and should be considered when presenting their explanations. In this process; informal evaluation may be found at the beginning and throughout any of the 5E's sequence. Likewise, a formal evaluation can be completed after the elaboration phase. Learners can be part of this process by asking what the main elements in their learning process have been. Thus, they can elaborate on the rubrics and other types of tools.

The teacher provides a supportive role whose input directly depends on these levels of inquiry. As it can be seen, in open-inquiry children formulate a question to research while in guided-inquiry the teacher must guide the

research with the construction of a question (Weaver et al., 2008). The different levels of autonomy discerned by Windschitl (2003, pp. 114-115) are: **Open inquiry:** Students decide what they want to investigate and how to do the inquiry; **Structured inquiry:** The teacher proposes both the inquiry and the method to carry out the investigation; and **Guided inquiry:** The teacher provides the inquiry and the learners choose how to resolve it.

2.2 The History of Inquiry-Based Learning

In the beginning, the term ‘inquiry’ was used to teach science in the way that scientists practiced it (Dewey, 1910; Schwab, 1960). However, educators are still debating how to measure it in practice (Abrams, Southerland & Silva, 2008; Chinn & Malhotra, 2002). The essence of inquiry has a strong origin in Ancient Greece, more specifically, in Socrates’ time (470-399 BC) where we can find that the method of scientific inquiry is not a contemporary concept. The Socratic method created a space where learners and instructors maintained dialogues to promote critical thinking and to seek answers to important questions. In the 13th century, we can find the Latin term *inquirere* that means «to seek for». In those days, it was intended to put an end to mysteries, tradition and superstition through direct observation of phenomena. Three centuries later, Renaissance scientists such as Galileo Galilei and Da Vinci relying and expanding on the Socratic method created new technologies such as the microscope and the telescope, thus adding more elements which were needed for the scientific method. During the European Enlightenment in the eighteenth century, this desire to search for scientific knowledge expanded and proliferated (Friesen & Scott, 2013).

The IBL, as it is known nowadays, was started in the 1950’s when the space race between the US and the Soviet Union increased the need to develop a more complex Science curriculum. «If a single word had to be chosen to describe the goals of science educators that began in the late 1950s, it would have to be inquiry» (Haury, 1993, p. 4) Likewise, throughout the first half of the Twentieth century, John Dewey, carried out a reform of the educational system that came up with the first IBL methods in the US. According to the National Science Education Standards (National Research Council, 1996, pp. 122 & 145), when children or scientists inquire into the natural world, they ask questions, plan investigations, collect

relevant data, organize and analyse collected data. The purpose of this study was to investigate the effects of inquiry-based instruction on third-grade students' attitudes and participation in an elementary science classroom. Students were encouraged to ask and answer their own questions. Moreover, the analysis of instructional practices state that Inquiry-Based research used in scientific investigations has been included in the laboratory curriculum of college biology since the 1990's. The use of inquiry-based research increased from less than 10 % to almost 80 % in laboratory classrooms in universities throughout the United States (Sundberg & Armstrong, 1992; Sundberg et al., 2005).

2.3 Review of the Literature

It is conceivable that the implementation of IBL in our classrooms would bring endless advantages. Furthermore, the investigations that have already been carried out in this field are enlightening as the advantages outweigh the disadvantages in terms of academic achievement, students' performance, learning skills and visible results. Regarding to students' academic achievement, as Cohen and Lotan (2014) argued, learners who participate more in lesson discussions get higher scores on standardized examinations. The traditional gaps which emerge in subgroups related to poverty, race or gender differences are significantly decreased when learners have to participate in active learning experiences.

With regard to visible results, a study which was carried out with students at Flinders University reveals that the Inquiry-method had a positive impact on both student outcomes and student satisfaction (Smallhorn et al., 2015). Finally, I would like to conclude this section by highlighting that although IBL is connected with scientific principles, it is a teaching method which can be applied in other areas of knowledge acquisition, to encourage discovery. IBL should be unequivocally used in the educational environment that we are living in today where everything is available at the click of your mouse.

3. METHODOLOGY

The main purpose of this research is to understand how IBL affects my students' participation and attitude towards the learning of science through a

Foreign Language. For doing so, qualitative and quantitative methods have been used to collect and analyze data through multiple sources: science attitude test, student portfolio, teacher field notes, and student interviews.

3.1 Research model and the study group

This research was a quasi-experimental study to estimate the causal impact of the Inquiry-method on a classroom without random assignment. The study was carried out with non-equivalent groups, which included pre and post-test design with the control group. The students were divided into two different classrooms two academic years ago by school administration, so it was not feasible to assign students randomly to both experimental and control groups.

The study was conducted with 29 experimental (18 boys and 11 girls) and 27 control group students at 3rd grade in a semi-private school in Madrid, Spain. Thus, the class is composed of a heterogeneous group, with different needs and interests. English Language has been taught since Preschool, so in general terms, the students' English level is good.

3.2 Data collection tools

The Test of Science-Related Attitudes (TOSRA) was completed by the experimental group as pre-test and post-test, the results will explain if there are significant changes in their conceptions about the subject before and after implementing the method. The test was modified and reduced into 20 multiple-choice items, except for two questions that offered the possibility to add comments. In this way, qualitative and quantitative information was compiled to measure the students' interest in Science. The control group only completed the test at the end of the process as their methodology did not change, they studied the information presented in the book and completed the activities proposed in it. In the experimental group, the TOSRA was conducted as a pre-test to collect information about the children's attitudes and feelings towards science and instruction before the implementation of the method. Likewise, at the end of the period of observation, the students completed the TOSRA as a post-test was in order to measure if the previous results were altered or had improved after the implementation of the IBL method at the end of the sixteen weeks. Informal video recorded interviews, student portfolios and field notes were

also used to compile data in order to make sure that the scientific method has been properly acquired by the students.

Thirteen qualitative and quantitative questions were asked to different teachers with different backgrounds. The survey could be answered through Microsoft Forms, to collect teacher feedback about this issue. In this way, we can obtain a real appreciation of what happens in Science in my research field. In addition, we can obtain real data on the factors that do not allow the implementation of this method in the classroom.

3.3 Procedures

The study took 16 weeks, from September to January, each week has two 45-minutes sessions. Sometimes it was necessary to take time from other subjects' sessions to carry out the method properly. Two different paths were used in the current study. On the one hand, the control group was taught without changing the methodology; they followed the guidelines established by the book and the contents and the activities proposed on it. On the other, the experimental group was taught by using the Inquiry-method and the 5 E's instructional model also field trips and different activities that are explained below.

For setting out the research, it was essential to conduct a survey to access the attitudes and feelings of the students in the experimental group towards science. Learners took a pre and post attitude survey. Due to the age and characteristics of the learners, it was necessary to modify the Test of Science-Related Attitudes (TOSRA) that Dr Barry Fraser developed in 1981. The statements were shortened and reduced to 20, since the original test composed of 70 sentences. The answers were given as emoticons in place of acronyms such as Strongly agree (SA), Agree (A), Not Sure (NS), Disagree (D) or Strongly Disagree (SD) and the negative connotation that each statement showed was changed into affirmative clauses.

Given that personal *interviews* are very useful in establishing through verbal expression what students observe or experience, some children were randomly selected to be interviewed after the implementation of the IBL method. In order to do this, Students' names were written on slips of paper and placed in a box, participants for the interviews were then randomly selected. Questions were modified according to their answers and conver-

sation between teacher and students was used to detect difficulties and complete or clarify previous data. In the same way, the personal interview also allowed me to enquiry further in specific aspects, clarify doubts or complete information (Araque Hontangas, 2011).

Data was collected by means of field notes and student portfolios, where my teaching practices and students' feelings were reflected. These tools helped me to improve my teaching practices in the following sessions. It must be pointed out that part of the qualitative data was collected in the last two questions of the test, and the rest was gathered through the student journals, the teacher field notes, and the interviews.

The topics covered through the implementation of IBL with third graders were: living things (i.e. life processes in animals, humans, plants); plants (i.e. parts of a plant, plant reproduction and nutrition, types of plants); animals (i.e. vertebrates and invertebrates, nutrition and reproduction).

Figure 1

Plants KWL chart in paper format



Figure 2

KWL chart on the whiteboard



Different KWL charts (What I Know, What I Wonder, What I Learned) served as graphic organizers that helped the students to organize the information of some topics over a period of time. They had a KWL chart in their notebooks or portfolios and we also shared our thoughts on the one that was displayed on the whiteboard. Through the second phase called exploration, learning environments were created for students where they could observe scientific processes, record data, develop hypotheses, design and plan experiments, interpret results and organize and share their findings.

Different activities were implemented in the hypothesis phase such as experiments where children had to guess what will happen with each one of the different pots, measure the tallest shoot in each pot and count the number of shoots in each one.

Figure 3

Experiments with seeds in five pots with different conditions



In the first picture above, we can see the first shoots sprouting. Nonetheless, mistakes commonly occur in the learning process and were reported in the students' conclusions. Although it may be considered as a very simple process, the children were required to learn how to measure objects for this task.

Figure 4
Picking grapes



Figure 5
Planting lettuces



Figure 6
Taking notes in the field trip

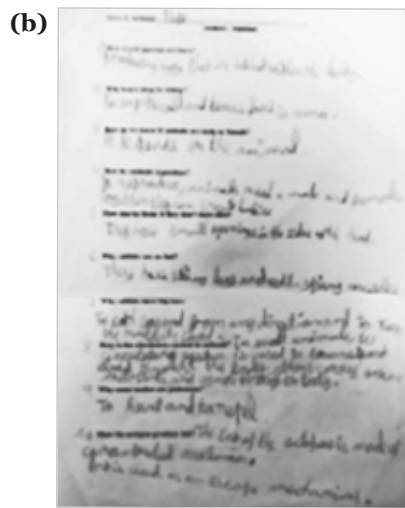


In *figures 6 to 8 (a)*, the children can be seen involved in different activities related to plants. On a field trip, visited a vivarium where the students could pick strawberries, grapes and pumpkins and they planted lettuce and seeds in different soils and pots.

Figure 7
Research corner



Figure 8
Research activity using laptops



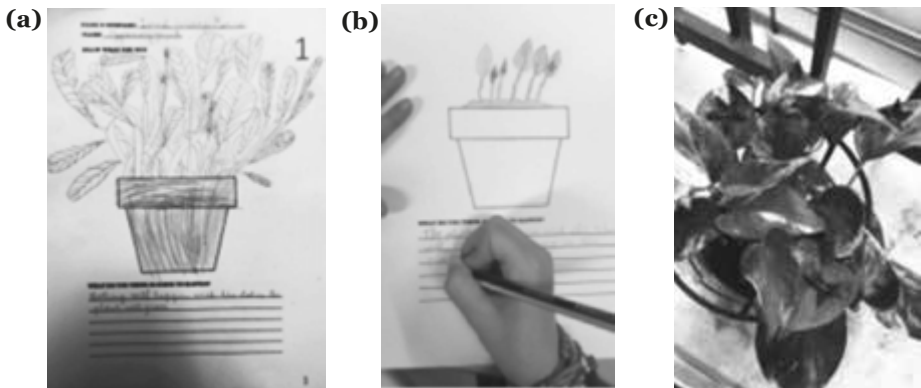
In *figure 8 (b)*, a research corner with magazines and books was set up in the class for finding answers to their questions as well as arousing their curiosity on this topic. Furthermore, they could use laptops with Internet access to find information on the topic. The materials used in the corner

were provided by the Science teachers and as such were in Spanish. One drawback that we discovered was that despite the study being conducted in a bilingual school, didactic materials in English were not always readily available.

The activities completed throughout the *explanation* step were intended to help students show their understanding of concepts and to apply their knowledge to new fields.

Figure 9

Experiment about photosynthesis and deciduous plants

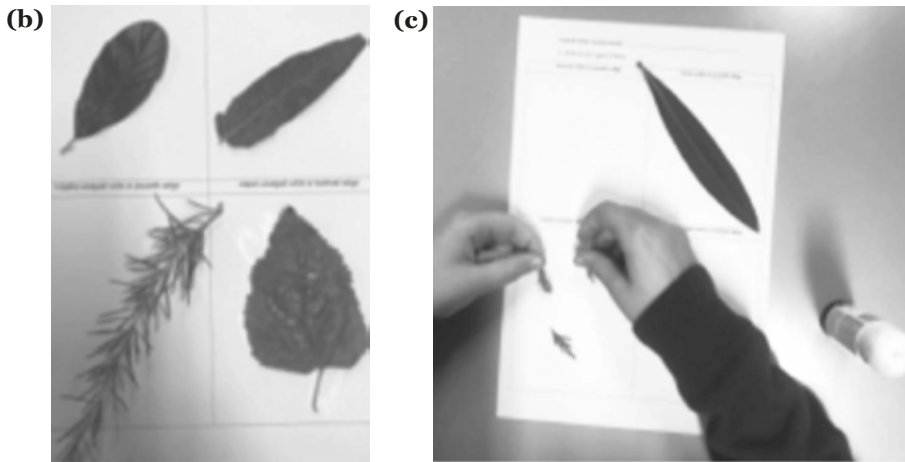


In *figures 9 (c) to 10 (b)*, the children draw what they see and then hypothesize about what will happen in the next few weeks. Three black stars were placed on three leaves of the plant preventing the sunlight from being absorbed by the plant in these parts. The children served that this causes the leaves turn yellow, because sunlight is necessary for plants to carry out photosynthesis.

Figure 10

Experiment about photosynthesis and deciduous plants





In *figure 10*, the students can be seen looking for different types of leaves in the school area in order to classify them. Therefore, we could also see the difference between deciduous and evergreen trees. Once we collected the leaves, we established the types and added some more types.

The activities that were carried out in the evaluation phase meant that learners could assess their understanding and newly acquired skills. These activities were also used by the instructor for both formative and summative evaluations of the students' learning process.

Finally, in the rubric activity I want my learners to be involved in the process of creating the assessment for the unit. We created the main headings and we developed the different ways in which we can answer different questions, letting them know the different punctuation in each one of the cases.

4. ANALYSIS AND RESULTS

This study was carried out throughout the first term and it aimed to address how inquiry-based instruction influenced children' participation and their attitudes towards science. The primary mode of investigation was based on action research with my current students.

4.1 Difficulties when implementing inquiry- based learning method

The first research question features the difficulties that this method may present through its implementation. These will be analyzed by asking teachers' opinions about this issue. This study discovers that there is an obvious tension between their understanding of ideal method to teach Science and the challenges involved in implementing IBL in the classroom. The survey was filled out by 38 teachers from both Primary and Secondary levels, although this study is focused on Primary, it was considered important to observe whether this method was known by teachers from other educational stages. The conclusions of this survey must be taken as a pilot study and in order to generalize it, the sample should be expanded in future studies, this should be taken as a starting point for future investigations in this field. As it has been previously noted, the limitations involving human resources and sufficient time, meant that decisions had to be made to work based on the data available. For all these reasons, these can be the foundations for future investigations.

From the 38 teachers surveyed, 39.5 % work in State schools, which represents more than half of them, 55.3 % work in semi state schools while only 5.2 % of the respondents work in private schools. Additionally, 73.7 % of the teachers surveyed work in primary education, 8.5 % in secondary education, and 7.8 % in preschool. Of these 38 teachers, 71.05 % of them have taught Science at some point in their lives. The remaining 28.95 % have never taught Science. Another factor which is important to take into account is the language in which Science is taught in their schools. In 81.6 % of the interviewees' schools Science is taught through English, on the other hand, only 18.4 % of the schools continue to use the mother tongue, Spanish, as the teaching medium for the subject. Regarding what the curriculum states about teaching Science in Spain, 71.05 % of the interviewees affirm that they are aware of these guidelines. However, only 57.9 % affirm categorically that this method is implemented in their classrooms. An example of a typical answer would be: «Yes, I strongly believe that science should be learned this way and I always try to promote inquiry, creative and critical thinking, cooperative work, investigation, etc.».

Another interviewee made the following comment: «Definitely, we use collaborative methods, project-based learning, open ended questions, and students are encouraged to think for themselves. We rarely use the text book». It is important to highlight that the textbook could be considered the antithesis of this method since the information is already given, the knowledge that students must assimilate is already written, instead of the students making decisions about what they want to know or discover. By contrast, 26.3 % of the teachers who completed the survey, affirmed categorically that they do not carry out this method:

Not as much as I would like to because even though the school likes this methodology, students have a textbook, which needs to be followed. I understand that the book is not the only tool available and should be just a guide, but with only 45 minutes it is difficult to apply this methodology and complete the book.

At this point, we can observe some of the drawbacks that professionals encounter in their daily teaching practices. 15.8 % are insecure about the implementation of the method «It's difficult to practice it in the two sessions we have a week while also teaching the rest of the curriculum which is tested in the state exams. Besides, the previous quite? is not related to the rest of the content». Despite the fact that the answer should be «yes» or «no», many of them communicated their discomfort with some aspects that govern our teaching subject and what little can be done about aspects such as the State exams.

Another important aspect that should be investigated is how much awareness there is of this method, a method that goes beyond doing research or laboratory practices in a timely manner, amongst the teaching professionals. Of the 47.36 % of professionals who claim to have heard of this method, the most curious thing to note is where they knew of it from: From a bachelor's degree, thanks to an English publisher of my school (Oxford), reading on the internet, their own research, from professional training devoted to broadening teacher skills and competences, because of my experience as a researcher, in a teaching course, in pedagogic innovation courses. Only 5 of them, which means 13.15 % of the surveyed, affirmed that they learnt about the method thanks to some subjects in university. It seems striking, that something that our curriculum demands, while not specifically under the name of IBL, is not taught in basic teachers training and that it is the teachers themselves who have, of their own volition, have learnt about this methodology.

Following the previous question, when they were asked if they would like to put IBL into practice in their classrooms, only one of them answered «no» because of the students' age. Of the teachers questioned, 86.84 % of them argued that this method sounds very good considering the following statements: «I think this is the way students should learn science. This way, they will really enjoy it and will feel motivated and responsible for their own learning» and «children should learn Science taking into account their innate way in which they know the world, by asking questions». Others reflected that «It improves their scientific competence» and «as it is a methodology in which students are able to think, reflect and wonder about the world. From my point of view, something that is experimented by themselves, is worthy and easier to recall in a future». Whether or not they put this methodology into practice, the survey fulfilled a function, which was to make this method known to those who had not heard of it. It seems that with some answers, the basis on which this method is founded has been established; logical and critical reasoning, a respect for the way in which children learn, reinforcing and encouraging their critical spirit, giving them the opportunity to learn what they really want by establishing minimums or guiding the knowledge acquisition, etc.

To conclude this section, it is important to highlight the problems that teachers believe that this method can present through its implementation. In the following table, four possible drawbacks were presented, and they had to choose their level of agreement; being 1 fully disagree and 5 strongly agree:

Table 1
Results of the survey implementing inquiry-based learning method

Inquiry-based method may be time-consuming Mean = 3.58				
1 Fully disagree	2 Disagree	3 Not sure	4 Agree	5 Strongly agree
2	2	13	14	7
5.26 %	5.26 %	34.21 %	36.84 %	18.42 %

Money: school should provide me a quantity of money for buying materials for the experiments. Mean = 3.32				
1 Fully disagree	2 Disagree	3 Not sure	4 Agree	5 Strongly agree
4	7	8	11	8
10.52 %	18.42 %	21.05 %	28.94 %	21.05 %
Academic formation: I've never been taught how the scientific method works. Mean = 2.97				
1 Fully disagree	2 Disagree	3 Not sure	4 Agree	5 Strongly agree
10	4	7	11	6
26.31 %	10.52 %	18.42 %	28.94 %	15.78 %
Knowledge: I'm not sure of my knowledge in the field of science. Mean = 2.26				
1 Fully disagree	2 Disagree	3 Not sure	4 Agree	5 Strongly agree
13	10	8	6	1
34.21 %	26.31 %	21.05 %	15.78 %	2.63 %

To start with, most of the teachers agreed that this method may be time-consuming. It is evident that this method takes more time than direct instruction, since we start from the students' previous knowledge and it is them, with the help of the teacher as facilitator, who guide the course to new knowledge. Secondly, it is obvious that some experiments need different materials that not all schools can provide. Based on my own experience, the majority of materials were provided by the school, but other materials such as plants, soil, cotton, sand, seeds, and glasses were provided by me. We require the schools' assistance to implement this methodology. However, the costs that may be involved should not be an impediment to the proper functioning of the activities. In my case, I preferred to oversee the materials I needed because I knew where I could find them in a faster way. Preparing them with enough time, it should not be an impediment to school. According to the data obtained, we

could assume that money required for carrying out the different activities through IBL does not imply a drawback.

Approximately half of the teachers know how the scientific method works. At this point, we must take into account that if half of the professors surveyed do not know what the scientific method consists of, we can conclude that they will not know how to transmit it to their students, and even less how to work with learners in this way. Despite the fact that half of the participants showed confidence in this area of scientific knowledge, the rest of the teachers did not feel confident about teaching sciences. Of the teachers who responded that they did not feel confident about teaching the methodology, only two were secondary teachers. Thirteen of the participants (34.21 %) agreed that their knowledge was not good enough to teach this subject. Furthermore, these are currently teaching in primary and pre-school stages, which means that they should have taken subjects in university where they had to deal with teaching Sciences. Although it is a small sample of respondents, I consider it a revealing fact in which until a few months ago, I saw myself reflected. Finally, a space to add other inconveniences of the method was added so that the respondents freely wrote their opinions about it. Five of them revealed that there were no other things that would stop them carrying out this method «I don't think there are factors that would stop me when carrying out Inquiry-based method since I think is the best one».

Regarding time limitations, seven of them repeated that it is an important factor to take into account when applying this method «Time! We have to see so many concepts that it's quite difficult to see them all through experiments or action-reaction processes» another explained:

The lessons are very short (45 minutes). There is too much content to teach them in a short period of time. Some experiments take too much time to be prepared and with large classes it could be difficult to carry them out, especially if there are disruptive students. In addition, it sometimes requires time for the teacher (previous information, how to prepare the activity, organize students, etc.).

Some of them mentioned areas for concern might be, their English level, the number of learners in the classroom, their knowledge or behaviour: «The number of students in a classroom, sometimes the number is high and this makes the work and the ability to follow them individually more

difficult», «Conducting research with teenagers is challenging because every class has its own features and plans don't always work as expected. Students' bad behaviour and lack of interest may definitely affect your data and thereby your results». «How students show their knowledge. The way to express the contents in English».

The teacher staff was mentioned by three of the teachers questioned, as one of the possible reasons why this method could present difficulties; «the teachers that also work in my school, for them it is easier to read the book and do the activities rather than preparing these lessons». It is an interesting point of view especially as this is a time-demanding method that needs to be put into practice in the following years, otherwise, all these skills that need to be continuously updated will be forgotten. Furthermore, three other teachers agreed on the idea that they would need specific training in order to apply this method; «The non-supervision of experts in IBL while I am developing this methodology» or «Universities should have a specific program about teaching science through this method». As far as I am concerned, I fully agree with the following statement «If we do not eliminate text books. Their use promotes factual learning and memorisation over investigation». As they work as a guide that has to be followed, the teachers and students will be unable to develop further research when the knowledge that they should know is already taken for granted.

4.2 Changes and improvements on students' conception of science

A research project was designed to assess the impact of Inquiry-based learning on primary students' conception of Science. Through multiple sources of data, the second research question was addressed. The Test of Science Related Attitudes (henceforth TOSRA) was the main tool used in the study. This survey was administered as a pre and post-test at the beginning and four months after the implementation of the method. Likewise, student journals, audio recordings, and student interviews were essential to uncover other aspects of this study. The second research question was posed to analyze the quantitative and qualitative data obtained by TOSRA, and verify whether or not there was a positive impact on the students' attitudes towards IBL by comparing the results gotten before and 16 weeks after its implementation in the classroom.

The analysis of the data will be divided into two parts, the first one will deal with questions that are related to science in general terms and the subject of Science; such as the importance of fostering curiosity through this method and letting students see the impact and benefits that Science has in the real world, their reactions and feelings about this subject in the school, and comparing Science with other subjects. The second one is directly related to the implementation of IBL; their attitudes and skills when developing the scientific method, and their conceptions about Science subject and the method.

To start with, the first section provides evidence about the importance of fostering curiosity and discovery-based learning in all areas and specifically in science. Curiosity and exploration are two interrelated concepts that are commonly linked to motivational constructs like motives, drives, intrinsic motivation, etc. (Voss & Keller, 1983).

Table 2

TOSRA TEST RESULTS: The importance of curiosity in learning stages

	SA	A	NS	D	SD
1. I am curious about the world in which we live					
Experimental – Pre-test	64.3 %	17.85 %	17.85 %	0 %	0 %
Experimental – Post-test	51.72 %	34.48 %	13.79 %	0 %	0 %
Control	64 %	16 %	20 %	0 %	0 %
2. Finding out about new things is important					
Experimental – Pre-test	57.15 %	35.7 %	0 %	7.15 %	0 %
Experimental – Post-test	82.75 %	13.79 %	3.44 %	0 %	0 %
Control	64 %	12 %	12 %	12 %	0 %

As far as curiosity is concerned, similar results were gotten in the experimental and control group. As it has been shown previously, children show an intrinsic curiosity as a way in which they can learn about the world. However, the question that deals with the importance of finding out about new things, an improvement is relevant. In the experimental group an increase of 25,6 % was noticed. This is relevant as far as the scientific

method was worked. Learners could see the importance of announcing new discoveries in different fields and how important they are in terms of evolution. At the beginning of the school year, children did not seem to be motivated with Sciences due to the previous years they learned contents studying them directly from their books instead of exploring them. This issue was taken as a starting point to implement this method with the objective of relating what is done in the classroom with the real world.

Table 3
TOSRA TEST RESULTS:
Impact and benefits of Sciences in real life

	SA	A	NS	D	SD
3. Science helps to make life better (medicine, discoveries, etc.)					
Experimental – Pre-test	46.42 %	32.14 %	17.85 %	3.57 %	0 %
Experimental – Post-test	65.51 %	17.24 %	17.24 %	0 %	0 %
Control	76 %	20 %	4 %	0 %	0 %

In the light of the previous argument, connecting the contents to the real world has been a key element in the guiding thread of the sessions. Learners always demand a real purpose of the contents that they are learning. In this aspect, table 3 represents the results of their thoughts in this field, letting them realize about the real purpose of the experiments, the importance of discoveries and the need to repeat tests to make sure of the progress we made. Children in the experimental group, could be more aware about this aspect at the end of this study. Surprisingly, the results of the control group show that these children are more aware about this aspect. This could be happened because students often can reach these conclusions from other approaches. Nevertheless, the importance lies in the fact that students get reasons to realize that the contents that they study are significant for the world in which we live. Natural science subject has been the area of knowledge used to implement the method, so asking learners in different ways what are their feelings about this subject has been a key element in this study.

Table 4
TOSRA TEST RESULTS: Reactions about Science lessons

	SA	A	NS	D	SD
5. I would enjoy school if there were no science lessons.					
Experimental – Pre-test	10.71 %	10.71 %	7.15 %	17.85 %	53.57 %
Experimental – Post-test	3.44 %	0 %	6.89 %	13.79 %	75.86 %
Control	44 %	0 %	8 %	8 %	40 %

This table illustrates significant differences in the results gotten in the pre and post-test by the experimental group in terms of enjoying or not Science lessons. What is relevant is the fact that the percentage of students that did not enjoy Science at the beginning of the course has decreased. By contrast, the percentage of students that enjoyed the subject increased in 22.29 %. In the control group, learners studied similar contents by following a more traditional method. However, the results were extremely striking since the students have a very divided opinion that tends to extremes; 44 % of the students do not enjoy science subject, while 40 % of the class thinks otherwise. These data show that IBL is a good method to let students learn in a more relaxed atmosphere, where they enjoy the lessons.

Table 5
TOSRA TEST RESULTS: Comparing Science lessons with others

	SA	A	NS	D	SD
7. Science is one of the most interesting school subjects.					
Experimental – Pre-test	28.57 %	14.28 %	39.28 %	10.71 %	7.15 %
Experimental – Post-test	48.27 %	34.48 %	13.79 %	3.44 %	0 %
Control	36 %	8 %	28 %	8 %	20 %

This table shows a certain improvement when we compare Science subject with the rest. At first, only a quarter of the class thought that it was the best subject, but in the end, more than the half of the class shared the same thought. On the contrary, control group showed very divided opinions; 36 % of them though that it was one of the most interesting subjects, and 20 % though the opposite, having a 28 % of the students that were not sure about this issue. One of the reasons why it can happen is because the traditional method does not make the same impact on the students in the same way.

Table 6
TOSRA TEST RESULTS: Looking forward Science lessons

	SA	A	NS	D	SD
8. I look forward to science lessons.					
Experimental – Pre-test	39.28 %	28.57 %	21.42 %	7.15 %	3.57 %
Experimental – Post-test	44.82 %	37.93 %	17,24 %	0 %	0 %
Control	32 %	20 %	0 %	16 %	32 %

In this case, the students were asked about their desire for having Science sessions. The results improved in the post-test to such an extent that no student thinks otherwise; considering the answers of Strongly Agree and Agree, an improvement of 14.9 % was noticed. Newly, the results of the opinions in the control group were very distributed along the possible answers, showing that they were sure of them because no one answered not being sure. Having all these previous results into account, the second section will deal with the impact that IBL and the scientific method have had in students' conception about Science subject, that is the real nature of this research. Throughout the following table, different data that deals with teamwork, repeating experiments, using new methods and reporting expected and unexpected results, will be shown.

Table 7
TOSRA TEST RESULTS:
Attitudes and skills when developing the Scientific method

	SA	A	NS	D	SD
9. When I work in groups, I like to listen to people whose opinions are different from mine.					
Experimental – Pre-test	32.14 %	10.71 %	28.57 %	14.28 %	14.28 %
Experimental – Post-test	62.06 %	10.34 %	20.68 %	3.44 %	3.44 %
Control	52 %	16 %	8 %	8 %	20 %
12. I like repeating experiments to check that I get the same results.					
Experimental – Pre-test	25 %	17.85 %	28.57 %	14.28 %	14.28 %
Experimental – Post-test	58.62 %	3.44 %	34.48 %	0 %	3.44 %
Control	68 %	4 %	4 %	8 %	16 %
13. In science experiments, I like to use new methods which I have not used before.					
Experimental – Pre-test	57.14 %	25 %	10.71 %	3.57 %	3.57 %
Experimental – Post-test	72.41 %	3.44 %	17.24 %	3.44 %	3.44 %
Control	56 %	16 %	20 %	0 %	8 %
14. In science experiments, I report unexpected results as well as expected ones.					
Experimental – Pre-test	14.28 %	7.15 %	39.28 %	10.71 %	28.57 %
Experimental – Post-test	58.62 %	13.79 %	24.13 %	0 %	3.44 %
Control	40 %	4 %	16 %	4 %	36 %

This last part of the TOSRA tries to give an answer to questions that are related to the development of the scientific method. Active listening has been an essential element throughout this process. The first question of table 7 presents that this skill has been worked since the beginning, as the 62.06 of the experimental group, 74.4 % of them if we also take into account those that answered agree, liked to debate and listened to others that had different opinions. At the beginning of the implementation, they only were focused on their own results. However, within the days they were able to appreciate this

fact as they could learn from other points of view. It was also fascinating, listening to them when they shared their data and conclusions as the way they expressed themselves improved and their vocabulary became richer.

As some experiments were carried out, students could not understand the importance of repeating them. It was hard to let them realize that the more times an experiment is repeated, the more reliable the data will be. For some groups this task was simple, since they gathered a good collection of data and they made sure that the experiments worked well. However, it was demotivating for those groups that did not get conclusive data. For this reason, different debates were held, so all the groups could reach the same conclusions. Returning to the results obtained by the test, we can see that the percentage of students who liked to repeat the experiments increased by more than 25 % in the experimental group. On the contrary, this question is not meaningful for the students of the control group since they have not performed any experiments.

Using new methods provide students different ways to achieve knowledge. In this sense, new approaches were facilitated for developing the experiments. Children could benefit from this aspect and saw its usefulness as almost three-quarters of the class agreed on enjoying using new methods. Once again, the results in the control group cannot be contextualized as they did not perform anything related to the scientific method.

When carrying out experiments, hypothesis is the fundamental pillar of this approach. Furthermore, it is very beneficial for children when they discover different results than the expected ones, and the importance of reporting them. As the last question exposes, at the beginning of the academic year only 14.28 % of the students in the experimental group could realize about this issue. Fortunately, at the end, an improvement of the 44.34 % was noticed. This result means that learners appreciate everything that takes place during the process.

In all the results of the collected data, an improvement was shown in the experimental group after the method was started up. In contrast, the control group showed a lower performance in all these aspects since, although they carried out a cooperative work methodology, they did not carry out any activity presented in the scientific method. At this point, it is also important to make a brief reflection about the need of supporting at home what students

work and create in the school. That is why it has been decided to analyse the data if they wish to continue performing these experiments at home.

Table 8
TOSRA TEST RESULTS: Extrapolate the subject to their homes

16. I would like to do science experiments at home.					
Experimental – Pre-test	53.57 %	17.85 %	10.71 %	3.57 %	14.28 %
Experimental – Post-test	68.96 %	3.44 %	13.79 %	10.34 %	3.44 %
Control	80 %	4 %	8 %	0 %	8 %

When conducting experiments at home, this table reveals that there is a slight improvement in the results obtained in the post-test of the experimental group, from 53.57 % to 68.96 %. At this point, it is curious how the control group showed more enthusiasm, as the 80 % of the students agreed on this issue. It is true that the students in the control group were a bit discontented to see that the experimental group was doing more dynamic and meaningful activities than theirs.

Table 9
TOSRA TEST RESULTS: Conceptions about Science and IBL

19. Science lessons are:		Lots of fun	Boring
Experimental – Pre-test		50 %	50 %
Experimental – Post-test		96.55 %	3.44 %
Control		60 %	36 %
20. Doing experiments is		Better than reading about them.	Worse than learning things from the book.
As good as finding out information from teachers.			
Experimental – Pre-test	53.57 %	35.71 %	10.71 %
Experimental – Post-test	17.24 %	79.31 %	3.44 %
Control	52 %	44 %	4 %

On the one hand, the students' opinion at the beginning of the academic year was really divided in the experimental group, as half of the class thought that Science subject was boring in contraposition of the other half of the class that thought that it was lots of fun. At the end of these four months, their conception regarding the science subject improved more than considerably in the experimental group, from 50 % to 96.55 % and in the end, everyone thought that the classes were fun except for one student. Some of their reflections were the following ones: «because we do experiments, we discover new things, we draw mind maps and excursions», «I like science because we make experiments, we have fun and we play games».

The last question of the test had three possible options where learners had to choose the one that most reflect their thoughts when carrying out experiments. In the experimental group, most of the children thought that it was better than reading about them (79.31 %) proof of this, are some of the observations that left reflected in the test; «making experiments is better because we discover things by ourselves» other reflected «I like doing experiments more than reading because when we read we do not do anything fun, when we do experiments we discover things».

4.3 Students' interviews

After the interviews took place, I could realize how important this tool was as students were willing to answer all kinds of questions. They felt somehow important to be heard and it let me collect data that until that moment had not been reflected on the tests or in their notebooks. Eighteen parents authorized me to interview their children, but I could only do it with six children that were randomly selected through the method previously explained in Procedures section (3.3). The interviews were administered with audio recording and they could choose the language in which they felt more comfortable; five of them preferred to do in Spanish and only one in English.

In general terms, the implication of families and students in this school could be seen as very positive due to they are willing to take part in new methodologies. Taking this into account, eighteen families authorized me to carry out these interviews, that were handled within three days. However,

having had more time, I could have interviewed all of them. The interview consisted of eight questions that were carefully chosen with the intention of exploring how the scientific method was worked and if they felt a real connection with it. The questions suffered minor variations according to the answers they were giving. Once the interviews were recorded it was observed whether or not they had problems when answering them.

The audiotapes transcripts presented that the interviewed appeared to be pleased with the inquiry experience. After analyzing the transcriptions, it could be appreciated in the moment they were asked about how they felt about doing experiments, they used optimist expressions to expose their feelings. Some of the student's answers were: «I feel very good, I feel as a real scientist». We may assume that these tasks are meaningful to them and are contextualized as they have been given the opportunity to put themselves in the scientists' shoes. Throughout the questions, they could reflect on some steps that were carried out when developing different tasks. Although the scientist method has not been taught in detail, with its steps and procedures, children have been able to extract the most important ones from the activities that have been done inside and outside the classroom; «analyzing and comparing the data, observing what happens during the process, we have to measure all the things that we have to measure, to agree on something, analyze things, observe something that happens in the nature» All of these aspects are related to each part of the 5E learning cycle.

Another critical issue in the interviews was the importance of working in groups and sharing the results we get throughout the implementation of IBL in my classroom. New opportunities to work in groups have been increasing progressively since September through collaborative research and projects. Some reflections in the interviews let us suppose that they are able to see a benefit to group work «you don't know if other people got the same result as well» and «other people deserve to know it and if they are wrong so... can we correct it all together». They felt the need to compare the results and their hypothesis in order to see whether or not they were right, and they also realized about the importance of letting people know the advances they were doing. These students' reactions to inquiry-based experiences produced an increasing in participation and developed positive attitudes since the beginning of the study.

5. CONCLUSION

Throughout this study, the main purpose has been the observation of the impact that the Inquiry-based method has had on my students' conception. Over this period of sixteen weeks, different tools of data collection have been taken into account in order to establish some conclusions. In September, 29 learners in the experimental group were brought into the study by filling out the TOSRA pre-science attitude test. In the following weeks, different tasks and activities were carried out in order to engage critical thinking and problem solving through posing questions, some of them by the children and others by the teacher. Towards the end of this study, a post-test was administered with the intention of comparing the results obtained from the pre-test. At the same time, a group of 27 students with similar abilities were designated as the control group who were taught based on a traditional methodology. This control group also performed the TOSRA test. The data was then analyzed to find patterns according to the research questions.

What are the main difficulties when implementing IBL to teach Science through A Foreign Language? A survey completed by 38 teachers working in different educational environments, was the main tool that showed teachers' perceptions of scientific inquiry. This study discovered an obvious tension between what our National curriculum states as its objectives for Science teaching and what the main difficulties that teachers encounter when they have to implement these objectives in the classrooms. The answers imply that these are the main factors that hinder the implementation of IBL in our schools: this method may be time-consuming (3.58), it also requires an investment in materials by the school (3.32), teachers demand specific instruction throughout their training (2.97) and this impacts on their knowledge, as they are not sure how this method really works (2.26). Some measures to implement this scientific method in our schools would begin by including a specific curriculum in the universities, increase the time provided for teaching in this area in schools, and the necessary means for putting into practice this method should be provided by the schools.

Can IBL change and improve students' conception of Science? These findings suggest that the implementation of IBL in Science lessons

has had a measurable impact on both student participation and satisfaction. This indicates that the shift to inquiry-based learning has improved the learning outcomes. In contrast to what was observed of the control group, since they continued to be immersed in a more traditional method. In the light of these results, there is a significant difference between the achievement levels of the students who have taken part in the IBL supported by the 5E learning cycle (the experimental group) and the students who have been taught following the baselines of the traditional teaching methods (the control group). Their motivational levels are completely different as well as their level of participation, something that directly impacts on their levels of achievement. These findings also highlight the importance of incorporating student-centered methodologies in the lesson planning by providing them with opportunities to formulate and explore questions through their immediate environment.

Can IBL develop the scientific method? Thanks to the implementation of different activities throughout the weeks of this study, it has been observed how children developed their scientific skills in different situations. Although the steps of the scientific method have not been taught theoretically, the students have been able to extract the most important steps since they have applied them in practice. It was observable, through the data analyzed in the interviews, that this was the result of the improvement of their attitudes as well as their motivation to take part more in different lessons, resulting in the improvement of their ability to observe their immediate environment and pose questions.

Finally, some of the limitations of these outcomes may include the IBL method only being implemented in the Natural Sciences subject from one third grade classroom. Secondly, it was agreed that at the beginning both groups (experimental and control) were going to be taught according to the Inquiry-based learning method. However, the other teacher preferred to follow the book as the main resource of the subject due to the amount of time needed to carry it out properly. That is why; the group of 27 children were taken as the control group. Moreover, the TOSRA test was modified and shortened by the researcher and it was focused on the areas considered significant to the study.

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The Benefits of Implementing an Extensive Reading Program to Increase Vocabulary Acquisition in the Bilingual Classroom

Beneficios de implementar un programa de lectura extensiva para mejorar la adquisición de vocabulario en la clase bilingüe

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Abstract

Extensive reading has widely proven to be of benefit for EFL learners, but little research examines the use of original books in primary education. This paper displays a research carried out to find the benefits that implementing an extensive reading program has on vocabulary acquisition and communicative skills improvement in a 3rd and a 4th grade classroom in a bilingual primary school in Madrid. By way of comparing pre and post tests that measure percentage increase of control and target vocabulary use, findings support this approach in favour of a traditional textbook one, from which control words were extracted.

Key words: extensive, reading, vocabulary, skills, primary, bilingual.

Resumen

La lectura extensiva ha demostrado sus beneficios en los estudiantes de inglés como lengua extranjera, pero apenas hay estudios que examinen el uso de libros originales en primaria. Este estudio muestra una investigación para descubrir los beneficios en la adquisición de vocabulario y destrezas comunicativas de implementar un programa de lectura extensiva en 3^o y 4^o de primaria bilingüe en Madrid. Al comparar pruebas previas y posteriores que midieron el aumento porcentual del uso de vocabulario control y experimental, los resultados favorecen este enfoque frente una metodología tradicional con libro de texto, del cual las palabras control fueron extraídas.

Palabras clave: extensiva, lectura, vocabulario, destrezas, primaria, bilingüe.

1. INTRODUCTION

English teachers around the world are constantly in the search for better methods to help students acquire the foreign language. While no one method has proven to be above all others, Matamoros-González et al. (2017) point out common denominators that account for what one may call effective teaching. In their study, four outspread methods for teaching were compared: the grammar and the audiolingual methods, as well as the communicative and natural approaches to teaching a foreign language. Out of 51 items compared in a checklist created by the authors, the use of books was the only common denominator, since all methods and approaches highlighted the importance of reading and providing learners with reading materials.

From the grammar translation method, which heavily relied on original texts to instruct vocabulary, to more modern language learning approaches, such as the communicative approach (Canale & Swain, 1980) or Content and Language Integrated Learning (Marsh, 2002), literature has walked hand in hand with the teaching of English. However, the question remains regarding how intertwined using literature should be with the formal instruction of a language, or whether there should be no distinction at all.

In tertiary education, the use of literature in the classroom is widespread. However, Ortells (2013) argued that in Spain's secondary schools «literature is relegated to a virtual non-presence» (pp. 91-92). In search of articles regarding the use of authentic literature and/or extensive reading in primary education in Madrid, or even Spain, literature was not found. One may say that teachers in Madrid still hesitate to carry out programs based on extensive reading for a number of reasons, the real, unfiltered use of the language being the main one. In my experience, I have encountered few teachers that included extensive reading in their syllabus. Nevertheless, especially in bilingual schools, where teachers are aiming for students who can understand and communicate fluently in English, extensive reading of authentic books seems to be an exceptional opportunity to expose students to genuine language from a very early age.

The scarcity of studies is surprising insofar as the benefits of using literature to teach and learn English as a foreign language have been widely dis-

cussed in the past years. Khatib (2011) lists the benefits of literature in EFLT, among which are authenticity, motivation, cultural/intercultural awareness and motivation, intensive/extensive reading practice, sociolinguistic/pragmatic knowledge, grammar and vocabulary knowledge, and language skills. In this vein, Hunt and Beglar (2005) discussed that extensive reading was one of the most valuable implicit lexical instruction strategy to increase vocabulary size in EFL learners, and that «for extensive reading to be effective, learners must be regularly exposed to large amounts of comprehensible text» (Hunt & Beglar, 2005).

This led to the following research questions: Could the reading of authentic literature be applied in primary education? More precisely, could extensive reading prove to have benefits for the learning of EFL in primary education? Could the reading of authentic literature be worth the effort if it increases student engagement and/or academic results? Could reading help students achieve better results than following a traditional Spanish textbook approach? Linked to this, could reading be a better tool for vocabulary acquisition?

In this light, the objectives of this research include scrutinizing the increase of vocabulary students meaningfully acquired by way of extensive reading vs. the one they learnt via a textbook approach. Secondly, the study also aims to look at the development of students' reading comprehension skills. Hence, this study first starts with the hypothesis that these variables will in fact affect student achievement in a positive way: that the use of extensive reading of authentic books will have a better effect on student achievement in general and in vocabulary acquisition in particular than if only learning via a textbook designed for Spanish EFL learners; and that authentic literature will not hinder student learning but will, on the contrary, help motivation, engagement, and ultimately, academic improvement.

2. LITERATURE REVIEW

The present study takes as a departure point a blend of approaches and methods that can be said to be key for teaching English successfully in the 21st century.

2.1 The teaching of English: reading skills within the development of students' communicative competence

To start with, there is a need to reflect on the building blocks of the Communicative Approach. In Canale and Swain (1980) it is stated that

it is especially important that the more arbitrary and less universal aspects of communication in the second language (e.g. certain features of the grammatical code) be presented and practiced in the context of less arbitrary and more universal aspects. (p. 28)

As Richards and Rodgers (2014) pointed out, some of the Communicative Approach's principles include linking the different skills such as speaking, reading, and listening together, since they usually occur together in the real world, and letting students induce or discover grammar rules (p. 95).

Teaching English through literature is necessarily associated with text-based instruction. More precisely, Richards and Rodgers (2014) argued that, regarding text-based instruction «communicative competence is seen to involve the mastery of different types of texts» (p. 200). Ergo, understanding the features of a text type will allow the student to learn norms of language and writing style related to that genre. In this study, students were formally introduced to some linguistic features of narrative texts. Students were able to recognize them and later on, produce them.

All in all, Richards and Rodgers (2014) argued that «the objectives of a text-based course are linked to the contexts in which the learner will use English» (p. 204). Furthermore, they added that central to all activities in a text-based course is «the focus on the nature of an authentic text, what its purpose and features are, and how it reflects the context of its use» (p. 206). In this vein, Krashen (1982) argued that meaningful reading experiences are more likely to lower students' affective filter, which in turn favours the acquisition of the foreign language.

The teacher's role in an extensive reading course in an EFL setting has much to do with scaffolding. Swain, Kinnear and Steinman (2010) defined scaffolding as classroom interactions where «one person (e.g., the teacher or another learner) has more advanced knowledge than the other» (Richards & Rodgers, 2014, p. 28). For scaffolding to be effective, it has to be able to be removed because the student has accomplished the goals

thanks to this help. Where extensive reading is involved, scaffolding is an essential tool the teacher has to introduce to help students overcome linguistic, contextual, and grammatical barriers. In the present study, scaffolding was thoughtfully introduced in every lesson and when reading every chapter of the selected books, and it was a fundamental piece for the success of the project.

2.2 Teaching through literature: approaches

There are plenty of approaches to using literature in the EFL classroom. Maley (1989, cited in Khatib et al., 2011) introduced two approaches: the «Critical Literary Approach» and the «Stylistic Approach». The first one focused on the literary features of the text. The Stylistic Approach highlighted the importance of both the text as a language model and the need to understand it in order to grasp the literary value of said text. For primary students learning English as a FL, the second one seems to appeal more, as they would need to have a certain command of literary features and an advanced level of the language in order to benefit from the Critical Literary Approach. Besides, the Stylistic Approach blends learning language and literature.

Carter and Long (1991, cited in Khatib et al., 2011) developed three models: the «Language Model», the «Cultural model», and the «Personal Growth Model». The Language Model achieves literary understanding through the study of the language. The Cultural Model (or Literature as Content) uses literature as a vessel to access cultural understanding. The latter one stands out as the most interesting, due to its integration of language, context and motivation.

Lazar (1993) described three approaches: «Language-based approach», «Literature as content», and «Literature for personal enrichment». The first one would relate to the approach taken with the group of students in this study, where «literary texts are seen as a resource –one among many different types of texts– which provide stimulating language activities» (p. 27). Nonetheless, although a language-based approach is interesting for young learners, focusing on the language too much can take away from the literary and reading appreciation of a book.

However, it seems to me a necessary scaffolding step to help young learners be autonomous readers in the long term, in addition to being the appro-

appropriate method for a primary classroom where the main curricular goals point in the direction of language learning. «Literature as content» would be appropriate in more advanced courses or tertiary level literary degrees. As for 'Literature for personal enrichment', it is of course a desired goal that teachers can work towards by means of the other two approaches. In the last few decades, an integrative approach is preferred.

Now that approaches to teaching literature in general have been contrasted, a look into extensive reading becomes necessary. To start with, the present study focussed on extensive reading because of the global experience it offers to students. The students in this study were not used to reading extensively, being intensive reading the norm in their previous courses. Reading a book for a longer period of time allowed them the opportunity to make language connections and appreciate the value of learning English in order to be able to understand and enjoy literary texts. Global reading comprehension was constantly checked while they were reading, and grammatical features that students were getting familiar with at the time (such as the use of the past) were pointed out in the book, thus connecting what students were studying in class with authentic language use.

Looking expressly at vocabulary acquisition, extensive reading is proven to help tremendously, and Pigada and Schmitt (2006) argued that it should be an indispensable dimension of vocabulary teaching because both vocabulary acquisition and reading occur simultaneously. When learning vocabulary through lists, as it generally happens when using textbooks designed for FL language learners, students have difficulty retaining the words. Even though this direct way of introducing concepts is apparently fast and efficient, and students comprehend the vocabulary quickly (especially when the words are accompanied with images), they forget them easily, and it is with difficulty that they become part of their lexis and they independently use them in separate contexts.

Furthermore, several authors argue in favour of teaching EFL through reading. Some advocate for the authenticity of the language used, versus the use of adapted books. While the latter usually provide a clear, simple language model, they lack the genuine use of language with its richness in connotations, culture and intention. Floris (2004) highlighted the language and cultural enrichment literary texts provide, as well as the higher level

of involvement needed from students, for ‘students are required to engage in «content-based purposeful learner talk in English» (p. 3).

In addition, Khatib (2011) offered ten recommendations for integrating literature in the language classroom. Most related to this study are: «2.1. The teacher should work for learners’ personal involvement with literary texts...; 2.5. Teachers should consider the accessibility of literary texts for their language classrooms...; 2.6. The four language skills (listening, speaking, reading, and writing) should be integrated...; 2.8. The teacher should provide scaffolded assistance with literary texts...; 2.9. The teacher should encourage and facilitate group discussions» (pp. 259-262). In this regard, this study offered students with engaging tasks to become active agents of the reading experience, they worked with a physical book of which each student had a copy of, and they had opportunities to talk about the plot, characters and other features of the story. Finally, the teacher scaffolded tasks to help vocabulary acquisition that at the same time encouraged the practice of the four skills: listening, speaking, reading and writing.

When considering using extensive reading in the EFL classroom, one must make a choice between graded readers or authentic texts. Graded readers provide language that has been specifically selected for English learners. Original books will usually expose children to larger amounts of new vocabulary and uses of English. Moreover, original, authentic texts contain the literary and cultural value that most agree is partially or completely removed from graded readers. Both types of books have a valuable place in the English classroom, and a blended use of them will likely balance language needs to bring a full learning experience to the classroom. However, the present study has focused on vocabulary gains through extensive reading of original books, so as to evaluate if their implementation in primary classrooms in bilingual schools should be recommended.

One cannot move on without considering some difficulties of using authentic literature in the classroom: the use of ungraded language and cultural differences. The teacher becomes an essential filter for two objectives: first, to carefully select the text so that language is not too far away from their students’ comprehension level, and second, to apply measures to get students closer to cultural understanding and enrich-

ment. This present study includes all the scaffolding, remedy work and linguistic support that students' need to be provided with in order to make a literature course successful.

3. METHODOLOGY

3.1 Context

The present study was carried out in a public bilingual school in Madrid. In an effort to improve students' linguistic and communicative competence, the school is in the midst of a three-year project to change its methodological line in the English lessons, attempting to transition from a textbook based curriculum to a four skills based one. Moreover, extensive reading is progressively being implemented in all primary levels.

The main study group was composed of 23 students in the 4th grade class. Two students were excluded because they follow the 2nd grade curriculum due to their specific needs. Out of the 23 students, three of them had special needs, but followed the 4th grade curriculum. Around 45 % of the students in this study group struggled in all or most areas, and most of them have little support regarding their schooling at home. The minor study group was composed of 21 students in the 3rd grade class, two of whom had special needs. This group had overall better academic results, and parent involvement was also higher.

Out of the 4 lessons per week, 3 were dedicated to following the textbook and other types of activities. The remaining lesson was focussed on extensive reading and all tasks related to the books and this study, including the data collection tasks and measurement tests. A language assistant was present in some of these lessons.

3.2 Methodology

To start introducing 3rd and 4th grade children to extensive reading and vocabulary acquisition through it, students were exposed to a variety of books all along the year. Students read at home an average of a book in English every two weeks, and they produced oral and written reports about them.

The books for this study were carefully picked out after months of research. The criteria behind choosing them followed Hill's (1986): (a) the needs and abilities of the students; (b) the linguistic and stylistic level of the text (especially: vocabulary and text structure within the students' scope; slang, dialect and highly idiomatic language at a minimum); (c) the amount of background information required for a true appreciation of the material (p. 15). I also thought about the amount up to which the books could connect with the students' lives and interests, and the attractiveness of the plot and the characters. The resulted selected titles were two books intended for children who are native speakers of English.

- 4th grade: *Eerie Elementary*, by Jack Chabert. (Scholastic).
- 3rd grade: *Game Over, Super Rabbit Boy!* by Thomas Flintham. (Scholastic).

Regarding the fact that these titles are not classic titles, even though the literary canon is usually basis for schools' reading curriculum, the Spanish law does not set a list of books for primary education. Furthermore, given that students in this study have approximately an A1 – A2 English language level according to the European Framework, finding an original book that was also a classic but was not too difficult or culturally out of their knowledge was highly challenging.

3.3 Design of the study

This study started taking place during the second term. Each lesson was dedicated to the reading of one chapter. Lessons followed a careful structure.

At the pre-reading stage, the main goal was to arouse students' interest and to overcome any vocabulary barriers that could potentially pose a problem for the global understanding of the text. Some of the activities that took place were: presentation of vocabulary words, sensory activities, looking at pictures or presentations, eliciting the new plot, finding key words in the chapter, remembering the plot, describing the characters, etc.

At the while-reading stage, reading took place mostly as a whole-group activity. Each chapter was read twice, combining different techniques: teacher reading the whole passage to the class, teacher narrating and selected

students reading the dialogues, students reading out loud in turns, silent reading, language assistant reading to a small group, students reading to each other in small groups, students reading while interpreting, etc. On the second reading, attention was brought to elements of interest to the story to reinforce vocabulary, to highlight the use of certain structures, or to discuss character or plot development. Students were also asked questions to double-check understanding.

At the post-reading stage, tasks were designed to aid students incorporate the new vocabulary and to check reading comprehension. Written and oral tasks, activities and games were used to change the focus into a productive skill. Some of the tasks included: writing descriptions, using the new vocabulary in sentences, summaries and paragraphs, drawing parts of the plot or characters, acting out, role-plays, recreations, glossaries or picture dictionaries of words, etc.

3.4 Data collection

Data was collected by measuring the amount of vocabulary acquired by students. The decision to measure success in terms of vocabulary acquisition was based on the importance of lexicon for understanding and communication. Duppenhaler (2007) argued that the lack of vocabulary can be an obstacle to good reading. He also compared explicit and implicit instruction of vocabulary, concluding that the best idea is to combine both. In this study, vocabulary was taught both ways, and a wide variety of tasks and activities for the teaching of vocabulary were implemented.

Data collection started in March 2021, when extensive reading began and the pre-tests took place, finishing at the end of May 2021, with the gathering of the last data. The data was collected via a free writing test, which served both as a pre and post study test, in which students were required to recall and use in context as many words as they could. They were provided with a set of pictures intended to spark the connection with the studied vocabulary.

The study collected data for two main purposes: (1) to gather conclusions on the amount of target vocabulary students acquired at the end of the study. This data was measured against the control vocabulary students acquired through the textbook course, and findings were measured in

percentage of increased use, to check which group of words students had learnt better; and (2) to see how much each skill had improved during those months, and which skills students had progressed more in: listening, reading, or writing. Students' speaking skills were not assessed in this study.

Apart from this formal data collection, mid study formal and informal tests were carried out during March, April and May, to scaffold students' learning. These tests measured vocabulary recognition, naming, and guided production. In comparison, one may say that the pre and post-tests assessed vocabulary acquisition at the highest thinking level, for students were not shown any written clues.

3.5 Work plan

The chronological order of the study was parallel for both study groups. February was dedicated to introducing the books and their topics, and to carrying out introductory activities to arouse the students' interest. These activities worked well as all students were eager to start reading the books. At the beginning of March, pre-tests were taken. Extensive reading, which started in March as well, lasted until late May, when both books were finished and the post-tests were taken. Throughout the study, several remedy activities and tests, as well as motivational tasks were executed. *Table 1* shows an overview of the project's timeline.

Table 1
Study's timeline

FEBRUARY	MARCH	APRIL	MAY
<i>Introductory activities</i>	<i>Pre-tests for target and control vocabulary</i>	<i>Remedy tests</i>	<i>Post-tests for target and control vocabulary</i>

Table 2 and *Table 3* show a detailed view of the chronological work plan for each age group. In them, chapter reading distribution can be seen, along with motivational and vocabulary activities. In addition, dates for pre-tests and post-tests are displayed.

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Table 2
3rd grade timeline

3 rd grade timeline	FEBRUARY	MARCH	APRIL	MAY
CHAPTERS READ	Chapters 1-2	Chapters 3-4	Chapters 5-8	Chapters 9-11
ENGAGEMENT ACTIVITIES	– Introduction to the book and the topic	– Acting out	– Acting out – Writing to the authors	– Acting out – Role plays and recreations
VOCABULARY REINFORCING ACTIVITIES	– Working on the characters – Specific study of vocabulary	– Specific study of vocabulary – Small group work with language assistant	– Specific study of vocabulary – Writing practice – Small group work with language assistant – Remedy test	– Specific study of vocabulary – Small group work with language assistant – Remedy test
TESTING		– Pre-tests (vocabulary)		– Post-tests

The table for 4th grade’s timeline (*Table 3*) is practically the same, except for the difference in chapters read (this book had more chapters and they were longer).

Table 3
4th grade timeline

4 th grade timeline	FEBRUARY	MARCH	APRIL	MAY
CHAPTERS READ	Chapters 1-2	Chapters 3-6	Chapters 7-11	Chapters 12-15
ENGAGEMENT ACTIVITIES	– Introduction to the book and the topic	– Acting out	– Exploring the school – Writing to the authors	– Role plays and book recreations
VOCABULARY REINFORCING ACTIVITIES	– Vocabulary about schools in the USA	– Character description – Specific study of vocabulary – Small group work with language assistant	– Specific study of vocabulary – Writing practice – Small group work with language assistant – Remedy test	– Specific study of vocabulary – Small group work with language assistant – Remedy test
TESTING		Pre-tests (vocabulary) – Pre-test Cambridge A2 flyers		Post-tests (vocabulary) – Post-test Cambridge A2 flyers

3.5.1 Pre-tests

On the one hand, vocabulary acquired through extensive reading was named «Target vocabulary». This vocabulary was learnt as the extensive reading lessons happened once a week. Pre-reading, while-reading, and post-reading activities reinforced the new target vocabulary. On the other hand, vocabulary acquired by means of the textbook was labelled «Control vocabulary». This vocabulary was the one with which the target vocabulary was to be compared with. This vocabulary was learnt in two or three lessons a week, when extensive reading or other school activities did not take place. The control vocabulary was part of the official school syllabus that follows a specific textbook designed for Spanish children who are EFL learners. 3rd grade control and target vocabulary lists consisted of a total of 30 words each. 4th grade control and target vocabulary lists had 40 words each, taking into account that this study group had a higher English level than the first one. All vocabulary was learnt during a three-month period, between mid-February and mid-May. Target and control vocabulary was chosen due to its relevance.

The pre-tests in both cases consisted of a free writing in which students were asked to make up a story based on a set of pictures. The pictures were carefully selected to elicit the key words. Pre and post-tests were exactly the same, so as to have a valid source of comparison at the beginning and at the end of the study.

Secondarily, a listening, reading and writing test was conducted in 4th grade at the beginning and at the end of the study. The objective was to decipher what skills students had improved in more during those weeks. The selected test for this was *Cambridge A2 Flyers*. Since literature is said to improve the four skills (Shamsur & Alasmari, 2018), it appeared of interest to look at how much student had gained in each skill.

Regarding listening skills, most of the reading took place in read-aloud sessions, both by myself, in storytelling fashion, and by other student peers. As for reading skills, it goes without saying that a correctly implemented extensive reading program should build up on students' reading comprehension skills and will enhance their motivation and love for reading. With reference to writing skills, it was implied that readers would pick up on certain basic writing features of narration. This was looked at in the evolution

of the free pre and post writing tests students sat. The minor study in 3rd grade did not measure the degree of acquisition of these three skills through formal testing, as students were considered to be too young and unfamiliar with this type of test.

3.5.2 Remedy tests

Amid the study, both formal and informal remedy tests were executed to ensure students were progressing in their vocabulary acquisition and reading comprehension skills, and when specific difficulties were observed. More precisely, the informal remedy activities included oral vocabulary games, such as *Taboo* and *Pictionary*, interactive games, such as jeopardy, and small group work with both the teacher and the language assistant. Students were alternatively grouped in both mixed and same ability groups to provide them with diverse learning opportunities.

Formal tests measured students' ability to recognise, name, define, and use key words. They also included extracts from the book with comprehension questions. The correction of these tests allowed deciphering what aspects of vocabulary acquisition students were struggling with the most so that further measures could be implemented. These further measures encompassed asking struggling students to create picture dictionaries and doing individual or pair oral review activities with the language assistant. Each students' specific needs were taken into account and activities were personalised to help each of them overcome their obstacles.

3.5.3 Motivational activities

Not all activities done throughout the extensive reading program had a testing connotation. In fact, it was deemed crucial that students liked the books they were reading if the program was to be successful. Since sometimes students show a lack of motivation towards reading, motivational activities were implemented to prevent possible negative attitudes from students.

In the study groups, intrinsic motivation prior to the study varied, depending mostly on whether students enjoyed reading or/and English before starting the extensive reading program. To boost motivation in all students, extrinsic motivation techniques were constantly applied.

From the beginning, a number of motivational activities were executed. All of them proved to be great motivational tools. Out of the four English lessons a week, the reading lesson was without a doubt the one student expected and longed for the most. Often, when following the course book, students needed the teacher's help to remember the last topic of study, and warm-up or recalling activities were needed in order to get them back on track. Contrarily, students would often ask at the start of the reading lesson what activities we were going to do that specific day. They would also clearly recall what chapters we had read last, and found it easy to explain to their peers what the last chapters had been about.

One of the recurrent engagement tasks was the use of role-play and drama in the classroom. Students would engage in acting out as different characters, recreating scenes, making voices, moving and jumping around the classroom or miming while the teacher or another student narrated. Students would also role-play characters from the stories, taking the plot as a departing point to explore different aspects of their traits. In addition, another objective was to bring the story to life. Allowing the students to emulate the plots in the book provided an immersion, which in turn resulted in better student engagement. Another motivational activity used along the reading of the book was the use of sensory effects in the classroom. Background music for sound effect was regularly played while the class was reading the chapter as a whole group. An ambience would be created according to the atmosphere in the story, so that students would be immersed in the plot. Visual effects like dimming the lights or adding props that appeared in the book were highly valued by students, who openly showed their excitement to be involved in the «adventure». Visual aids were shown as well, mostly to present new vocabulary items.

Presumably, the most potent motivational activity was to contact the book authors. Students took hold of this opportunity, recognizing in it the chance to level up their writing skills to be able to connect with the author, and they enjoyed the excitement of writing and sending the authors real emails. When one of the authors answered, the message delivered to children about reading and learning English was powerful beyond the words it contained.

3.5.4 Post tests

The final test aimed to check the amount of vocabulary acquired by students through the textbook course vs the extensive reading course. For that purpose, the same open story tests as in the pre-test were offered. When they happened, students did remember the structure of the task, i.e., they knew they had to use the pictures to create a story. However, they expressed to barely remember the pictures themselves, let alone the stories they wrote in the first place, at the beginning of the study. Both the control and target vocabulary acquired and the percentage of improvement were measured. Results were contrasted to extract conclusions. As explained in *section 3.5.1* of this paper, pre and post-tests were repeated, so as to have a valid source of comparison at the beginning and at the end of the study.

Lastly, post-tests for listening, reading and writing comprehension were done in the 4th grade study group. Again, 3rd grade did not participate in this data measurement for the reasons explained above. The listening test was presented to students in one session, while the reading and writing was done in a different day, for time management reasons.

4. ANALYSIS

4.1 Data Analysis: Procedures

The data analysed was the number of control words and target words acquired at the end of the study by students in both study groups. This was analysed in two ways. First, the average percentage of control vs target words used at the end of the study was measured. Secondly, and perhaps more interestingly, the average percentage of increase of both control and target words was measured to decipher which group of vocabulary words had been best acquired by children: the words studied through a traditional direct approach to vocabulary teaching, or the words studied through an extensive reading program.

To measure how many words students could use, they were asked to create a story based on a set of pictures. The pictures were selected to stimulate the use of all vocabulary words. Free use of vocabulary words is one of the most challenging activities students can carry out to demonstrate the acquisition of vocabulary. «Creating» is a HOTS (High Order Thinking Skill) according

to Bloom’s Taxonomy revision (Anderson & Krathwohl, 2001). If students are able to design original products, it means they can understand, remember, apply, analyse, and evaluate the vocabulary they are working with.

Words were labelled as correct taking into account that students could use them in sentences that showed understanding and contextual use of the lexicon. Spelling mistakes were not taken into account unless they changed the meaning of the word or made it utterly illegible. Each correct use of the control or target vocabulary was only counted once, even if students used it repeatedly in their stories.

4.2 Data analysis: Findings

4.2.1 Vocabulary acquisition

Before analysing the findings in the pre and post-test performance comparison, it must be noted that mid-study remedy tests were pointed in the direction of helping students recognise and independently use vocabulary words. Mid-study remedy tests showed that students in 4th grade were good at recognising words, but struggled with producing the words without help. Some students also had difficulty when answering reading comprehension questions. In 3rd grade, students were better at reading comprehension and word recognition, but struggled when having to define words. These obstacles were overcome through small group discussions, reinforcement and expansion work.

As for the findings related to vocabulary acquisition, results can be observed in the following tables. Information has been broken down to make it clear to the reader:

Table 4
3rd grade Control vocabulary acquisition

3 rd grade		
Control vocabulary		
Average percentage of vocabulary used at the beginning of the study.	Average percentage of vocabulary used by the end of the study.	Average percentage of increase of use of vocabulary words.
10,16 %	16,03 %	5,87 %

As displayed in *Table 4*, control vocabulary had little increase in this three-month period. Despite the fact that there is an increase, and that this is always positive, one must reflect on why it is so small. Moreover, students tended to use different words, vastly because both in the pre and post-tests they recalled the most recently studied ones. This can lead into thinking long-term retention was not generally spread.

Table 5
3rd grade Control vocabulary vs Target vocabulary acquisition

3 rd grade					
Control vocabulary			Target vocabulary		
Average percentage of vocabulary used at the beginning of the study.	Average percentage of vocabulary used by the end of the study.	Average percentage of increase of use of vocabulary words.	Average percentage of vocabulary used at the beginning of the study.	Average percentage of vocabulary used by the end of the study.	Average percentage of increase of use of vocabulary words.
10,16 %	16,03 %	5,87 %	2,38 %	29,21 %	26,83 %

In *Table 5*, it is observed that the difference between control vocabulary and target vocabulary increase is significant, being it more than 20 %. What is more, students showed a more stable use of words, even of those who had appeared at the beginning of the reading program. One of the benefits of extensive reading is that vocabulary stops being isolated words, and becomes an integrated experience. Most vocabulary was mentioned frequently because the story was one unit, unlike the control vocabulary, which was presented in unlinked didactic units.

Let us take a look now at the results in the 4th grade classroom in *Tables 6* and *7*, where difficulty was slightly higher in all aspects:

Table 6
4th grade Control vocabulary acquisition

4 th grade		
Control vocabulary		
Average percentage of vocabulary used at the beginning of the study.	Average percentage of vocabulary used by the end of the study.	Average percentage of increase of use of vocabulary words.
4,67 %	9,67 %	5 %

Table 6 shows how control vocabulary showed little increase. The use of control words started as very low (4,67 %), and, although there was an increase of 5 %, it remained fairly low. In fact, the percentage of increase is almost the same as in the other study group. Patterns of students not recalling vocabulary from the beginning also appeared. All in all, results can be said to be parallel in both groups.

Table 7
4th grade Control vocabulary vs Target vocabulary acquisition

4 rd grade					
Control vocabulary			Target vocabulary		
<i>Average percentage of vocabulary used at the beginning of the study.</i>	<i>Average percentage of vocabulary used by the end of the study.</i>	<i>Average percentage of increase of use of vocabulary words.</i>	Average percentage of vocabulary used at the beginning of the study.	Average percentage of vocabulary used by the end of the study.	Average percentage of increase of use of vocabulary words.
4,67 %	19,67 %	5 %	4,67 %	24,89 %	20,22 %

Table 7 results are similar to the 3rd grade group. The difference between control vocabulary increase (5 %) and target vocabulary increase (20,22 %) is significant, being it more than 15 %. In only three months, students were able to independently use almost 25 % of target words (this percentage does not include words they could recognise or understand, which were more). As in 3rd grade, students had incorporated the lexis stemming from reading in the long term, and they were confident in using them independently in larger amounts than the lexis learnt via textbook.

As can be observed, predictions that pointed out that reading would enhance vocabulary acquisition were validated. Results are similar in both study groups. 3rd grade students showed an average increase of the use of control vocabulary of 5,87 %, vs a 26,83 % of average increase of target vocabulary use. 4th grade students showed an average increase of the use of control vocabulary of 5 %, vs a 20,22 % of average increase of target vocabulary use. For both groups at the beginning of the study, the difference of knowledge between control and target vocabulary was almost inexistent, whereas a big gap was clear by the end.

Language learnt through the authentic books extensive reading lessons was better acquired than that learnt by means of the textbook. This is due to the fact that language is not only a combination of words. To best learn a foreign language, the learner has to develop a deep connection with meaning. Immersing students in the world of a fantasy story created a learning environment where students felt motivated and wanted to learn the language needed to understand the story and talk about it. Moeller and Meyer (1995) argued that 'reading is a personal experience in a social context—exactly like language acquisition' (p. 37). On average, the students who struggled showed a similar increase in target vocabulary acquisition. No student shows a difference between increase of usage of control and target vocabulary lesser than 10 %.

Attention must be brought to the fact that the test measured vocabulary acquisition in its most complex forms. This accounts for the apparently low scores, compared to the total number of target and control words. Students showed understanding and recognition of most words in informal context, such as classroom questions and interactive games, but the pre and post-tests were designed to see which words students had incorporated into

their lexicon in a way that permitted them to use them independently. In addition, posts-tests proved that target vocabulary words that students were able to use were better distributed along the timeline, i.e. students had not forgotten words that were learnt at the beginning of the project.

Contrarily, post-tests for control words showed that most students used more frequently control words that had been recently learnt. This shows light into the importance of the meaningfulness of the language learnt in an English course. Extensive reading provided a context in which all the vocabulary was connected and students kept recycling words over and over. Per contra, the textbook presented control vocabulary words in separate Didactic Units that were not connected to one another. This compartmentalisation made it more challenging for students to make connections in their brain, and they unconsciously forget and move on to the next group of words once a Didactic Unit is finished. Furthermore, motivational activities greatly helped the reading program be successful. Emotional connections were done and students related vocabulary with experiences and tasks we had performed.

It can be then stated that reading helped students improve their lexis, and using authentic literature was not an impediment for it. In fact, it helped more than textbooks designed specifically for EFL, and results achieved were by far better.

4.2.2 Increase in skills performance

Let us look now at the secondary objective of this study in Table 8, which was to observe student increase in skills performance (listening, reading and writing) in the 4th grade class, which was labelled as the main study group.

Table 8
4th grade skills performance increase

4 th grade Cambridge A2 flyers testing: number of increase points (out of 10) between pre and post-tests	
Reading comprehension	0,52
Listening comprehension	0,50
Written expression	0,50

Results in reading comprehension increased slightly more, but not enough to be considered significant to the study. This can be due to a number of reasons: the big emphasis put on vocabulary acquisition along the extensive reading program or the lack of practice in different types of reading comprehension tests, for which students may not have been prepared. Still, these results can be looked at in another perspective: that an extensive reading program is a four-skill integrated long-term task that allows for the sustained improvement of reading, listening and writing.

Regarding writing, it was observed that students improved their writing creativity, which was transferred to other classroom activities and situations. However, significant gains in the use of grammatical features typical to writing narrations and extensive reading were not found. In this study, it was thought that the sole exposure to a specific text type of an extended period of time would affect the way students wrote after the study. Despite students being able to recognise basic connectors, the use of the past, or text division in paragraphs, overall students struggled to apply these features in their own writing pieces.

As for the development of listening skills, this extensive reading program involved a continuous practice of aural comprehension. Through the teacher reading aloud, students received a tremendous amount of input on word comprehension, pronunciation, and intonation. According to Renandya and Jacobs (2016), when EFL learners are «exposed to a large amount of language input, their word recognition skills improve, their vocabulary expands, their ability to process oral and written text fluently increases and their overall proficiency also goes up» (p. 1).

Nonetheless, some modifications could be applied to confirm better results in reading comprehension. As the reading comprehension tests were official ones, some students struggled with the format, even if the texts presented were appropriate for their level. When discussing them in class, students showed understanding of the texts, but still had trouble grasping the pattern of the activities they were required to do. The Cambridge A2 Flyers task configuration did not match the informal reading comprehension tasks done in the extensive reading program.

4.3 Outcomes

Introducing an extensive reading course into mainstream primary education is not simple and must be carefully planned out if it is to be integrated successfully into a school's curriculum. The role of the teachers becomes essential to ensure the texts are appropriate, meaningful, of decent literary value, and will, in fact, contribute to the improvement of students' command of English.

The outcomes of the study were satisfactory in that students did significantly improve the number of target words (vocabulary learnt via extensive reading) vs. control words (vocabulary learnt via textbook) they were able to use independently. The pre-tests and post-tests posed a difficult challenge of using higher order thinking skills, thus students needed to have a strong command of the vocabulary if they were to apply it in a free writing piece. This positive outcome leads to the conclusion that motivation and student engagement, as well as the relevance of the topic and the wholeness of the project, were key features for success. Working with a textbook, although it provides a structured curriculum, lacks in novelty and relevance. Language is presented in isolated words or chunks, and students hence study these language features as so, most of the time not incorporating the new words into their lexicon, as can be seen in the post-control tests.

By using authentic books, it can be seen that students' Communicative Competence is improved. Students can overcome language barriers when given the proper tools to do so. When guided, they can understand jokes, idioms, and other uses of language that are above their language level, and they remember the language learnt through reading in a greater way than when studying it from a textbook, because of the meaningful context and the emotional connection that is created. All in all, they acquire vocabulary and expressions in a meaningful way and are able to incorporate them into their lexicon in the long run. Furthermore, students feel empowered as they recognise their own effort in reading an authentic text. They were able to appreciate the difficulty of it and commented on how they felt ready to keep reading original books (for instance, as each book is part of a series, many students expressed how they wanted to keep reading the second book in the series). When properly engaged, students wait impatiently to

keep reading, and feel proud that they are achieving this accomplishment. Moreover, after carrying out extensive reading programs, students notice the difference between authentic and adapted books, and when given the option, most choose original books to read independently.

4.4 Plan of Action

Based on the findings, the recommended plan of action for the future includes two steps regarding the school curriculum design and the teacher's active role in it.

At school level, it is advisable to continue implementing the extensive reading program in all primary education in the school. This program should last one term in 1st and 2nd grade, 2 terms in 3rd and 4th grade, and the whole school year in 5th and 6th grade, and be applied one hour a week in all grades. The lesson dedicated to extensive reading will continue in the same line of work regarding vocabulary teaching through reading programs, due to the efficiency seen in this study, and language assistants will be included in the extensive reading program, given that they are a prized asset that is key to personalise learning. As for the other three hours of English lessons, the plan is to combine this reading program with textbook courses and skill-based lessons, but reducing the amount of time dedicated to decontextualized learning of language features of English.

At teacher's level it is also necessary to ensure teachers choose books that match their students' needs in terms of language level, literary value and student interest and motivation. After teachers decide literary materials, the next step will be to work on creating activities that help the development of students' reading skills in a more efficient and diverse way, so that they are able to anticipate and extrapolate their reading comprehension skills to other types of testing not directly related to the book they are reading.

Responsible to carry out this plan of action will be the bilingual coordinator of the school in close collaboration with the rest of the English teachers in the school, as well as the rest of the staff, should they want to jump on board in the project via other subject areas. It will be the responsibility of the English team to choose the books that will be read each

year, taking into consideration the precise characteristics of each cluster. Seeing that, in an informal way, this program is already taking place up to some extent, the timeline to apply it fully will be the next school year. Teachers will gather at the beginning of it to discuss and select books, and the extensive reading program will start in 5th and 6th grade in October. Flexibility on starting dates should be applied if students have difficulty getting a copy of the book.

Regarding resources and materials, apart from the book themselves, most tasks will be done in students' classroom notebooks, which makes it easier for families, since they are not required to buy extra school supplies. Worksheets or other materials that may emerge as necessary will be provided by the school. With reference to the language assistant, the bilingual coordinator of the school is the one who plans their schedule; therefore, arrangements must be made so that they will be present in the lesson dedicated to extensive reading.

5. CONCLUSIONS

The present study has intended to test the benefits of extensive reading of authentic books in the English as a foreign language classroom in a primary bilingual setting, in terms of vocabulary acquisition and, secondarily, of improvement of reading, writing and listening skills. It has also aimed at looking into the strengths and weaknesses of students' reading skills, in order to implement an improved reading program in the school.

Students' acquisition of vocabulary has been measured via comparisons between the acquisition of vocabulary through literature and through the textbook. The analysis has shown important gains in vocabulary acquisition through extensive reading. Additionally, in the 4th grade classroom students' improvement of listening and writing skills, which were not openly targeted in the study, versus their improvement of reading comprehension, have been assessed using standard Cambridge A2 Flyers tests. Regarding these three skills, quite similar improvements were made by students, reading comprehension not standing out particularly.

A complementary study has been carried out in 3rd grade, analysing most of the items from the main study class.

5.1 Implications

Extensive reading has proved, once again, a highly valuable tool for the EFL teacher and learner. This project has been of great interest for me as a teacher, the students, and the school community, as it will help open the way into a slightly different methodological approach that all teachers are looking forward to enforce.

Some concerns have appeared throughout the study. At first, having no control group who could shed light into how students gain vocabulary without an extensive reading program was seen as an almost impeding limitation. Due to the fact that this had no solution at all, the school only having one class per grade, alternative solutions had to be found. In the end, comparing different techniques used within the same classrooms, and comparing the evolution of two grades, allowed for a wide range of data, which in fact turned out to back up the results, displaying analogous results in both study groups. At the end, worries arose regarding how reading comprehension is being measured in the classroom and the school in general, and what more strategies students could learn. All things considered, three months seems a short time span. Pre, while, and post-tests sometimes happened with not a long time in between, which caused stress in some students, and others would have needed more time to settle and expand their knowledge.

This study will definitely have positive and helpful implications for other teachers who want to move on to a skills approach in primary education. Answering the research questions, reading has proved to help students in many dimensions of their language learning, and authentic literature has overcome its daunting name to be a better and more enjoyable way to improve reading and to increase vocabulary acquisition than traditional textbooks supposedly designed for that purpose. Students have enjoyed reading far more than traditional lessons, and they have felt proud of reading original books. In the end, they have incorporated vocabulary into their lexis that they now use confidently in a greater extent they do with the one learnt through textbook vocabulary lists, and extensive reading is to be thanked for that.

To conclude, the hypothesis expressed in the introduction of this paper, which was formulated as follows: that the use of extensive reading of authentic books will have a better effect on student achievement in general and in vocabulary acquisition in particular than if only learning via a textbook designed for Spanish children who are EFL; and that authentic literature will not hinder student learning but will, on the contrary, help motivation, engagement, and ultimately, academic improvement, can be said to be validated. Bilingual systems allow us to help students learn language in a more natural way, and in that sense, reading original books in extensive reading programs offers the opportunity of expanding language knowledge in a similar fashion to how native students would. Notwithstanding, steps need to be actively taken in order to consciously move away from traditional teaching methods that might be hindering our teaching practice, and, accordingly, students' performance.

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Flipped Classroom Through CLIL: Evaluating Effectiveness of Flipped Learning in a Bilingual School

Flipped Classroom a través de CLIL: evaluando la efectividad de Flipped Classroom en un colegio bilingüe

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Abstract

Motivation plays an important role in the learning of our students. Nowadays, the use of new technologies leads us, as teachers, to improve our teaching techniques. Therefore, the learning and attitude of our students towards the subject will change so that they feel comfortable and learn in an easier and more active way. The use of innovative methodologies together with the use of new technologies makes the motivation grow and the results are more satisfactory. This article develops the research carried out in a bilingual school in Madrid with a group of students with whom a new methodology is used (Flipped Classroom) and the results after the experimentation are analyzed.

Key words: CLIL, Flipped Learning, motivation, innovation, methodology.

Resumen

La motivación juega un papel importante en el aprendizaje de nuestros alumnos. Hoy en día, el uso de las nuevas tecnologías nos lleva, como docentes, a mejorar nuestras técnicas de enseñanza. Por lo tanto, el aprendizaje y actitud de nuestros estudiantes hacia la materia cambiará para que se sientan cómodos y aprendan de una manera más fácil y activa. El uso de metodologías innovadoras junto con el uso de nuevas tecnologías hace que la motivación crezca y los resultados sean más satisfactorios. Este artículo desarrolla la investigación realizada en un colegio bilingüe de Madrid con un grupo de alumnos con los que se utiliza una nueva metodología (Flipped Classroom) y se analizan los resultados tras la experimentación.

Palabras clave: CLIL, Flipped Learning, motivación, innovación, metodología.

1. INTRODUCTION

Teachers should acknowledge that motivating and capturing students' attention could improve their learning and their results. A demotivated student may not be able to follow the course of the class or show interest in what is being taught. In order for our message to reach all students and to get them involved in this learning process, there must be a motivation in each of them. As Confucius argues, «tell me and I will forget, show me and I may remember; involve me and I will understand,» which suggests that best way to make sure that students are learning something is through their active participation of their own learning. Therefore, we should encourage them to take part in their own learning experience, and make them feel motivated and important in the classroom, to entail a greater participation and effort towards the subject.

On the one hand, the use of innovative methodologies in which student feels motivated and interested in learning and acquiring new knowledge makes their learning more active. Thanks to that, their attitude towards the subject changes and a connection is established; therefore, the learning experience becomes more enriching for them. Over the years, this can become monotonous, and we can lose the enthusiasm and motivation of our students. Though my teaching experience, I can affirm that what works today may no longer be suitable tomorrow. That is why it is necessary to research and adapt to the new times by searching for new methodologies and ways to promote learning and motivation.

The objective of this Action Research Project is to answer the following research questions, Is Flipped Learning effective in a bilingual school? Do students feel motivated using Flipped Classroom? Does Flipped Classroom help to improve student's results? I have come up with three hypotheses. First, this methodology will result very attractive for them and that they will make the most of it. Second, students will also feel more confident and establish their own learning pace, since there are multiple intelligence levels. The latter is very important to be pointed out because, as Robert Fulghum suggested, «we are so different from each other inside our heads as we are different from the outside», since each student has a distinct learning level, using this methodology, will allow the learning process to be more individualized.

What follows is a brief explanation of previous research related to the changes in the education model, then origins, pillars, and characteristics of Flipped Classroom. I will explain the methodology employed in this study and the development of the project. The quantitative and qualitative results of the study I will be analyzed in order to draw conclusions about the effectiveness of Flipped Learning. Finally, I will discuss the implications of this study for future research and effective classroom practices.

2. LITERATURE REVIEW

Society has been adapting to the changes that have occurred throughout history. All in which shaped a society influenced by the economy, politics and culture. According to that, education and school are not immune to these changes and as Tourón Santiago and Díez (2014) pointed out, if learning is mobilized, education must also do so. That is why the teaching-learning methodology using small devices called Mobile Learning is already a reality that is seen in schools.

School life has had to adapt to modern time, to technological progress, to the new globalized society, etc. Therefore, it is the reflection of all the changes we had around us. These continuous changes bring a need for creative thinking and the ability to adapt to the technological advances; we are teaching a digitally fluent generation which poses the unique challenge of reconnecting them to reality.

In a traditional class, the teacher takes the leading role, dictates, presents tasks, shows content, clarifies any doubts, and sends tasks to be done outside the classroom, both individually and in groups. In the same scenario, the student is the one who listens, takes notes and reflects on what was presented in class. From my own experience, all this in the hands of a good teacher is quite effective, and this has been proven over the years. The acquisition of knowledge is the main objective of this teaching-learning process, where the teacher is the one who decides how and what to learn, and is the only one who assesses the students based on whether or not they have acquired the knowledge taught in class (Vice-rectory Academic. Directorate of Educational Research and Innovation, 2002) Piaget states (as cited in Hernández, 2008, p. 27): «Knowledge is built through experi-

ence. Experience leads to the creation of schematics. Schemas are mental models that we store in our minds. These schemes are changing, enlarging and becoming more sophisticated through two complementary processes: assimilation and accommodation».

Given this statement and the traditional educational model, it is necessary to reconstruct the teaching-learning process. This change goes from the model in which the teacher is the center of knowledge and the one who transmits information, to the student who occupies the central place and the whole process revolves around their learning. This orientation is based on two principles: constructivism and experiential learning (Academic Vice-Rector. Directorate of Educational Research and Innovation, 2002).

We are going to focus on these two principles to understand why Flipped Learning is a good option for this methodological change. According to Hamdan et al. (2013) Flipped classroom instruction is simply defined as an instructional strategy in which students learn content before class, allowing them to come to class prepared and ready for mentoring, active, and experiential learning experiences. Constructivism affirms that knowledge is a mental process of the individual resulting from a process of construction of reality that has its origin in the interaction of people with the world. It is a process of its own that occurs day by day as a result of these two factors (Herrera, 2009).

If we talk about the main representatives of constructivism, names such as Piaget (1896-1980), Vygotsky (1896-1934) and Ausubel (1918-2008) appear, which focused on the student's previous experiences, starting with new ones. Mental constructions and consider that the construction is achieved at the moment when (Herrera, 2009, p. 1): «The subject interacts with the subject of knowledge (Piaget), Interacts with others (Vygotsky), it is significant for the subject (Ausubel)». The other principle is experiential learning. We all learn from our own experiences and the reflection of them. This type of learning influences the student in two ways: it improves their cognitive structure and modifies attitudes and behavioral values (Academic Vice-rector. Directorate of Educational Research and Innovation, 2002).

For all these reasons, a conclusion is reached that a change in the educational paradigm is needed to solve this problem. Education in the knowl-

edge society requires various changes in the educational system. Learning no longer consists of absorbing information, but of knowing how to manage information, knowing how to pose the problem if new ways of solving them, that is, learning to make decisions about one's own work. This new definition of learning makes it necessary to redefine teaching that, as indicated by Tourón Altarejos and repairing 1991, the task of teachers in this ever-changing society is based on teaching students how to adapt to it. «The important thing is no longer what is taught but how it is taught» (Tourón, 2014). What is important is not teaching, but learning, transferring the role to the student who must transform information into knowledge (Tourón, 2014). As a consequence of these changes, the teacher and the student will assume new roles. It is necessary for the teacher to change his role as an actor and lecturer for that of a counselor while the student will be the apprentice who through personal involvement will build his own knowledge (Tourón, 2014).

Once understood, that the best way to learn is to perform a change of roles, where the student is the protagonist of his teaching-learning process, and where experimentation makes both the concepts and the content are innately acquired. Then, it is time to include the technological advances that have been produced over time and that have helped us to qualify our students as digital natives. Based on the fact that our students, from an early age, know how to handle different technological devices, it is time to take everything described above and change the methodology in the classroom. The Flipped Classroom is a pedagogical model framed in hybrid learning in which material is provided outside the class to transfer the development of content traditionally considered as tasks within the classroom environment (Rodríguez et al., 2015).

For all this, the use of technology is essential, since a physical and virtual environment is combined so that students can learn through experimentation. In this way, students will learn the theory at home, through presentations, videos, etc., will advance at their own pace since they can visualize it as many times as they think necessary. Once in class, learning will be more individualized since time at school will be dedicated to answering questions, practicing, carrying out activities and creating content. As the roles in this new methodology change, time in class will be dedicated to reinforcing content, carrying out activities in which students

interact and actively participate. In this way, teachers can devote more time to individualized student attention and create a collaborative environment in the classroom.

Flipped Classroom is therefore defined as a comprehensive approach that combines direct instruction with constructivist methods, increasing student engagement and involvement with the course content and improving their conceptual understanding. It is a comprehensive approach that, when applied successfully, will support the phases of a learning cycle (Santiago, n. d., p. 1).

As for its origin, Flipped Classroom emerged in 2006, when two chemistry teachers at Woodland Park School, in Colorado, applied it and were considered pioneers in this methodology. These teachers were Jonathan Bergmann and Aaron Sams who, based on their own experience, published in 2012 their work «Flip your Classroom: reach every student in every class every day». In this book, they explain how the need to change the traditional system ensures, that all students have the opportunity to witness their classes no matter how far away they lived. They realized that students frequently missed some classes for certain reasons (illness, for example), so, in an effort to help these students, they decided to record their classes. In this way, they realized that, by extending it to all students, even if they regularly attended the classroom, they could maintain a more individualized learning focused on the needs of each student.

The Flipped Classroom concept refers to the fact of investing the place and time of development of school assignments: those traditionally done at home are completed in class and proposals in class are developed at home (Bergmann & Sams, 2014). This model tries to make good use of technological infrastructures, multimedia resources and digital technologies to promote learning and school activities organized in such a way that its focus is the daily life and activities of students (Creative Classroom Lab., 2013). In this way, time in class is dedicated to reinforcing content that is offered, not only through a book, but through another format such as Information and Communication Technologies (González & Carrillo, 2016). When the Flipped Classroom is used in our classroom, students will perform a series of simple tasks at home such as viewing videos, reading documents, interactive activities, etc. That allows

them, once they arrive at class, to be able to carry out a series of activities that involve interaction and participation and in which they have the direct and individualized help from the teacher who will help them to solve doubts during the realization of them, so the attention to students is done in a more direct and individualized way.

In order to know the most important characteristics of the Flipped Classroom model, Hamdan et al. (2013) argue 4 fundamental pillars that give its name to its acronym FLIP.

- **Flexible environments:** Educators organize their learning space to accommodate the lesson or unit, creating flexible environments where students choose the time, place, and pace of learning. Educators build their own assessment system by objectively measuring understanding in a meaningful way for both students and teachers.
- **Learning culture:** In this learning model there is a shift from a teacher-centered class to a student-centered class. Students become the center of learning where they actively and significantly participate in the formation of knowledge. Educators help students explore issues in greater depth using student-centered pedagogies aimed at preparing and developing the proximal zone where they are challenged but not so much that they become demoralized (Vygotsky, 1978, cited by Hamdan et al., 2013).
- **Intentional content:** Teachers continually think about how they can use the flipped classroom model to help students achieve better conceptual understanding as well as procedural fluency. Educators use intentional content to maximize time in the classroom as well as adopt various instructional methods such as active learning strategies.
- **Professional educator:** In this model, educators are more important than ever and often more demanding than in the traditional method. Students should determine when and how to change direct group instruction to individual learning space as well as maximize face-to-face time between students and teachers. Teachers are thoughtful, observe and return relevant feedback to their students, interact with each other, accept constructive criticism, and tolerate controlled chaos in the classroom.

Several studies and authors claim this methodology to be beneficial. The following can be highlighted: Bergmann and Sams (2012), point out that when teachers are not standing in front «just talking» to their students and are able to circulate and talk with students, they are likely to understand and respond better to the emotional and learning needs of students. Prieto Martín (2016) states that students arrive better prepared, know their doubts better and present a greater predisposition to participate. In addition, Shapiro (2013) affirms that accessible contents at any time and place (Shapiro, 2013) and Marlow and Bulter (1975) state students take responsibility for their own learning, follow their own rhythms and have access to the material at any time. So that they are not left behind, this results in greater motivation and better behavior. Also, this model alters the nature of the task by having students practice and apply their learning in the classroom, under the watchful eye of the teacher (Bergmann and Sams, 20212; Greenberget al., 2011). On the other hand, some of the drawbacks found are:

- Increase in the digital divide, especially in places where economic resources are scarce.
- Greater investment of time and training by the teacher (Educause, 2012).
- Greater commitment and responsibility on the part of students.

According to Bryan Goodwin and Kirsten Miller (2014), the evidence on the Flipped Classroom model is yet to come. So, more things will be discovered, and others improved. Numerous studies carried out show that classes of different educational levels experience gains in their performance and satisfaction and motivation on the part of students, one of these reports is the one written by Yarbrow et al. (2014).

3. METHOD

For evaluating the effectiveness, motivation and improvement of Flipped Learning, I implemented a system with some remarkable aspects. First, I chose an educational level in which the classes were as homogeneous as possible to carry out the study. One was the reference group and the other the experimental one. The educational level chosen was 6th grade of Primary Education. The intervention will be scheduled for a period of

approximately two months. With this, it is expected that students will be able to think, experiment, reflect and develop their critical thinking through meaningful learning.

Prior to the study, the first step was to conduct a questionnaire to the students of the experimental class. It was a questionnaire that consisted of 20 questions intended to measure the level of satisfaction with the class and to evaluate, not only the teaching methodology that was being used, but also the motivation that the students had towards it. Subsequently, we started working with the flipped classroom methodology. Once the theory was taught and the activities, projects and tests related to the topic were carried out, another questionnaire was conducted. This questionnaire was almost the same as the previous one, but this time the questions were intended to measure again the level of satisfaction with the class and to evaluate both the Flipping teaching methodology and the motivation that the students had towards it. After completing the process, I compared and contrasted the academic results between the reference group and the experimental group according to the results obtained in the knowledge test.

3.1 The Context

The school where I conducted the study is a bilingual public school, located in Alcorcón. This center belongs to the bilingual program of the Community of Madrid since 2006. I have been working for more than 13 years with the CLIL methodological approach. We work without books, the basis for obtaining the class contents are the blogs of each subject where children can access to them. The contents showed, are not only theoretical, but there are also explanatory videos, projects, oral presentations and written activities that make learning more motivating and dynamic.

All students who are exposed to a Content and Language Integrated Learning (CLIL) approach seem to work efficiently. The attitude of the students towards this methodology is very positive since they feel involved in their learning and are comfortable. The educational level chosen was 6th grade of Primary Education; this level is divided into two groups, A and B. They are children between the ages of 11 and 12. The group chosen as the experimental group is a class of 24 students. These students are all used to do teamwork and to use new technologies. The other group was the reference

group. The topic taught to both groups was the Human Respiratory System. The reference group kept working in the usual way and the flipped learning was implemented into the experimental group.

3.2 Design of the study

This study was conducted over 13 sessions where we worked on CLIL and FLIPPED Classroom the same topic in both groups. Both groups are quite similar, they have several levels of English and have a good behavior, which is favorable for a good learning environment, we have been working in the same way. The students accepted the new methodology used. Sessions were held in a way that students were learning the basic theory at home about a given topic, using an educational blog. In order to teach it, I uploaded edited videos on the class blog and some complementary information that could help them to understand it. The children watch the videos at home and later in class, they clear their doubts and carry out activities related to the topic, so they will feel more confident. These class activities were aimed to help students consolidate what they learned at home.

Other sessions were dedicated to carry out different parts of a project related to the different contents of the topic, such as models, power points, crafts, and posters. They also needed to do an oral presentation in front of their classmates in which they showed what they learned during that entire period. At the same time, they showed their classmates the final project that they had to work on. Finally, they took an exam to evaluate included all the concepts and theory learned during that period. Most students do not receive help at home, by this way; the doubts that may come up when they are doing their homework will be cleared right away because the teacher will be with them. On one hand, there is a change in their learning environment, and they must be responsible for watching the videos with the explanations and organize themselves- The teachers also can provide a more individualized assistance to the students. In this way, students feel more secure, participative and motivated. If their motivation increases their learning will be enriched and the teaching-learning process will be more favorable.

3.3 Data collection

The concept of data collection techniques encompasses all the technical means used to record observations or facilitate data processing. Within

these techniques there are some instruments used, such as questionnaires, observation, objective tests and test, among others. It should be noted that an instrument is valid if it measures what it claims to measure, and it is reliable if there is confidence in the data obtained from it (Lacave et al., 2015).

The focus will therefore be both quantitative and qualitative, when using different information collection tools, these being the questionnaire, the observation and the exam:

- *The questionnaire:* it offers quantitative information by collecting numerical data, allowing us to apply it at different times, thus facilitating independence between the primary and secondary scores obtained from the students. The tests or questionnaires are a set of instruments that collect information about the capacities and / or abilities of the subjects. They are continually employed in areas such as Psychology, Sociology, and Education, and are tailored to skill or performance. According to Hopkins (1989), among the advantages of the questionnaire in relation to other information gathering techniques, we find the following:

Ease of performance and assessment, direct comparison between groups and individuals, and the feedback provided on attitudes, adequacy of resources and the teacher, as well as providing help and quantifiable data.

In our case, the evaluation was carried out through a questionnaire made up of 20 items on a Likert scale with five response options (1-5, never always), these referred to different issues such as attention, study habits and aptitude of the students towards the teaching-learning process (table 1) This type of scales determine the degree or frequency with which a characteristic or trait occurs, being the response to the different items, the reflection of the attitudes and behaviors on the part of program participants. This questionnaire will be used for both the initial and the final evaluation, as a pre-questionnaire and postquestionnaire, with the aim of checking whether improvements have been made and the achievement of the objectives set after the intervention has been achieved. The questionnaires were distributed at the beginning of the study. The students of the experimental group filled in the questionnaire responding to the proposed items. Once the questionnaires were completed, the responses were collected and analyzed in order to have a general idea of how the methodology used in the school up to now was

seen from the point of view of the students and the degree of motivation towards it.

Table 1
Questionnaire/pre-questionnaire and post-questionnaire

Questionnaire					
Name:		Surname:			
Date:					
Questions	Never	Sometimes	Often	Usually	Always
I put a lot of interest in what we do in class.					
During class I frequently desire for it not to finish.					
I put a lot of attention in what the professor says.					
I participate in discussions or activities that are done in class.					
I distract myself in class doing scribbles, talking with my friends nor exchanging notes with my classmates.					
I get bored or fall asleep in class.					
I am satisfied with the activities that are done in class.					
I do extra-work by my own will.					
I feel good and comfortable in class.					
I do my tasks with effort and motivation.					
When I get out of school I have desire to keep studying.					
I am satisfied with my learning.					
I consider that the resources used by the teacher in class help to understand the topic.					
I feel desire to reach more about the topic that we are learning in class.					
I feel the class is short and entertaining.					
I learn something new in every class.					
I am interested in learning.					
The teacher is creative presenting the topic.					
I do my homework.					
The teacher's explanations seem attractive for me.					

Finally, once the study was finished, I distributed the same questionnaire again to make a comparison in the results. This was useful to be able to analyze the changes produced after the implement of the new methodology in the experimental group. All this information helped me to come to a final conclusion.

- *The observation:* it is one of the innate acts of human beings for the construction of knowledge of their environment. In turn, it is used as a data collection technique (Buendía, Colás & Hernández, 1997). It is a systematic and controlled process, by which information is collected during an investigation. It is characterized by being qualitative by obtaining categorical or quality data, taking into account that it is used for the subsequent analysis and interpretation of the data obtained to draw up the conclusions and the final report of results.

Likewise, a formative evaluation was carried out throughout the process by observing and recording the attitude of the experimental group students through a diary, this instrument analyzed attitudes, feelings and content acquisition. Daily, I was writing in a small notebook, everything that I could observe in the development of the class; the behavior of the students, the interest they showed, their doubts, questions, etc. Everything that caught my attention and that they did not do with the previous methodology. On the other hand, the assistant was collecting the same information, observed everything that happened in the class and we shared, daily, all our perceptions. In this way, I was able to collect the changes produced in them with this new way of teaching-learning. Through this, feedback on their learning was obtained, and the intervention could be readjusted or modified.

- *The exam:* as the main instrument for measuring the teaching-learning process (Jorba & Sanmartí, 1994), it is another complement the instruments used in this study. The data that you provide us are quantitative and qualitative as it allows us to collect conceptual, procedural and attitudinal content. In turn, they allow reorientation measures to be taken, achieving higher quality learning, as indicated in the Organic Law of Education (LOE¹).

¹ Ley Orgánica de Educación (LOE; Ley Orgánica 2/2006, de 3 de mayo, 2006).

Both groups, the experimental and the reference group, carried out the same exam. The exam was divided into two parts, 10 multiple choice questions and another 5 long questions about what has been learned about the respiratory system. This instrument was carried out at the end of the entire intervention process, in order to measure the work capacity and the results obtained among the students after the intervention. As mentioned above, the two groups were quite similar, it helped me to compare the type of improvement that had occurred through the use of the new methodology.

3.4 Methodology

This study is aimed at improving the performance and global development of students. It arises from the observation of certain shortcomings in the methodology applied so far, and from the need to face current problems. For this, the experimentation and application of a new methodology with one group of students is proposed, while the other will continue working with the CLIL methodological approach. With this, it is intended to measure the response and work capacity of the students, the impact of Flipped Learning and the motivation that arises among the students who learn with this new methodology.

The process that was followed with the experimental group to teach the Respiratory System was as follows: first, the questionnaire (pre-questionnaire) was passed to the students to measure their response, impact and motivation, without having introduced anything related to the new methodology. Later on, the topic was taught applying the new methodology. All explanations, tasks, activities, etc. were carried out through the Flipped Learning methodology. After that, the content exam will be performed by the students. This test contained the same type of questions that are normally asked at the end of any topic taught in class. Finally, the students took the questionnaire again (post questionnaire). In this way, the impact can be measured, and data can be collected to show us whether said intervention has been significant and effective. In turn, with the other group, we continued working with the CLIL methodological approach, following the normal sequence of development of a CLIL topic, and carrying out the same content examination as the experimental group to measure and compare the results.

However, it must be taken into account that the monitoring of the intervention was carried out through observation and this was part of the entire

process, making the corresponding anecdotal record through the diary. In this way, the method and planning of the intervention could be adjusted or modified, depending on the information collected in the responses and perceptions. The person who carried out the initial and final evaluations of each student were the English teacher, who taught them the theoretical and practical subjects that were the object of the intervention program, and the assistant, who helped them in the observation and exchange of impressions. On the other hand, continuous evaluation was carried out after each session by both, recording and analyzing what was observed in the intervention. The final evaluation was carried out at the end of the intervention and was proceed to its subsequent study and analysis of the results. This made it possible to analyze the relevant positive and negative aspects of the study, to modify and develop the necessary improvement proposals, and thereby increased its effectiveness before its successive implementations.

4. DATA ANALYSIS

The results obtained in the intervention are presented below, with the aim of examining the degree of efficacy of the same. First, the results of the pre and post questionnaire will be analyzed, then the conclusions drawn from the observation through the diary entries and finally, the results obtained in the examination of both groups, which are quite homogeneous as I have said before, will allow me know if the new methodology has had a positive influence.

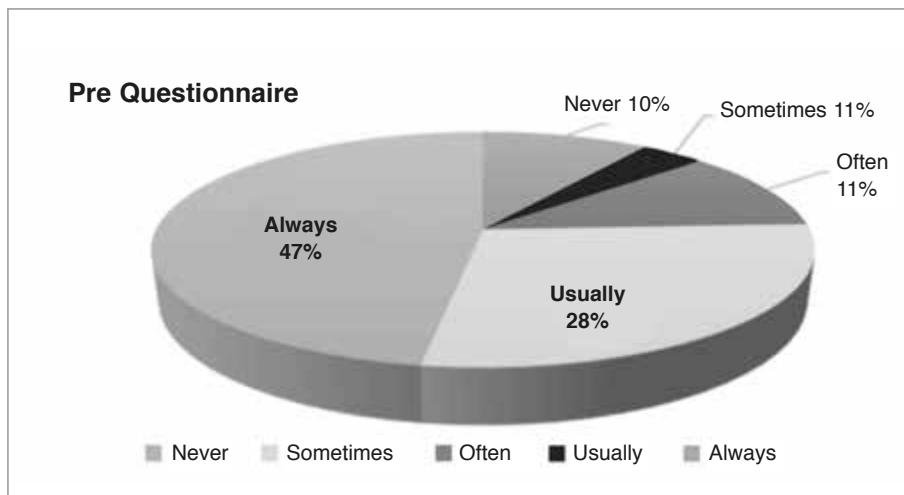
According to what was obtained in the initial phase through the pre-questionnaire phase, and then those related to the final phase through the post-questionnaire phase and globally after the intervention, for comparison. In this way, the impact of the study carried out can be assessed and analyzed, taking into account the evolution of the responses obtained through the evaluation instrument used, and the degree of achievement reflected in the qualitative responses.

The size of the sample corresponds to the experimental group, 24 students from the 6th A grade class of CEIP Daniel Martín, who will participate in the study and will be the object of intervention. As I mentioned previously, the questionnaire consists of 20 items on a Linkert scale, where students answer from 1 to 5 to them, where 1 is never, 2 is someti-

mes, 3 is often, 4 is usually and 5 is always. If we analyze in general terms the responses obtained from both, pre and post questionnaire, we can observe the following information:

Beginning with the pre-questionnaire, the one I give to my students at the beginning of the study, the following data was taken from the students' answers:

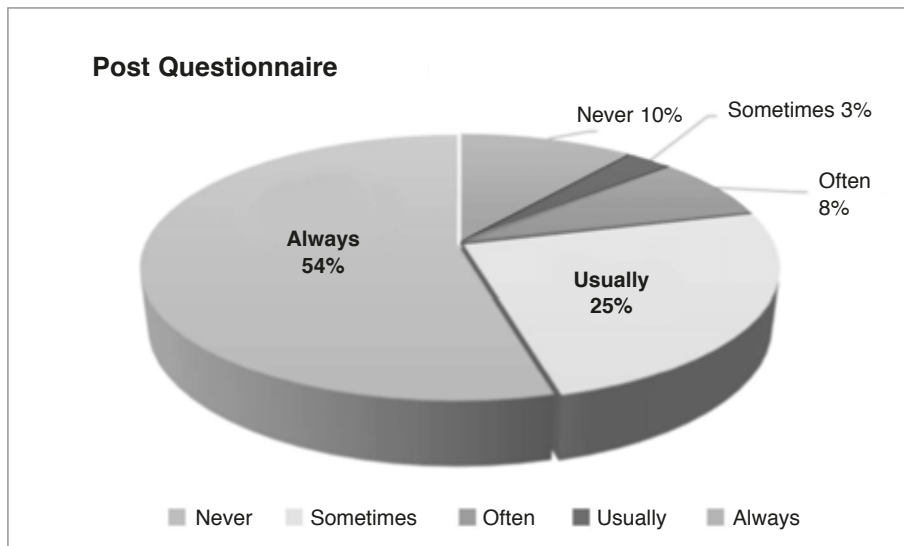
Figure 1
Prequestionnaire Total Percentages



Based on the responses to the items answered by the students, 47% choose the answer option «always» where students recognize that they are satisfied with the activities that are done in class and they do them with effort and motivation. Among other statements, 28% do so «usually» referring to what they see the desire to keep studying when they get home and that they put a lot of attention in what the teacher says among other items. It should be noted that 10% of the students show that «never» is among their selected option to reflect their responses related to items in which they remain directed and uninterested in class. Such scribbling or doodling, talking with friends, falling asleep in class, nor exchanging notes with classmates. These results gave us enough information to determine the degree of involvement and evaluation in terms of the teaching-learning process.

The Post-questionnaire was then given to the students after using the new methodology. The percentages are slightly modified from those collected in the previous one.

Figure 2
Total Percentages Post Questionnaire

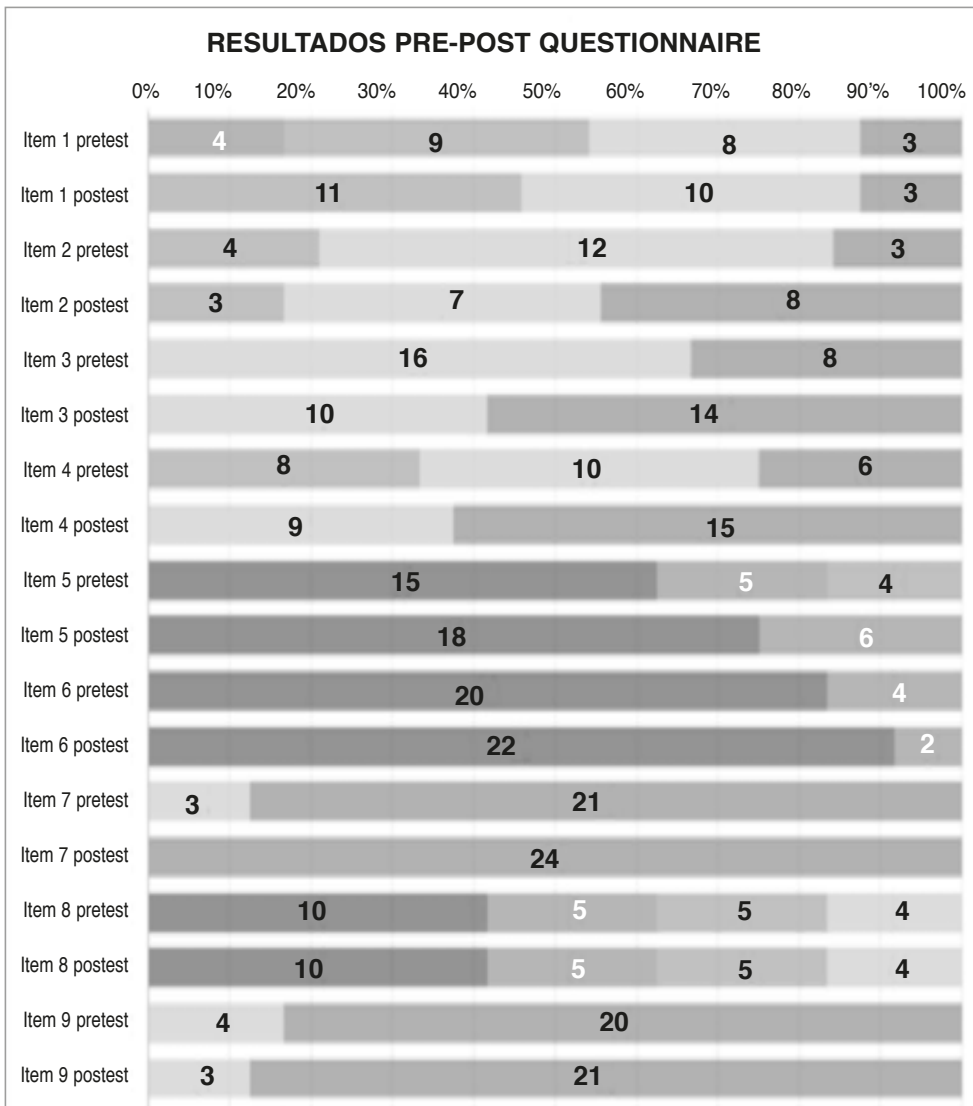


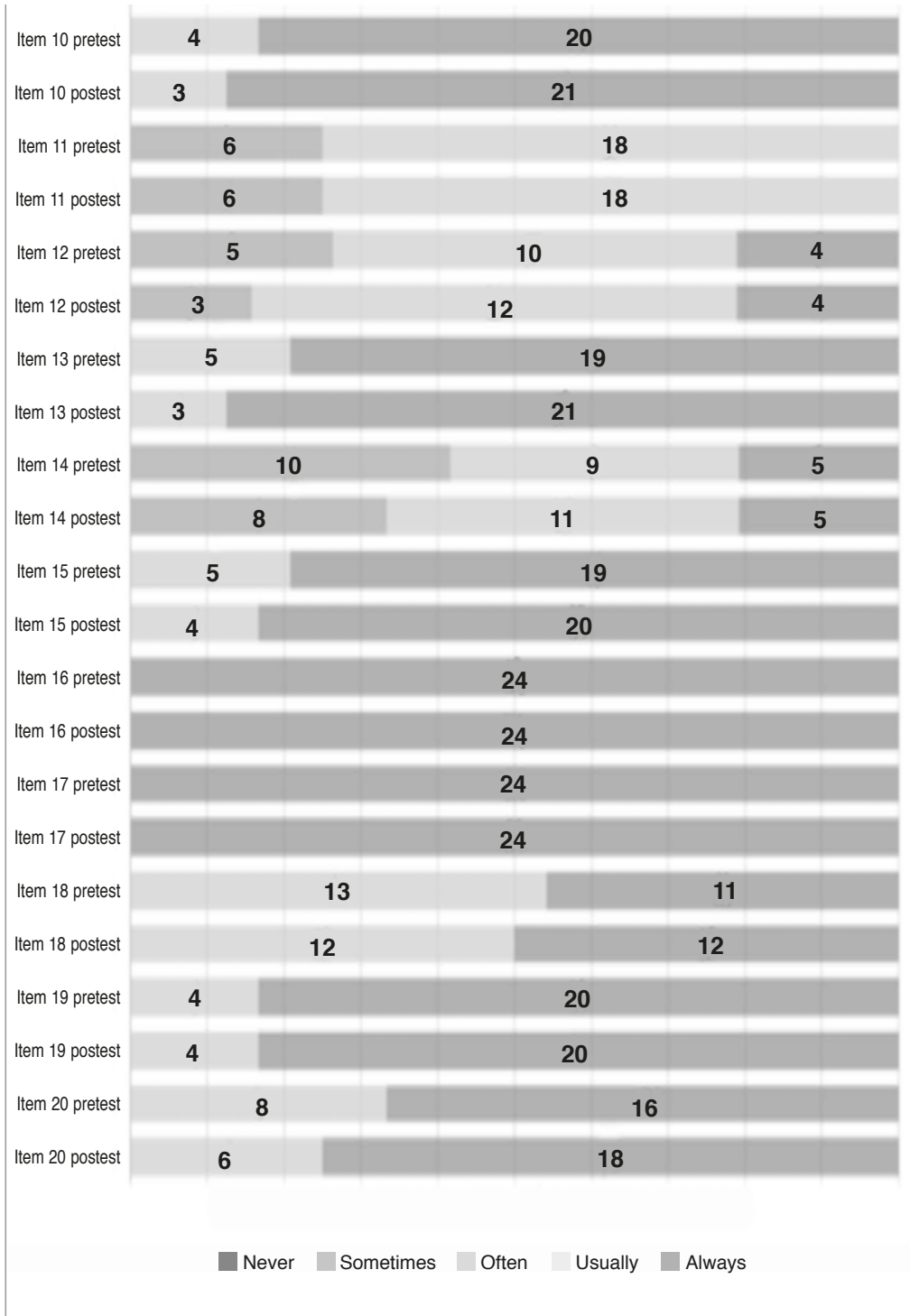
In this case, the «always» range has obtained greater responses than in the initial phase, standing at a percentage of 54% of the total number of students, in which the «usually» option's percentage was lower. Some of the responses such as I am interested in learning, I put a lot of attention in what the professor says or I feel the class is short and entertaining; have been rated very positively, becoming «always». The other ranges «never and sometimes» show almost no significant differences and «often» is reduced by 3 points compared to the initial phase. In some items, you can see the decrease in the degree of distraction and boredom in the class.

If the responses in relation to each item are taken into account, the changes in each of them can be verified before and after the intervention, thus reflecting more positive scores regarding the initial phase. In the following graphic, we can observe a comparison between the answers obtained in each item in the pre and post questionnaire, where the numbers represent the students who answered to that item in the frequency chosen. In this way, we can see how many students have changed their minds once they have experienced the new methodology. The aim of this questionnaire was to measure the degree of interest and motivation of the students in the class through items related to participation, such as I participate in discus-

sions or activities that are done in class (4), I get bored or fall asleep in class(6); their interest in the subject, such us I put a lot of attention in what the professor says (3), I do extra-work by my own will (8); or their attitude towards the contents, activities, methodology, such as I feel good and comfortable in class (9), I feel the class is short and entertaining (15).

Figure 3
Results of the number of responses obtained in both phases of the Pre-Post Questionnaire





As can be seen in the post-questionnaire phase, the items corresponding to questions 2 (during class I frequently desire for it not to finish), 3 (I put a lot of attention in what the professor says), 4 (I participate in discussions or activities that are done in class), 7 (I am satisfied with the activities that are done in class), 13 (I consider that the resources used by the teacher in class help to understand the topic) and 20 (the teacher's explanations seem attractive for me), have been marked by more than one student in relation to the initial pre-test phase. These questions encompass the student's interest and motivation in the teaching learning process, which have been improved through the intervention carried out.

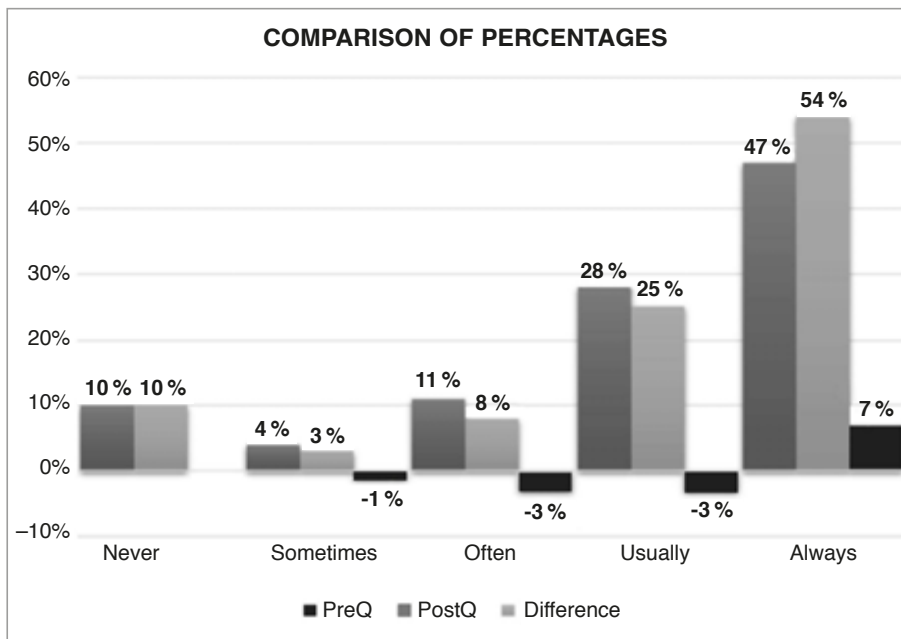
Items 5 (I distract myself in class doing scribbles, talking with my friends nor exchanging notes with my classmates) and 6 (I get bored or fall asleep in class), identified with distraction and boredom, do not reflect positive improvements despite the intervention.

Highlight items 8 (I do extra-work by my own will) 9(I feel good and comfortable in class), 10 (I do my tasks with effort and motivation), 11 (When I get out of school I have desire to keep studying), 16 and 17 with almost or no variation despite having intervened with a different methodology, highlighting items 16 (I learn something new in every class) and 17 (The teacher is creative presenting the topic) in which all students reflect that they always learn something new and their interest for learning.

4.1 The findings

In order to make a global assessment, comparing both pre-questionnaire and post-questionnaire, the following general data is presented, which show existing differences once the intervention has been performed.

Figure 4
Comparison of Percentages Before-After the Intervention



Taking into account the results with respect to the percentages obtained both in the initial phase and those collected in the post-questionnaire phase, it can be determined that the «never» range does not reflect any change despite having intervened, standing both before and after, 10% of the option chosen by some students, when the desirable thing is that it had decreased. On the contrary, both the «sometimes» option, as well as the «often» and «usually» option have been slightly diminished among the participants' choice options, being less chosen than in the previous phase.

Finally, the «always» range has risen in the choice among students, significantly improving and increasing by 7 % among the response options of the students after the intervention, which confirms that, to a certain extent, the intervention has been effective. Based on these findings, it's clear that the change to the new methodology hasn't caused a great influence in students.

In the questionnaires, an increase in attention and participation was observed, as well as an arousing interest in what was being done in class. For the rest, there were no notable differences. I believe that this was due to the methodology we use at school. By working with CLIL, the way children

learn and work in class does not correspond to the traditional way. At school, we do not have textbooks, thus children use new technologies to support classes and acquire knowledge. The use of blogs is a great help, since through videos and web pages they can consult and expand their knowledge. In this way, they have everything they can find in a textbook, but in a more striking and attractive way. According to the second instrument used, it is important to note that through the observation made during these days, we were able to affirm that our students are accustomed to work in a team, investigate and make oral presentations presenting projects, they are used to changing roles, in which they become the main character of the class. By adopting Flipped Learning, there was not a great variation of results. An increase in participation and assimilation of knowledge can be noted. Everything new is attractive and interesting, which made their attention improve during the first days, and they feel unsure of the process and expectant. Little by Little, they were accepting the new methodology and awakening their interest in learning. An increase in the participation and in the knowledge has been observed.

Children feel more confident in the process of checking what they have learned or been taught, since they can solve doubts in class and are exposed to a more individualized learning. When feeling confident about themselves, their attitude towards the subject changes. Regarding the last instrument used, the students take an exam to verify the acquisition of the contents taught in all the sessions. In the results of the exam there are no great differences between the two groups of students, this means that there are similarities between the way of working in both methodologies. All this is reflected in this type of test since no type of result that can attract attention is observed.

To sum up, I can affirm that there are no striking differences between the results obtained before the intervention and the results obtained at the end of this study. There are many similarities between the way they study and work on the subject. In a regular school, in which classes are taught in a traditional way, the research could probably have more different and significant results. In CEIP Daniel Martín, the study did not reveal major results due to the use of the CLIL methodology and the common usage of new technologies to teach the classes.

5. CONCLUSIONS

5.1 Outcomes

This study aimed to analyze the effectiveness of Flipped Learning in a bilingual school. To respond to this objective, in the first place an analysis of the Flipped classroom model has been carried out, explaining what it is, how it arises, how it is applied and the way in which it influences the teaching-learning process in students. Since the change of scenario in which each of the tasks were carried out was different, I expected to find a statistically significant difference in the use of the new methodology. The results have shown that this has not been the case: there is a minimum percentage of students who feel more motivated and happier with the new methodology, but it is an exception. Most of them continue with the same attitude and the same feelings towards the way of learning. My own interpretation of what happened is that the students are used to those active classes in which they participate and learn in a non-traditional way. I think that is why this new methodology has not resulted too different from what they were used to. As a result, the level of motivation has not increased, and their line of learning has remained continuous. It should be pointed out that some students commented that learning at home with videos was an amazing resource. Some even liked to share these videos with their families, therefore showing an increase to learn more outside the classroom. On the other hand, one student stated that she did not see much difference between the two methodologies, that she liked and felt comfortable with both.

It is clear that the we, as teachers, must teach our students in a way that they feel motivated and engaged with the methodology. The implement of this new methodology has not significantly changed their perception since the motivation and confidence they had before starting with this new methodology was already high. Perhaps, if we analyze the results of some of the students with lower academic level, it can be observed that there has been a slight change in their perception towards learning the foreign language and in their confidence.

5.2 Implications

The goal of this study was to find out if Flipped Learning is effective in a bilingual school, if students feel motivated by using Flipped Classroom and

if it helps them improve academic results. Through the use of this new methodology, it was intended to increase the students' motivation and their attitude towards the subject in order to improve their learning and the assimilation of their knowledge.

First of all, the methodology of the class varied, but did not influence the students in the expected way. The students continued to participate actively and, although they had a positive reinforcement, the results were not as expected. There was not much difference between the current opinion, and the opinion that they had previously. Second, through the analysis of the surveys and conversations that the language assistant and I had, we came to the conclusion that the results corresponded to the attitude of the children in the class. The children felt more confident because they could experience a more individualized learning, but their attitude towards the subject did not change much with respect to the attitude they had with the other methodology.

This study is limited to a specific situation, in a specific school and in a specific class. As mentioned above, the results were not as expected, and everything was due to the current methodology that is carried out in the school. From my point of view, the study would have been more revealing if it had been conducted in a different school with the same type of students, in which they learn in a traditional way, that is, with a textbook and using few technological resources to complement their learning experience. After preparing this study, another future line of research has emerged in which the implementation of the Flipped Classroom model is carried out in a bilingual school where the methodology used does not resemble the new methodology to be implemented.

In conclusion, motivation is very important for children to learn, thus the teacher has to find the best way to engage and spark the interest in their learning. There are always new things to try, new methodologies to carry out and intriguing resources to catch their attention. We must never stop learning on how to adapt our teaching methods to engage students to their full potential.

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Learning Centers Based on Multiple Intelligences: Enhancing English Language Learning in Primary Bilingual Education

Centros de aprendizaje basados en inteligencias múltiples: Una herramienta de mejora del aprendizaje de la lengua extranjera en contextos educativos bilingües

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MAESTRA DE LENGUA EXTRANJERA Y EDUCACIÓN MUSICAL

Abstract

A new school year starts and once again teachers are caught up in a never-ending wheel of contents, objectives, external evaluations... which can make the teaching practice overwhelming, diverting attention from what really matters, our students. Having all this on the table, teachers might feel as they are not able to reach their learners demands and individual needs in terms of learning, while developing the elements of the foreign language curriculum. Besides, there is a widespread feeling of being innovatively competent within the teaching community. The current study was born in light of all this, conducted in Spain with second grade bilingual elementary students; it combines Gardner's theory of Multiple Intelligences with an active methodology based on learning stations. By dedicating spaces in the classroom where students can perform activities related to the different intelligences, individual and group dynamics are developed throughout a common project. This study shows significant student gains not only in language acquisition, but also across a diverse range of skills, specifically in regards to interpersonal and working memory skills. Although at a small scale and with limited student sample, it provides an inspiring and powerful outlook to multiple-intelligence centers based methodology leading to increased student achievement.

Key words: learning centers, multiple intelligences, English language learning, cooperative learning.

Resumen

Comienza un nuevo curso escolar y una vez más los profesores nos vemos envueltos en una rueda interminable de contenidos, objetivos, evaluaciones externas... que pueden hacer abrumadora la práctica docente desviando la atención de lo realmente importante, nuestros alumnos. Con todo esto sobre la mesa, satisfacer las demandas y necesidades individuales educativas de los alumnos, mientras desarrollan los elementos del currículo de lengua extranjera puede parecer una tarea casi imposible. Además existe un sentimiento generalizado de ser innovadoramente competente dentro de la comunidad docente. A la luz de todo ello nació el presente estudio, realizado en España con alumnos bilingües de segundo de primaria. El estudio combina la teoría de las Inteligencias Múltiples de Gardner con una metodología activa basada en estaciones de aprendizaje. El desarrollo de dinámicas tanto individuales como grupales en el aula es posible dedicando espacios en el aula donde los alumnos pueden realizar actividades relacionadas con las diferentes inteligencias a lo largo de un proyecto común. Este estudio muestra avances significativos no solo en la adquisición de la lengua inglesa, sino también en una amplia gama de habilidades, específicamente en lo que respecta a las habilidades interpersonales y de memoria de trabajo. Aunque a pequeña escala y con una muestra limitada, proporciona una perspectiva inspiradora y poderosa para la metodología basada en centros de inteligencia múltiple que conduce a un mayor rendimiento de los estudiantes.

Palabras clave: centros de aprendizaje, inteligencias múltiples, aprendizaje de la lengua inglesa, aprendizaje cooperativo.

1. INTRODUCTION

In a world conformed by a wide range of countries and cultures the necessity of communication amongst people is a reality that cannot be denied. Due to an increasingly complex society and a rapidly changing technology-based economy, schools are being asked to teach diverse students to higher academic standards than ever before (Rose & Mayer, 2002; Gregory & Chapman, 2006). Under this perspective, the knowledge of a second language, more precisely English, seems to be essential for students. That is the reason why nowadays, knowing a foreign language has become a necessity for both social and educative reasons. Concerning our country, bilingual education faces enormous challenges. According to a survey carried out by *Cambridge Monitor* (Cambridge University Press, 2017), 44% of Spaniards consider their English proficiency as being low or very low. This rate places Spain as one of the countries with the lowest level of English within the European Union.

Being aware of the importance of second language learning, the regional ministry of Madrid initiated a bilingual school program in 2004 (Orden 5958/2010 de 7 de diciembre de 2011). Among other things, the project aimed to use English as a means of communication in content areas such as science, arts, physical education or music. This new bilingual movement forced teachers to move outside of their comfort zone and explore new methodologies and approaches for foreign language teaching/learning (Pena et al., 2005). As a result, not only students but also teachers have modified and adapted their lessons to the new educational context (Halbach et al., 2009).

Although English proficiency seems to be the centerfold of this issue, we shall not leave pedagogy aside. In other words, it is not only teaching English, but how we actually teach that foreign language. In this sense, pedagogy plays an essential role within the educative experience. It is teachers' responsibility to create instructional practices which make the acquisition of knowledge and skills more efficient, effective and appealing for students (Ausubel, 1963). Moreover, we should bear in mind that students come to school with different backgrounds and a whole diversity of learning styles (Tomlinson, 2004). As effective teachers we should use a range of teaching strategies because there is no single, universal approach

that suits all situations. As O'Malley and Chamot (1990) suggest, some teaching strategies are better suited to teaching certain skills and subjects than others; whereas some strategies are better suited to certain student backgrounds, learning styles and abilities.

This way, the current research will focus on how a mixed methodology based on the combination of learning centers, multiple intelligences and cooperative learning can enhance language learning in terms of grammar and vocabulary. According to the articles that deal with this issue, a pedagogy based on learning centers (Laguía & Vidal, 2006) provides students with exciting and interesting experiences to practice, enrich, reteach, and enhance their learning (Mayer, 2002). These types of centers are filled with manipulatives, art materials, books, and other instructional tools. Students visit the centers to complete an assignment or learn through a variety of activities (Gardner, 1983). Working both independently and in small groups through cooperative learning (Johnson & Johnson, 1994), students are provided with time and space to complete a project which eventually will facilitate them to better acquire both vocabulary and grammar structures.

All this leads to the following hypothesis: A methodology based on learning centers throughout multiple intelligences will enhance language learning, since it offers students multiple ways of developing skills related to language acquisition. In order to establish a starting point, the first objective will be to know students' previous knowledge in order to do so a questionnaire will be passed. The second objective is for students to be able to develop a project by working cooperatively in the different learning centers (each of them dedicated to a specific intelligence). This leads to the third objective, to collect data that will enable us to define to what extent the methodology proposed has been able to enhance language learning. For this, the groups will present their projects and they will fill up a rubric to assess methodology. Finally, the last objective will be to compare and contrast all data collected in order to draw conclusions. For this, the same questionnaire used at the beginning of the project will be passed.

In what follows I will analyze the theoretical background that supports the current study. Then, the methodology as well as the analysis of all data collected will be put forward. This article will end with an overall

conclusion defining the expand of the study and suggesting a plan of action in light of the results obtained.

2. MULTIPLE INTELLIGENCES, LEARNING CENTERS AND COOPERATIVE LEARNING

Diversity is an umbrella term that can have different meanings depending to each individual, and how a person defines diversity will affect the way it is approached (Chung & Miller, 2011). In other words, how a teacher enacts diversity in the classroom may depend on how that teacher understands and conceptualizes diversity. Individual differences when learning are a condition of human beings (Piaget, 1964). As Banks et al. (2005) argue, traditionally school has tackled some of these differences, mainly those related to learning processes. But less attention has been paid to learning styles, diversity in the class and the links established among these three factors. Hence, an ongoing challenge for schools is how to meet the educational needs of every student. In this sense, attention should be drawn to the dissimilarities in personal development as well as students' preferences when learning (Levy, 2008).

Talking about learning styles and preferences, we should now draw attention to the theory of multiple intelligences (Gardner, 1983). Gardner's work has influenced the way many teachers approach their classroom instruction. There are many ways to demonstrate understanding and it is important to incorporate these intelligences when planning to ensure inclusion for all students, and for students to receive the best possible learning experience (Borek, 2003). With an understanding of Gardner's theory of multiple intelligences, teachers can promote new possibilities for learning, with greater emphasis on lifelong learning, which support the development of students' skills in creativity and innovation (Hoerr, 2004).

Rather than seeing intelligence as dominated by a single, Howard Gardner differentiated it into specific 'modalities'. Eight abilities were chosen that he held to meet these criteria: musical–rhythmic, logical–mathematical, bodily–kinesthetic, interpersonal, intrapersonal, and naturalistic. According to Gardner's view intelligences such as spatial, musical, kinesthetic, interpersonal and intrapersonal have generally been overlooked in

education. However, if we can develop ways to teach and learn by engaging all eight intelligences, we will increase the possibilities for students to be engaged and make the most of the learning experience.

Bearing this in mind, an effective way to foster diversity in the classroom would be by offering students opportunities in which they can have access to activities that comprise all intelligences. A suitable way of doing so is by developing learning stations in our classroom. According to the definition given by Kuntz (2014), a learning center is a space in the classroom that allows easy access to a variety of learning materials in an interesting and productive manner. Learning centers are usually designed to offer a variety of materials, designs, and media through which students can work by themselves or with others to operationalize the information learned in the classroom (Shaver et. al, 1968; Laguía & Vidal, 2006).

Although this could sound groundbreaking, there is a long tradition in the use of learning centers in education. Pestalozzi (1827), known as the father of modern education, believed that rather than dealing with words, children should learn by experimenting and they should be free to pursue their own interests and draw their own conclusions. Years later, Decroly (1921) introduced the idea of centers of interest in the classroom; its basic feature was the workshop-classroom, in which children freely went about their own occupations. Behind the complex of individual activities was a carefully organized scheme of work based on an analysis of the fundamental needs of the child (Sofroniou, 2016).

Along the same line, Dewey (1938) criticized the traditional methods since they were «beyond the experience the young learner possess», and underlined the importance of new approaches based on learning by doing. Under the influence of Dewey, Kilpatrick (1918) advocated for a project methodology in the classroom. For Kilpatrick, project method's greatest strength was the potential for building moral character, with students acting in pursuit of a rich variety of purposes, individually or collectively, under the supervision of a skilled teacher to help guide students to make increasingly finer discriminations of right and proper ideas and judgments. Ideally, the democratic teacher will gradually remove him/herself from the educative process (Kilpatrick, 1918). Moreover, after analyzing the psychological and social needs of the French children during the 50's, Celestin Freinet

(1956) developed a methodology based on eight different workshops. Such methodology was adapted to both children's needs as well as their developmental stage. Freinet determined eight specialized workshops: four of which he called basic manual work and four more of evolved, socialized and intellectualized activity.

All in all, learning centers constitute a form of organization in delimited and concrete spaces in the classroom that allow students the development of basic habits of work. It is a creative and flexible model in which children learn through observation, exploration, manipulation, experimentation, creation and social interaction (Mayer, 1992). This methodology facilitates the establishment and enforcement of norms and the development of children's own autonomy, while responding to the differences, interests and learning paces of each child. Nevertheless, if we take a closer look to the work carried out by the authors mentioned above, we can appreciate they also make strong references to teamwork and cooperation (Bain, 2006; Fraile, 2008). In the light of this, a mixed methodology that combines the use of centers of interest with cooperative learning seems to be a perfect match for foreign language learning.

Cooperative learning is defined by Slavin (1983) as a teaching strategy that encourages students to work in «small, heterogeneous learning groups» (p. 431) in order to promote individual learning. The fact that learning groups should be mixed or diverse is significant to ensure that learners can learn from each other and provide encouragement and support to each other in different aspects and at different levels of the curriculum. In the words of the Johnson & Brothers (1994), cooperative learning is a carefully designed system of interactions that organizes and induces reciprocal influence among team members. The accepted idea proposed in these different definitions is that cooperative learning should be taken as an approach in which students help each other in the scope of a common goal while actively participating in the teaching-learning process.

In general terms, the cooperative classroom is formed on the postulates of at least, the following theories: Piaget's genetic epistemology (1970), Vygotsky's sociocultural theory (1978), Ausubel's principles on meaningful learning (1963), Roger's humanistic approach to learning (1995) and the philosophy of positive interdependence by the Johnson & Brothers

(1969). Although Piaget (1970) did not explicitly relate his theory to education, he introduced the idea of children constructing their own learning by doing and actively exploring. From a Vygotskian perspective, students can benefit from more skillful peers within the zone of proximal development, this is «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, p. 86). Because cooperative learning involves active and engaged learning, it inspires students to obtain a deeper knowledge. Students are more likely to retain the knowledge gained through this approach far more readily than through traditional textbook-centered learning (Ausubel, 1983). According to Johnson and Johnson (1969), carefully structured cooperative learning involves people working in teams to accomplish a common goal, under conditions that involve both positive interdependence and individual and group accountability (Johnson & Johnson, 1974). In addition, students develop confidence and self-direction as they move through both team-based and independent work. Although other approaches can rely only on the bottom layers of the pyramid (Blooms taxonomy, 1956), cooperative learning explores the ones on top: applying, analyzing, evaluating and creating.

Among the advantages cooperative learning has in foreign language learning, McGoarty (1989) identifies linguistic, curricular, and social benefits. To his view, cooperative learning increases frequency and variety of second language practice through different types of interaction. It also offers possibilities for development or use of the first language in ways that support cognitive development and increased second language skills. Besides that, it also enables opportunities for students to act as resources for each other and, thus, assume a more active role in learning. In addition to this study, Holt et al. (1991) recognize the possible benefits of cooperative learning in linguistically and culturally diverse classrooms. They suggest that English Language Learners (ELL) need «the maximum amount of time possible for comprehending and using the English language in a low-risk environment in order to approach the language proficiency of their peers» (p. 4). Likewise, cooperative learning has generally avowed to be the best option for all students since it emphasizes

active interaction between students of diverse abilities and backgrounds (Nelson et al., 1993; Tsai, 1998; Wei, 1997; Yu, 1995).

Bearing all these theories in mind, I have chosen to implement a mixed method for foreign language learning in the classroom. Therefore, the current study will be based on the idea of arranging centers of interest related to each of the eight intelligences proposed by Gardner. This way, students will rotate along the centers to perform different activities, all related to the same topic. Moreover, cooperative learning will be a key factor. In order to carry out the proposed task, students will have to work cooperatively to accomplish a common goal.

3. METHODOLOGY

3.1 Context

The current study has been developed with students aged 7 – 8 in a charter school included within the CAM's bilingual project. Focusing on the groups, they all have some common features when it comes to English. They have been learning English since they were three years old so they have a good command of English considering their age and context. In terms of defining their performance and skills, the most remarkable one is listening. As they have had a great deal of contact with the language, they are able to understand, interpret and infer most of the language they hear. Regarding speaking, their production in the foreign language is still quite limited; nevertheless, they can build up chunks of language if they are provided with the right input. Concerning writing, the structures they are able to produce are very limited as well. Although it is still hard for most of them to differentiate between the correspondence sound – letter, they tend to memorize the words in order to get the right spelling. However, they still have the habit of spelling the words the way they sound out in Spanish. The same happens in relation to reading; while they are able to read the words that are familiar to them properly, they have not internalized patterns and pronunciation rules yet. In broad terms, these would be the common features in the four groups. Of course, each of them has its unique and differential characteristics. Of the four

second grade groups, B and D have been selected to be experimental groups while A and C remained as control groups.

The main reasons that led me to choose which would be the experimental and the control groups were mainly their motivation towards the language and their learning preferences. Since groups B and D seem to be less motivated, I believed this methodology would encourage them to show a more positive attitude towards the language. Moreover, these students are slightly more creative and active than the ones in the other groups.

The school's identity hallmark is based on cooperative learning principles, so students are used to the methodology, techniques and grouping required.

3.2 Work plan

Students will work towards a group project related to places in the city. At the end of the project, they not only will have created their own model of a city by using recycled materials, but also will have to present their projects. Therefore, the work in each center will be a unique piece that forms the whole puzzle. Hence the methodology developed is based on three main steps: structuring learning stations, relating each of them to a different intelligence and finally, using cooperative techniques to accomplish the goals established in the centers. As a result, the classroom will be divided into different spaces.

- **Visual-spatial intelligence center:** Here, students create a blueprint of their cities. They will first discuss the buildings they want to include as well as their location. Once they have this clear, they individually create a draft. Having all drafts finished, they use a technique named cooperative drawing which consists of choosing and putting together the parts of the drawing they like best to create a blueprint that has something of each draft.
- **Naturalistic intelligence center:** Since the aim of this center is for students to collect things from nature so they can create natural spaces in the city it will be developed in two different spaces; these are the classroom and the playground. By using 1-2-4 technique an agreement on which items will be gathered and why will be set. After that, the group goes to the playground to collect whatever material they agreed on.

- **Verbal-linguistic intelligence center:** Students are asked to create a short description of their cities by working thorough cooperative writing partners. Hence, each pair agrees on what parts of the city they want to describe, after that they create a short description. Once both descriptions are on the table, they put them together to make the final work.
- **Musical intelligence center:** Students are asked to choose between two and four shops from their cities and create a simple song according to a given structure. Besides, they have access to the music room in case they want to use different instruments to help them create the melody. To do this, they will use a cooperative strategy called «thinking teams».
- **Logic-mathematical and body-kinesthetic intelligence centers:** Regarding the logic – mathematical ability, students make a list of materials they need to create their cities. In such list, they are asked to specify the number and the measurement/quantity needed. This is done by using the «placemat consensus» technique (Kagan, 1995) where students create a list of materials individually to finally compare and contrast their answers to make a common list. After this, by working fine motor skills students will be developing the body – kinesthetic intelligence since they have to physically use those items on their lists to transform the recycled materials into buildings/shops and goods that can be bought in them.
- **Emotional intelligence center:** Being group work one of the main pillars of this project, interpersonal intelligence is worked all through it. By working in small groups, students have to share diverse perspectives, pool knowledge and skills, establish a shared identity with group members and develop their own voice and perspective in relation to peers. Group work is evaluated among team members by filling out a rubric at the end of the project. Likewise, they will reflect on intrapersonal intelligence by individually completing a different rubric that comprises their strengths, weaknesses individual contributions to the group.

3.3 Data collection

The current research has been developed by using both quantitative and qualitative instruments for data collection. Sources such as test, rubrics,

interviews and direct observation have been of paramount importance in this mixed method. Firstly, a test that was designed to be passed to students at the beginning of the study (identifying children's previous knowledge), and at the end of it (comparing the differences between the control and experimental groups). Such test contained an open question on vocabulary and a multiple-choice one about the grammatical structure «there is/there are» (affirmative, negative and interrogative form). Secondly, rubrics were used as part of qualitative research for the project. These rubrics focused on gather information on vocabulary, grammar acquisition, the dynamics carried out during the project and the work developed in the learning centers. Finally, systematic interviews focused on grammar and vocabulary acquisition were carried out to allowed children to use the knowledge gained through the project. Moreover, questions regarding their difficulties and strengths in the different stages of the project were also asked.

4. ANALYSIS

4.1 Data analysis

In order to analyze all data, information was divided into two categories: questionnaires (only measured vocabulary and grammar) and rubrics (also evaluated aspects related to motivation and participation). Nevertheless, all data received was transferred and analyzed on a scale of 1 to 5, 1 being the lowest possible punctuation and 5 being the highest. As mentioned above, the questionnaires consisted of two different questions. This first question being very open («write as many words as you can remember»), the best option seemed to be recounting the number of words each student noted down in order to calculate an average of words per student. Having this done would allow me to create and include them within a set of parameters (1 – 6 words.; 7 – 12 words.; 13 – 18 words.; 19 – 24 words.; 25 – 30 words) that eventually would match the 1 to 5 scale previously mentioned. In spite of the fact that the two questions were not very similar, the same method was also used to analyze the multiple-choice question.

Regarding rubrics, the information gathered was analyzed on a question by question basis looking for similarities and differences among students' responses within the control and the experimental groups. Likewise, the infor-

mation contained was reduced to a 1 to 5 scale in order to facilitate data comparisons and contrast for drawing significant conclusions. Although rubrics were also used to measure grammar and vocabulary, they were used as an attempt to analyze motivation and participation as well. Thus, this last part became more relevant within the analysis.

Moreover, at the end of the project students were encouraged to write down on a piece of paper which of the centers had been their favorite and least favorite. This information was thought to be compared with the rubrics results in order to draw more reliable conclusions. Along with this, the information recorded during the interviews with the groups, as well as the notes taken during the observation of the project were taken into account to cross-reference the results obtained from test and rubrics.

4.2 Findings

After analyzing all the information gathered, results show some promising outcomes. In terms of vocabulary and grammar, we can appreciate from table 1 that, at the beginning of the project, both rates were very similar. This fact was quite significant, since starting from the same point would allow the final results to be much more revealing. Motivation and participation were only measured at the end of the project; hence, table 1 does not show any evidence in relation to those features. The main aim of passing this questionnaire was to have a starting point in order to measure students' progress by learning through different methodologies; therefore, the results obtained by passing the first questionnaire show students' previous knowledge in terms of grammar and vocabulary on a scale of 1 to 5.

Table 1

Beginning of the project analysis comparing average value answers from experimental and control groups on a scale of 1 to 5

	Control Group Average Scores	Experimental Group Average Scores
Grammar structures	2.03	2.12
Vocabulary	1.97	1.98

At the end of the project, questionnaires and rubrics show some revealing information that needs to be highlighted. In terms of grammar structures, the control group shows a higher average score than the experimental group. This could be due to a more persistent grammar-based methodology within the control group. Here, the activities developed were mainly based on drilling and repetition of grammatical structures. Although drilling does not allow students to be creative and/or active learners it may help with memorizing language and provide a focus on accuracy. Unlike the experimental group, these participants followed principally the activities proposed by the textbook, which are mainly grammar-oriented. Regarding motivation and group work, we can appreciate from table 2 that there is not much difference between both averages. Still, some conclusions can be drawn from these rates; first of all, group work high scores reveal that students actually enjoy and make the most of working cooperatively, this is an indicator of the effectiveness of the pedagogy carried out by the school, for the reason that students incline toward group or pair work rather than individual work. Moreover, motivation seems to be linked to factors other than the methodology used in the classroom. As their English teacher, I feel gratified about the rates since they show that I am able to keep students highly motivated regardless of the methodology I use with them. I believe of the factors that influence students' motivation at this age, the teacher's attitude is probably the most important. Conversely, and although not reflected on the table, direct observation of both groups along the project allowed me to perceive that the experimental group was much more motivated during the lessons.

Table 2

End of the project analysis comparing average value answers from experimental and control group on a scale of 1 to 5

	Control Group Average Scores	Experimental Group Average Scores
Grammar structures	3.35	3.08
Vocabulary	2.34	3.29
Motivation	4.95	5.00
Participation	3.24	4.49
Group work (Interpersonal I.)	4.39	4.50

Nonetheless, the most significant shift can be appreciated when looking at «participation» and «vocabulary» sections. Here, the differences between both groups are more substantial (around one point difference in both cases), and the experimental group performs with a higher average. Students working with learning centers based on multiple intelligences consider themselves to be more participative and engaged in the activities proposed. This is directly related to their learning styles and preferences, for the reason that activities cater to all types of learners. The activities carried out in the centers allowed students to have more freedom when learning and to follow different paces. Since activities in the experimental group were more open, and therefore less guided, participants had the opportunity to choose what best suited their demands. As a result, these children could perform the tasks more autonomously; that is to say they barely needed the teacher's help and I acted just as guidance to them. Owing to this they developed a sense of self-confidence as the project moved along.

In terms of vocabulary, it does not seem surprising that the experimental group performed with a higher average score. Whereas the control group dealt only with the vocabulary presented in the textbook, the experimental group was exposed to a greater amount of words. They were asked to make a description so as to work on the verbal-linguistic intelligence. In that description, they were encouraged to talk not only about the shops included in their cities, but also to explain the actions and/or goods that could be acquired/carried out in those shops; the same happened when creating their songs. As a result, working through learning stations allowed us to cover material we would not otherwise have had time for. Learning centers were a way to bring new material to students without taking up additional class time.

Furthermore, the last part of the project encouraged students to present their models in front of the class. This made students being in touch not only with the vocabulary they needed in order to make up their own work, but also with the words other groups included in their projects. Another important fact that is worthy mention at this point is that, after completing the rubrics, students were asked to indicate the most remarkable thing they had learnt from the project. Interestingly enough, 65 % of them highlighted «learning vocabulary» as being the most significant aspect. In that section,

they were also heartened to specify what their favorite/least favorite center was in order to draw conclusions about the dominant intelligences within the experimental group (this feature would be looked at in the following, after analyzing *table 3*, which is related to each individual learning center).

Table 3
Percentages of dominant intelligences within the experimental group

Naturalistic Intelligence	74.07 %
Verbal-Linguistic Intelligence	22.22 %
Logic-Mathematical Intelligence	18.51 %
Bodily-kinesthetic Intelligence	81.48 %
Musical Intelligence	77.7 %
Visual-Spatial Intelligence	59.25 %

Table 3 shows that the most dominant intelligences within the experimental group are mainly three: naturalistic, bodily-kinesthetic and musical. The group interviews, as well as the observation carried out during the project, reaffirm this fact. During the interviews, students were asked if they were enjoying the project and whether they found it useful for learning. Most of them stated that what they enjoyed the most was «actually playing the instruments», «decorating the boxes» and «going out to the playground to collect things». Surprisingly, the centers focused on these intelligences barely required teacher assistance, and allowed students to perform the tasks more freely. Furthermore, these tasks empowered students to be more creative and expressive. On the contrary, verbal-linguistic and logic-mathematical intelligences appear to be the least popular among students. These percentages seem very revealing since most of the Spanish Curriculum is focused on Spanish Language and Math's (i.e. 11 hours a week out of 26 in second grade). Conversely, those subjects that are more related to the most

popular intelligences according to this study, such as physical education, music and/or arts only occupy around 3 hours a week.

Table 4
Percentages of preferred centers among the experimental group according to the interviews

	Favorite Center	Least Favorite Center
Naturalistic Intelligence	18.51 %	11.11 %
Verbal-Linguistic Intelligence	–	55.55 %
Logic-Mathematical Intelligence	–	25.92 %
Bodily-kinesthetic Intelligence	29.62 %	–
Musical Intelligence	59.25 %	7.40 %

As observed on *table 4*, both the favorite and least favorite centers specified by students, match the dominant/less dominant intelligences indicated above. Moreover, the 44.44% of participants indicate «learning new words» as the most significant thing learnt from the project. This leads us to a paradoxical conclusion: How is it possible that students still highlight the fact that they actually learnt a lot of vocabulary, being the verbal-linguistic intelligence one of the least popular? Once again, this is closely related to meaningful learning. Since students are in touch with the language by doing appealing and interesting activities, it is not only about writing or reading but also about learning the words in context by actually enjoying what they do. In my opinion, this is an excellent finding since vocabulary is central to English language learning because without sufficient vocabulary students cannot understand others or express their own ideas. Wilkins (1972) wrote that «while without grammar very little can be conveyed, without vocabulary nothing can be conveyed» (pp. 111–112).

Additionally, along the project I was able to observe another important fact within the experimental group, directly related to the ability to problem-

solving. Students working through learning centers had to face some inconveniences while making up their city models. They had to deal with materials and evaluate which ones seemed better to do the decorations, how to include the natural things (i.e. some of them decided to use glue, some others agreed playdough was a better option, etc.). Having to face real-life problems contributed very positively to their problem-solving skills and made them much more efficient and resolute. These children had also less trouble developing group work strategies, and they were able to reach agreements more easily than the participants in the control group. As a final point, 100% of the students in the experimental group indicated that they would like to work through learning centers based on multiple intelligences with other topics in the English classroom.

Although intrapersonal intelligence has not been mentioned within the rest, it can be appreciated by taking a look at table 5 that actually more time was needed during the project in order for students to reflect on the things they were doing. It is true that the lack of time added to the length of the project, did not allow us to have as much inner thinking time as I would have liked. Nevertheless, as mentioned above, students consider themselves as being quite self-critical in terms of recognizing their strengths, weaknesses and capacities. They also believe they were able to control their stress level and behavior; this is something that could be appreciated through observation of the experimental group, since they barely had significant problems along the project. Moreover, by analyzing the rubric, it can be stated that the vast majority of them prefer working in small groups rather than individually.

Table 5

Percentages of interpersonal intelligence skills

Auto-critic	74.07 %
Learning preferences (working individually)	7.40 %
Self-control	96.10 %
Reflection	23.47 %

Finally, this project did not only have an impact on students, it also had some clear advantages on my side as teacher. Having students working in groups allowed me to have one on one time with them. When teaching in a regular class, I find it very hard to spend time with each of them individually. However, while children were working in learning centers around the room, I was able to check in with each of them, point out any correction needed, and evaluate their performance. This also offered me opportunities to pull students aside and clear up mistakes they were making on a consistent basis. Students working independently at learning stations enabled me to have necessary conversations during class without bringing attention to a student's performance, and I could make sure each one got the attention they needed from me.

4.3 Plan of action

In the light of this, a plan of action seems necessary in order to establish other ways of working that enhance English language learning in a Primary Education context. When teaching students English, we should be aware of the differences in learning styles of our students so that all learning styles can be incorporated into our lessons. Being able to identify the dominant intelligences among our learners will help us ensure they make the most of the learning experience. Therefore, the most important part to start with, would be by knowing our students strengths and weaknesses. Although this may seem hard at the beginning of the school year, rubrics have been proven to be an effective tool when it comes to information gathering about multiple intelligences. Such information can help us plan the lessons in advance and also develop group cohesion dynamics during the first weeks of the course. Dynamics dealing with making multiple intelligences wall charts, creating posters in which each student categorizes their own intelligences, guide debates, observing students during recess, talking to parents, etc. would be very helpful for us. At this very point, it is important to inform students about what multiple intelligences are (they might not know) and how they can be manifested, so they become aware of the types of learners they are, in a way it could be like knowing their educational «blood type». There are some high quality children-oriented videos on the internet that explain the theory of multiple intelligences. Also, round tables where children can freely talk about the issue can be carried out in class.

Here, it is important to inform children that intelligences can be modified, and that every human being is intelligent in at least three different ways.

I believe this could be very positive for both students and educators since it will put down barriers and roles in the classroom. There will not be more of «these are the intelligent students and not the rest». Thus, it will favor to enhance an atmosphere of mutual respect. Mutual respect in the classroom encompasses more than the interaction between students and the teacher, it means that students also treat each other properly. The result is a classroom where another dimension of learning takes place as students feel safe, motivated and, of course, respected. Achieving this atmosphere takes considerable effort on the side of the teacher as well as the students. Once established, however, students will usually work to maintain the positive classroom environment.

Nevertheless, knowing students' intelligences is just the first step up the ladder, since some kind of formation would also be needed by the teachers' board. Such formation can consist of courses or conferences that eventually enable educators to know the theory in depth and to put it into practice. In Gardner's view, MI theory is used most effectively by educators who have particular goals they are seeking to achieve and who conceive of the theory as a tool for achieving this goal (Gardner, 1983). So we, as teachers, should first make our educational goals clear in order to start planning a unit (or project) based on multiple intelligences. Regular teacher meetings would also be necessary to keep track of the progress both students and teachers are making, and to evaluate the kind of activities and dynamics carried out in the classroom.

Once the strategies are set up, it will be time to start working in classroom. As put forward by the current research, a methodology based on learning centers would surely work, since it offers specific spaces that cater to the different intelligences. All the same, regardless of the methodology used a set of diverse tasks should be offered to students. It may happen that the lack of space in the classroom hinders the proper distribution of the learning centers or, on the contrary, when having a new group of students without a prior knowledge as to how centers work may me feel insecure when carrying out this methodology. In this case, one session within the unit/project can be addressed to each intelligence, and be worked in small

groups within the class group. Anyhow, students' demands of kinesthetic, musical and naturalistic activities have been revealed, and this is something that should not be overlooked when planning and designing our teaching units.

Group work is also of paramount importance here, and students need to be trained before, during and after, otherwise it can turn into a double-edged sword. As it has been proven, group work can be an effective method to motivate students, encourage active learning, and develop key critical-thinking, communication, and decision-making skills. But without careful planning and facilitation, group work can frustrate students and feel like a waste of time. Therefore, it is important that each student performs a role in the group and that each member is aware at any given time of what they are expected to be doing.

Finally, I truly believe students need to be offered more freedom when learning for this gives them autonomy and makes them the center of their own learning. There is a common misconception based on the belief that the more a teacher manages the classroom the better. Over-management has been proven to cause more misbehavior than it dissuades, since it reduces children's natural desire to make choices, solve problems and explore their world. One thing I have personally learnt from this research is to be more relaxed and trust students when driving the wheel of learning. In the light of the results obtained, we as teachers should have more time to «sit back and enjoy students' performances».

5. CONCLUSION

The original purpose of this project was to discover whether a methodology focused on learning centers based on multiple intelligences could enhance English language learning. Based on the analysis of all data collected through different sources, this approach has been proven to favor not only language acquisition, but also a diverse set of skills that will help students inside and outside of school. In this sense, some conclusions can be drawn.

In terms of the language, combining multiple intelligences theory with learning centers has been demonstrated to have a powerful impact on stu-

dents. Although the grammatical aspect has barely experienced a shift between methodologies, vocabulary acquisition has been positively influenced. Therefore, more opportunities should be given to students in which they can experiment and play with the language in order to make sense of it. This will enable students not only to retain and remember vocabulary items better but also to make learning enjoyable and meaningful. Since this project required very little teacher interaction, students could freely interact with each other and reach agreements proposed, arranged and chosen by themselves within the group. Moreover, most of the observation developed along the project, as well as students' individual assessment, was feasible due to the needlessness of teacher interaction. This also enabled more one-on-one time with students in order to focus on different skills they needed practice on.

Along this line, from the analysis of students' answers about their favorite centers, it has become clear that we should create activities that comprise musical, naturalistic and kinesthetic intelligences. It is a reality that schools still tend to focus more on verbal-linguistic and logic-mathematical intelligences, and we should not overlook students' preferences. Although very little of the school schedule is dedicated to subjects that mainly focus on these abilities, we should provide students with appealing tasks that cater to all types of intelligences and learning styles.

Additionally, learning through problem-solving is an effective way of engaging pupils in learning. However, problems should contain an element of challenge; otherwise students may feel discouraged if they face triviality. Giving students open questions that do not lead them to a specific answer will make their minds work towards a solution, and eventually will be much more enriching to them. In this case, students facing some troubles when making up their city models, made them learn how to deal with space, materials and how to organize themselves. As they grow up, students will have to face a huge variety of diverse problems, therefore the development of this skill will not only help them within the school context, but all the way throughout their lives.

Finally, by giving students access to the eight intelligences we are offering opportunities for self-discovery and self-acceptance. Being aware of what our strengths, capacities and weaknesses are, will help us in a variety of

ways. Likewise, multiple intelligences theory develops skills that are of paramount importance for children, not only in an academic context but also in life. All in all, knowing ourselves helps us understand others.

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Learning Centers Based on Multiple Intelligences: Enhancing English Language Learning in Primary Bilingual Education

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The Use of Short Stories and Phonemic Awareness in the EFL Classroom to Improve Students' Reading and Writing Skills

La utilización de Literatura y la conciencia fonológica en la Clase de Inglés como Lengua Extranjera para mejorar las destrezas lectoras y de escritura del alumnado

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Abstract

This study aims to analyse the impact of using children's literature in the English Foreign Language (EFL) classroom on students' motivation and reading habits, as well as the role of phonics and phonemic awareness in improving reading skills and confidence. The objectives include identifying students' reading habits and motivation in English and Spanish, identifying difficulties in reading English and the impact on motivation, analysing perception of time spent in reading activities, and studying the correlation between phonemic awareness and phonics in building better readers. The study will also examine the amount of new words acquired through the process and draw conclusions about the role of motivation in reading and language learning. The results show that the use of short stories in the classroom, combined with phonemic instruction, can be considered as a valuable tool in the English language classroom for students of all ages, as they helped students to increase spelling and vocabulary acquisition. Both factors in combination have helped to increase motivation among students towards language learning. Apart from that, this combination of factors creates a synergy in which there is a continuous feedback loop between them.

Key words: literature, motivation, phonemic awareness, reading skills, confidence, language learning.

Resumen

Este estudio pretende analizar el impacto del uso de Literatura infantil en el aula de Inglés como lengua extranjera en la motivación y hábitos lectores del alumnado, así como el rol de la fonética y conciencia fonológica en la mejora de las destrezas lectoras y confianza lectora. Los objetivos incluyen la identificación de hábitos lectores y motivación tanto en castellano como inglés, así como la identificación de las dificultades en la lectura en lengua inglesa y su impacto en la motivación. Analizando la percepción del tiempo empleado en actividades lectoras, así como la correlación entre la conciencia fonológica y fonética y el desarrollo de mejores lectores. El estudio examinará la cantidad de nuevo vocabulario adquirido en el proceso y aportará evidencias sobre el rol de la motivación en la lectura y aprendizaje de idiomas. Los resultados muestran que el uso de Literatura infantil, combinado con instrucción en conciencia fonológica, pueden considerarse una valiosa herramienta en la clase de lengua extranjera ya que ayudaron al alumnado de todas las edades a mejorar la adquisición de vocabulario y el deletreo. Además de esto, ambos factores en combinación han mostrado un aumento la motivación entre el alumnado hacia el aprendizaje de lenguas, creando una sinergia de continua retroalimentación entre ellos.

Palabras clave: literatura, motivación, conciencia fonológica, destrezas lectoras, confianza, aprendizaje de idiomas.

1. INTRODUCTION

In recent years, the focus of language teaching has moved from traditional grammar and vocabulary to functional language structures for communication. The goal for students is to develop communicative competence, which can be achieved through the integration of speaking, reading, writing, and listening in a balanced and meaningful way. Teachers are encouraged to adapt their methods to meet students' needs and use a variety of resources such in order to provide a meaningful context for communication. There is evidence to suggest that incorporating literary texts, such as short stories, into language learning can be beneficial for students of all ages (Collie & Slater, 1991; Hiervela & Boyle, 1988; Pardede, 2010). By exposing students to a wide range of vocabulary and syntax, promote critical thinking and creativity apart from language skills. Short stories can offer a multicultural context and a valuable insight into the real-world use of the language, helping students to become more familiar with different cultures. Using realia, or materials not specifically designed for language learners but used by native speakers, can also be beneficial as it exposes students to language that is more authentic and closer to how it is used in real life (Swaffar, 1985). In order to become effective users of a language, students need to be competent communicators and successful readers. There are two main approaches to reading instruction: a skills-based approach and a whole-language approach (Samuels & Kamilm, 1988).

The skills-based approach to reading instruction emphasises the role of phonological awareness and abilities as foundational skills for learning to read and write. It also involves decoding letters and words, and using reading as a means of gathering new information. Regarding the complexity of text comprehension and response both are increased progressively, culminating in more natural conversations (Anderson 1992). It is highly sequenced and draws attentive to phonological awareness and reading abilities as crucial for learning how to read, whereas meaning plays a secondary role to be devoted utterly.

Recent research suggests that a combination of phonemic awareness and phonics is necessary for teaching reading skills and constructing meaning (Adams, 1994; Anderson, 2005). Children should be encouraged to read aloud and recite what they have understood from the text. The ability to

understand the information read is essential for reading instruction. Improving recognition of letters and the ability to distinguish them from phonemes can aid in the reading process. (Adams, 2005). More recently, Snow, Burns and Griffin (1998) suggested that «phonological awareness and phonological abilities play a vital role in learning how to read» (as cited in Anderson, 2005, pp. 15-18). Effective second language reading also requires students to develop various skills, such as scanning for specific information, skimming for general understanding, predicting words and structures, inferring opinions and attitudes, and actively engaging with the text (Harmer, 1998).

Research has shown that the development of higher order thinking skills as well as critical thinking skills become important for language learning in the English as a Foreign Language (EFL) classroom. Those included among this group are the ability to understand connections between languages; use prior knowledge to deduce meaning; identify language patterns and how language is used to express attitudes and ideas; as well as understanding how language is used for different purposes (Chamot, 1995; Tawin & Al-Arishi, 1991; Chapple & Curtis, 2000; Davidson, 1994, 1995).

While much research has been done on reading methods and their impact on reading skills and higher order thinking skills development (Carnine et al., 2010; Snow et al., 1988), little attention has been given to the relationship between motivation and reading skills development and how they are mutually interrelated. Therefore, my study addresses the following questions:

- How can phonemic awareness help students improve their reading skills and word recognition?
- How does word recognition affect the process of vocabulary learning in context?
- Does the use of short-stories lower students' levels of anxiety and how are their reading habits affected?
- How can improving reading skills affect students' motivation towards foreign language learning?
- How are students' levels of anxiety lowered as their reading skills improve and how are their reading habits increased?

The above questions led to the following hypothesis: the lack of reading skills affect students' motivation towards reading and, consequently, towards foreign language learning. By working on phonemic awareness, students' word recognition will be improved. As a consequence, reading skills will be developed. This in turn will have a positive effect on their vocabulary acquisition.

2. LITERATURE REVIEW

2.1 Children's literature: some introductory remarks

Children's literature emerged as a distinct form in the 17th century and evolved in the 20th century in the United States. The educational ideas of Locke (1632-1734) and Rousseau (1712-1778), which focused on habits, social conventions, and the interplay between nature and nurture, significantly influenced modern notions of education.

Literature is now viewed as a tool to improve communicative abilities and language acquisition through reading, with extensive reading instruction being demonstrated to have positive effects on language learning. Teachers should include literary texts as a means of helping students acquire the target language in a natural and effective way. The use of literature in language teaching has evolved over time, with a shift towards communicative approaches in the 1970s. Extensive reading instruction has been shown to have positive impacts on language learning (Bamford & Day, 1994, 1997).

A variety of reading techniques, such as reading aloud, shared or guided reading, should be tailored to students' age, interests, and needs. It is also crucial to help students develop their listening skills, including the ability to sound out letters and blend them, in order to promote fluency in reading. Reading stories to our students helps to develop the four basic linguistic skills (listening, speaking, reading and writing) in an interrelated manner. At first, we should be training our students on listening skills. Then, they will practice their speaking as they make predictions or get the general gist of a passage. As suggested, these two skills should precede reading and writing, especially at early stages of their

learning process. However, by reading to our students, we are helping them to build on their reading and as a consequence, their writing would be positively affected.

Learning how to read and write fluently is vital for our students in both L1 and L2. Recent studies agree on considering phoneme recognition as a predictor of early reading skills (Hulme et al., 2002). Therefore, learning how to decode letter symbols into sounds and identify sounds and their written form becomes an essential part of their training as fluent readers. This process is known as phonemic awareness. Teaching students pronunciation should be part of our daily routine in the classroom. It is important for our students to be aware of sounds in English language as it helps them to improve their comprehension of the spoken language. As Carruthers (1987) mentioned, «since the sound system is an integral and inseparable part of any language, the study of pronunciation must form an important part of an ESL program, arising naturally from other lesson material» (pp. 194-195).

As a result, they need to be trained in how to spell words. Moreover, in order to foster an adequate spelling acquisition, instruction in phonics becomes necessary (Seymour, 1992; Seimur et al., 1992). Explicit and systematic instruction in English spelling has a significant and lasting impact on orthographic performance, which is notably different from the incidental growth in spelling (Cañado, 2003).

2.2 Reading models

Different reading models can be considered when designing our lessons, the cultural, language, and personal growth models can be used to achieve desired outcomes (Carter & Long, 1991). These models alter the roles of both students and teachers, with students becoming more involved and teachers facilitating the learning process rather than adopting a teacher-centered approach.

The cultural model focuses on the value of literature as a source of knowledge about language and culture, with a focus on using literary texts to learn about history (Carter & Long, 1991). The student is encouraged to interpret the text but, there is only one possible interpretation and this unique interpretation of the text is transmitted to the students. This

model is clearly centred in transmission of knowledge and therefore, students play a passive role, being a teacher centred model.

As far as language model is concerned it focuses on using literary texts to improve vocabulary learning and acquire new language structures, rather than fully understanding the whole text. Within this model, teachers guide the students who play a more prominent role in the classroom (Carter & Long, 1984).

However, the personal growth model aims to engage students in reading literary texts and help them become more effective readers, with a focus on the individual student's interaction with the text and encouraging reading as a personal and social activity. This model is well-suited for more communicative approaches to language teaching as it encourages students to discuss and analyse the meaning of texts and share their ideas with others, creating a natural context for communication. Teachers must be prepared to challenge students' use and knowledge of the language and help them develop their cognitive skills through progressively more challenging activities in terms of cognitive demand. Therefore, students' development of the language would gradually develop towards a more sophisticated use of their language and expressions (Cummins, 1981).

2.3 Storytelling in the EFL Classroom

The personal growth model is well-suited for communicative language teaching and can facilitate the development of students' language skills and cognitive capacities as it aims to promote student's engagement with texts and encourage reading as a personal and social activity. Likewise, we are creating background knowledge, which is highly important for reading comprehension (Trelease, 2011).

Reading aloud to students helps developing their listening skills and activates cognitive processes related to reading comprehension helping to develop all four linguistic skills in an interrelated manner; providing input for language acquisition that is comprehensible and slightly beyond their current level of understanding (Krashen, 1993). This can lead to increased vocabulary and improved quality in oral and written language, as well as increased fluency and accuracy in the target language through increased reading, speaking, and writing practice. Reading

also fosters creativity and imagination, making it an intrinsically motivating activity.

Basic reading strategies, such as scanning and skimming, are also important for text understanding (Krashen, 1983). As Harmer (2010) pointed out, effective listening and reading involves activating a set of sub-skills, such as predicting content through processing new words and expressions and considering the tone and context of the speaker. Effective text comprehension requires students to be able to use context and prior knowledge to understand meaning, skim for the general idea, understand details, scan for specific information, identify discourse patterns, and infer opinion and attitude. These skills allow students to organize their thoughts, visualize the story in their minds, and understand the sequence of events (Harmer, 2010). Mastering basic reading and listening skills and sub-skills, can significantly impact students' attitudes towards reading and language learning, leading to increased creativity, imagination, confidence and motivation (Garvie, 1990; Brewster et al., 2002; Enever et al., 2006; Wright, 2009).

To create a positive learning environment when using literature as a teaching tool, it is helpful to implement scaffolding strategies like using visuals, modifying complex expressions, introducing the topic, and predicting relevant words. This can help students perceive reading as enjoyable and lead to more engagement, which can facilitate language acquisition and lower anxiety. (Saito et al., 1999; Krashen, 1983).

2.4 Phonic instruction and phonemic awareness

Both in their first and second languages phoneme recognition is a key predictor of early reading skills as well as fluent reading acquisition and writing skills (Hulme et al., 2002). On the other hand, phonemic awareness, or the ability to decode letter symbols into sounds and identify sounds and their written forms, are essential for fluent reading. Regularly teaching pronunciation is crucial for language education, as understanding the sound system of the language is important for improving comprehension of spoken language (Carruthers, 1987).

However, teaching pronunciation to students can be challenging due to differences between their native phonological code and the English code; as well as the lack of correspondence between the written and spoken codes.

Nevertheless, improving pronunciation can enhance both communication skills and understanding of written and oral texts, and mental associations between written words and spoken sounds can facilitate this process. To improve spelling, 'students need training in phonics and systematic, explicit instruction has been shown to have a significant impact on orthographic performance (Seymour, 1992; Seimur et al., 1992; Cañado, 2003).

In order to help Spanish native speakers read and pronounce English effectively, it is important to identify and address potential difficulties they may encounter. Early phonetic instruction and training in supra-segmental features such as rhythm, stress, and intonation can help prevent errors from becoming ingrained and enable students to achieve an intelligible pronunciation that is understandable to native speakers. Teachers play a key role in modelling correct pronunciation and supra-segmental features for their students, with the aim of ensuring that their speech is clear and understandable, even if it carries a foreign accent. (Tench, 1992; Kenworthy, 1992; Brewster et al., 2002).

Spanish speakers may encounter difficulties when learning to speak and pronounce English effectively, such as with certain vowel and consonant sounds or consonant clusters that do not exist in their native language. English has a different stress and rhythm than Spanish, as it is a stressed-time language with clear distinctions between stressed and unstressed syllables and words. Intonation is also important in English, as it conveys meaning, emphasis, feelings, and emotions through changes in pitch. It is essential for students to be aware of basic patterns of intonation in English, as it is more «musical» than Spanish (Madrid & McLaren, 2004, p. 303). While teaching students to pronounce words accurately, it is important to set appropriate goals, rather than aiming for a native-like pronunciation. Focusing on clear and intelligible pronunciation can improve students' reading and speaking skills and increase their motivation.

3. METHODOLOGY

3.1 School and group context

The research study was conducted with a group of 17 fourth-year students, aged 9-10 years old. Conducted in a monolingual primary school located in

a rural area in Castilla la Mancha, Spain. The school has a total enrollment of 140 students, who receive three hours of English language instruction per week according to Spanish legislation. Population is diverse, including a high number of students from immigrant families and a significant proportion of students from low and medium-income families who receive free meals.

All the students have had some exposure to English since they were 3 years old, and four of them have been diagnosed with attention disorders. The study compared the results of traditional teaching methods for vocabulary learning and spelling to those obtained through the use of short stories, direct spelling training, and intensive phonics training¹.

3.2 Method

This study focuses on using short stories (fictional or traditional) as children's literature in the classroom, with a focus on illustrated books as a scaffolding resource to aid understanding. The available resources and titles in the market offer a wide range of options to meet students' needs and align with the curriculum. Children's literature is believed to initiate children into literature (Meek, 1982).

3.2.1 Phonemic awareness

The research study incorporated the use of phonics, specifically using synthetic phonics materials, in order to improve students' spelling and vocabulary learning. A total amount of 13.5 hours phonics training over a period of nine weeks, with daily sessions lasting 30 minutes. Mainly focused on teaching students the sounds, songs, and movements associated with each sound. Phonics training included the use of songs and actions to associate sounds with specific movements. Sounds were practiced in groups over a period of three days, and students then practiced simple blending using images and letters to match words. Word-writing dictation was also practiced.

¹ Since there is only one group of students per level in this school, they are the only group in fourth year for this study. It was not possible to have a control group.

After mastering initial and final blending, students in the research study moved on to practicing initial consonant blending and final word blending, using sounds, movements, and dictation. Followed by a challenging matching activity in which students had to match initial sounds, images, and words, as these words often included irregular patterns that tested their understanding of the sounds. During word dictation and blending practice, students used lists of words provided by a synthetic phonics method, including tricky words that are difficult to read through blending and listening for sounds. These words included alternative spellings, such as «like» and «my,» and were practiced every other day after the 8th week of training.

In order to practice sentence dictation, the research study used «sentence sticking» activities from the synthetic phonics method, as well as modified activities where students had to fill in missing words in a sentence and match it with the correct picture. Students found initial and final consonant blending apart from irregular or alternative spellings particularly challenging.

3.2.2 Materials selection

Reading is an important skill for language learning that involves various cognitive processes that help readers understand and engage with texts. When selecting reading materials for language learning, it is important to consider the students' cognitive development, the variety of topics covered, and the potential to enhance motivation and self-esteem. Ellis and Brewster (2002) also recommend considering linguistic, psychological, cognitive, social, and cultural elements, as these can help develop vocabulary, thinking strategies, social values, and cultural understanding in students. Aspects such as vocabulary and structures, literary devices, and the content of the story, as well as psychological factors such as illustrations and layout should be considered as well within the selection process. Bearing in mind factors such as the age and language proficiency of the students can be also beneficial for the students.

3.2.3 Traditional activities to teach vocabulary

Two sessions were designed in order to teach vocabulary using traditional activities, following the suggestions provided in a textbook. Students worked

in pairs or as a whole group, and the seating arrangement was kept in a horseshoe configuration without being modified. The length of the sessions varied, lasting between 60 or 45 minutes, as a result this affected the number of activities planned.

- *Session 1:* the first activity started with a chant in which students listened to the vocabulary and repeated the words out loud as a whole group. Followed by a listening comprehension task in which students had to listen to a recording and recognize the different elements related to the vocabulary by saying the numbers that appeared in the pictures, also done as a whole group. The third was a game using flashcards as a practice stage, in which students matched words and flashcards and played «What is missing?» as a whole group. The last activity was a practice in the activity book, in which students worked in pairs to match images and words and fill in gaps in sentences using the vocabulary given.
- *Session 2:* firstly, students participated in a brainstorming and flashcard matching activity to review previously learned vocabulary. In the practice stage, they listened to a quiz and completed a fill-in-the-gaps activity in their workbooks as a drilling exercise. The final activity of the lesson involved producing a small writing using the vocabulary from the lesson. This session lasted for 45 minutes.

3.2.4 Activities for the use of short stories

The activities for reading and writing in this research study were designed using a bottom-up approach, which emphasizes the importance of starting with the most specific levels of language (such as letters and words) before constructing the overall meaning of the text. This approach suggests that readers process individual letters and words before constructing the meaning of phrases, clauses, and sentences (Paran, 1997, pp. 2-3).

Literature can improve listening and reading skills in the classroom. Careful activity planning can guide students through pre-, while-, and post-stages of listening and reading activities. Therefore, providing background knowledge and engage students through questions and hypotheses should be the point of departure. Followed by extracting meaning

through context as they enjoy the activity. To finally use the language of the text for a different purpose through various activities.

Careful design of the activities and strategies to be used, will undoubtedly help students to develop reading sub-skills such as predicting, skimming, scanning and inferring meaning from context as we work on receptive skills. As per receptive skills we understand listening and reading. In the pre-reading stage, it is important to engage students' interest and provide them with background knowledge as we prepare them for the reading.

In order to help students develop listening and reading skills, various activities were designed to focus on predicting, skimming, scanning, and inferring meaning from context. These activities included pre-reading stages to provide background knowledge and stimulate student interest, while-reading stages to develop sub-skills, and post-reading stages to internalize language through various activities. Vocabulary was introduced before reading to increase confidence, and activities progressed from word recognition to reading comprehension. The final task involved creating new writing with the learned structures.

In order to encourage cooperative learning and promote student autonomy, changes to the seating arrangement were made, grouping students in a way that balanced ability levels and encouraged collaboration and peer evaluation. Scaffolding was also provided through the use of multiple mediators such as physical aids, linguistic support, and non-linguistic cues. Additionally, tasks were designed to progressively move from lower-order thinking skills to higher-order thinking skills, in which the main aim was to support student learning and promote the development of higher-order thinking skills.

3.2.5 From theory to practice

A lesson plan for a reading intervention using a short story was divided into four sessions, incorporating activities that promoted all four linguistic skills and progressed from lower to higher cognitive demand. Various groupings were used to engage and motivate students as they progressed from word level to text level comprehension.

- *Session 1:* during the first reading session, three stages were addressed through various activities. One pre-reading activity involved activating prior knowledge through the recollection of

words related to feelings. Another pre-reading activity involved observing the book cover and making predictions about the story through the asking of questions related to the visuals. These activities aimed to arouse student curiosity and facilitate engagement with the material.

A third activity was implemented during the reading stage and involved providing students with main words related to feelings using colourless pictures. Students worked in groups to match the pictures with the corresponding feelings as the story was being read aloud. The aim of this activity was to enhance reading and listening skills, as well as to improve multitasking abilities by providing both oral and written information. The activity also reinforced the connection between written and spoken language.

The fourth activity was a post-reading activity in which students worked in pairs to complete activities in their booklets in order to develop cooperative working skills and reinforce vocabulary learning, while also practicing spelling.

- *Session 2:* during the second session, three activities were planned. The first activity was a pre-reading activity that involved recalling words and colours related to emotions in order to activate prior knowledge and work on the remembering stage of the learning process.

The second activity was a while-reading activity that involved reading the story to the students and asking them questions about the sequence and meaning of words within the story, encouraging them to use context to facilitate understanding and make connections to their prior knowledge. This activity aimed to help students understand the meaning of words and work at the understanding level of the learning process. At this stage, students worked with manipulative materials to match characters with different parts of the text as the story was being read. This activity aimed to improve listening skills, multitasking abilities, reading speed, and understanding of written and oral messages, as well as to strengthen the ability to remember, organize, and connect new information with previously learned material.

During the third activity of the second session, students were given manipulative materials and worked in groups to match new words from the book with their definitions and meanings in Spanish. Each group was given a set of words to match and were provided with a panel to check their answers after completing their chart. The completed charts were then displayed for the other groups to use to complete their own «dictionaries». The aim of this activity was to reinforce vocabulary learning and engage in guided reading at the word level, requiring students to identify definitions, observe the context of the story, and make predictions based on their prior knowledge and the context of the story. This activity focused on applying learning strategies and required students to solve problems through the use of their prior knowledge and the context of the story. Students worked in pairs on activities 4 and 5 in their booklets, which included creating a dictionary with new words and completing a crossword, in order to reinforce vocabulary learning and spelling, and encourage peer work and peer assessment.

- *Session 3:* during the third session, four activities were planned. The first activity was a warm-up and while-reading activity in which students matched the different parts of the story with the pictures and sequenced the events. This activity aimed to activate students' schemata and help them remember and apply their knowledge to sequence the events in the story.

During the second activity of the third session, students worked in pairs on a fill-in-the-gaps activity in their booklets with the aim of exploring the text in greater depth and internalizing the events, words, and meanings. Students worked in groups on a post-reading activity involving the exploration and analysis of information from the text through the creation of a spider web diagram. This activity aimed to engage higher-order thinking skills (HOTS) and required students to analyze and diagram information.

The last activity was a post-reading in which students classified different feelings as positive or negative and provided evidence from the text to support their classification. This activity required students to evaluate the information obtained from a written text at a higher level of cognition.

- *Session 4:* during the fourth session, students engaged in a post-reading activity at a higher level of cognition. As a group, they discussed the problem the monster in the story had and made hypotheses about the plot. They also connected the monster's feelings to their own experiences and designed a new monster individually, describing a different feeling using the structures from the story. This activity required students to engage in higher-order thinking skills by creating their own design and writing their own piece of text.

Students created their own monsters based on personal experiences and worked on their writing skills by planning and writing a personal piece of guided writing. These activities aimed to provide opportunities for interaction with the text by relating the story to students' own lives and giving them a meaningful context for communication in which they felt free to share their experiences and took risks in expressing themselves and exploring new uses of language. The goal was to offer a context in which writing had a purpose of expressing something related to students' own experiences and a real need for communication.

4. MAIN FINDINGS

4.1 Data collection

In order to identify the improvement in spelling after implementing phonemic instruction and using short stories, pre- and post-tests were administered in both spelling and vocabulary recognition in order to identify the improvement in spelling after implementing phonemic instruction and using short stories. By comparing traditional teaching methods and the use of short stories combined with phonemic instruction.

4.1.1 Pre-test and post-test in vocabulary and spelling without using short-stories

Starting by a pre-test for previous vocabulary knowledge, a list of eight English words was presented; requiring students to write the corresponding meanings in Spanish before receiving any instruction. Following a

vocabulary presentation stage and drilling activities focused on vocabulary recognition, the same test was administered again. The results of the pre- and post-tests were compared, with misspelled words and incorrect meanings both being treated as incorrect responses.

4.1.2 Pre-test and post test in vocabulary and spelling using short-stories and phonemic instruction

The second part of this study involved administering a pre-test for spelling and vocabulary recognition before introducing short stories and phonemic instruction in the classroom. A list of ten words related to the story were dictated for students to write on a grid, those words carefully selected to align with the sounds that would be trained on using the synthetic phonics method. After completing phonics training and working with the short story, students were tested again on spelling using the same list of words dictated by the teacher. The results of the pre- and post-tests were then analysed and compared.

Both pre and post-test were used to assess students' vocabulary acquisition. Before any intervention, students were given a grid with ten words and asked to write their meanings in Spanish. After the intervention, the same group of words was tested again in a post-test. For both tests students were given a limited time in order to complete them. The spelling tests were administered through dictation, while the tests assessing meaning association were completed through direct answers. Covering in both cases the same content. Misspelled words and incorrect answers related to meaning were considered incorrect responses and treated as such in the analysis of the results.

4.1.3 Reading habits, environment and motivation

A questionnaire was used to gather information about the reading habits of the students, including their habits in Spanish and English and the influence of their environment, specifically focusing on family reading habits and the availability of materials at school and at home. A Google forms questionnaire was used and the main objective was to investigate the students' motivation towards reading in English and the frequency of short story use by other teachers. This information was gathered through

direct questioning in the classroom. Normally student's choice is limited by teachers materials selection. I asked students about their favourite and least favourite activities and the reasons for their preferences at the end of each session as I wanted to understand how the different tasks suggested affected students in terms of motivation and self-esteem. This information was gathered and recorded in my session diary.

4.1.4 The use of short stories in the EFL classroom by other teacher-colleagues

I was also interested in gathering information from primary school teacher colleagues at non-bilingual schools on their use of short stories and the reasoning behind their choices. To do this, I asked them to complete a questionnaire using Google Forms, which focused on the benefits of including short stories in their programs. I also wanted to know if they were using short stories, what benefits they would highlight, and if they were not using them, what the reasons behind this decision were. I relied on the responsibility and honesty of the participants in regards to ethical considerations.

The research results, obtained from a small group of students in a rural area, cannot be generalised but can be applied to this particular school and others with similar characteristics. The results of the questionnaire completed by teacher colleagues at non-bilingual schools provide insight into the situation in this area and in these types of schools.

4.2 Main findings

4.2.1 Students' reading habits

The environment was defined as including the reading habits of the students' parents and access to reading materials. The results showed that 35.3 % of the students reported that their parents always read at home, 41.2 % reported that their parents sometimes read at home, and 23.5 % reported that their parents never read at home. Additionally, 29.4 % of the students reported having a lot of books to read at home, 52.9 % reported having some books, and 17.6 % reported not having any literature at home.

Students were asked about their reading habits at home in their free time in order to understand the relationship between their environment (e.g.,

reading parents and access to reading materials) and their reading habits. This was done with the belief that belonging to a reading family and having access to reading materials can foster a desire to read, whereas the opposite can be a hindrance. The results showed that 17.6 % of the students reported reading a lot, 64.7 % reported reading sometimes, and 17.6 % reported never reading at home. More than half of the students reported that English books are too difficult and, as a result, they never read in English. 35.3 % of the students considered English books difficult but still read them sometimes, indicating an interest in reading but potentially using materials beyond their language proficiency level.

Most students within this study when encountering new or difficult words in a second language, they tend to focus on those words rather than the overall meaning of the text. This is something they are able to overcome when reading in their first language, as they can continue reading even if they do not understand all the words. As a result, they may be able to understand the overall meaning of the text but feel frustrated when encountering new words. It is therefore essential to teach these strategies in the classroom to help students overcome this frustration. One strategy that can be effective is extensive reading, as it provides exposure to a wide range of vocabulary and syntax that can facilitate comprehension. According to Krashen (2013, p. 17), «background knowledge is a tremendous facilitator of comprehension», and extensive reading can provide a strong foundation for further reading.

The main difficulty students face during silent reading is unknown vocabulary, while the main difficulties during reading aloud are pronunciation and unknown vocabulary. It seems clear to infer that reading promotion in English should focus on teaching students about the main sounds and proper pronunciation. This will help students feel more confident when reading out loud apart from improving their language and speaking skills.

Although the environment can impact reading habits in a first language, there are also internal factors related to vocabulary knowledge and the phonemic system in a second language that can influence reading habits those are connected to anxiety and motivation levels towards language learning and reading, as students may not feel confident enough. Reading requires

practice and is directly connected to vocabulary learning and acquisition. The more students read, the better they become at reading, both aloud and silently. Reading also helps with spelling and decoding sounds into words and letters. As students read more, their spelling improves.

Reading in a second language can be a spiral process, improving as students read more. This can positively impact motivation and confidence, leading to a more positive attitude towards learning and lower anxiety levels. As long as students feel capable of reading in a second language, they may be more motivated to push beyond their limits. As a result, teachers should allocate time for reading aloud in their lessons. It is important to select appropriate materials for students, but also to allow them to choose materials that are personally interesting or more accessible for them in terms of reading and comprehension.

4.2.2 Phonemic awareness and vocabulary learning

1. Results obtained before and after using traditional teaching methods.

As the analysis showed there is an average improvement of 38.24 % in students' spelling mistakes after the intervention. Most errors were due to differences between the English and Spanish phonemic systems. Most of the mistakes were related to transfer from the students' first language (L1) to their second language (L2). Common mistakes included misunderstanding the sound of digraphs or bad consonant sounding. The largest improvement observed was a 58.82 % however, some students continued to make mistakes due to the transfer of sounds between languages.

An analysis of the differences between students' answers in the pre-test and post-test showed good progress, considering that these students had not previously received formal phonemic instruction and their results were based on memory and routine. Most students were able to understand most words, but had difficulty finding the sound-spelling correspondence in English, often relying on their knowledge of the phonemic system of their native language. It is important to note that some of the students in the study were already speakers of a second language at home, as they spoke Polish or Romanian and received instruction in written language in both Spanish and English.

The results showed an average improvement of 56.6 % in vocabulary learning after a traditional teaching intervention. A detailed analysis revealed that students had an easier time learning words with Latin roots, as they could rely on their knowledge of these words in their first language. Nevertheless, some of the words needed a bit more practice since after extensive practice at word level most students still have some difficulties with the meaning of these words, most specifically in those, which have little relation to their interests and needs.

The results from this research show that traditional teaching methods can be effective in improving students' spelling and vocabulary learning, but there is still room for improvement. Implementing an intensive phonemic instruction and using short stories in the classroom can also be beneficial in improving these skills, especially in terms of helping students overcome challenges related to transferring their knowledge of their first language to the second language. It is important to carefully select materials and provide students with strategies to help them navigate unknown vocabulary and pronunciation, and to encourage regular reading practice to improve overall language proficiency. Promoting reading skills in a second language through a long-term «free reading program» in school can be beneficial for all students, especially for those who are less inclined to read in English. Providing access to appropriate materials based on students' proficiency levels and promoting reading in the classroom can lead to benefits in reading in the second language both in school and at home. Research has shown that free reading is particularly effective in promoting English as a foreign language (Krashen, 2007).

It is clear that students' interests and habits play a role in their ability to learn vocabulary, and that traditional teaching methods can improve their skills in spelling and vocabulary learning. However, it is also evident that some words are more difficult to learn, particularly those that do not have clear correspondences with their first language. Implementing intensive phonemic instruction and the use of short stories may further improve students' language skills, and it is important to consider the use of materials that are suited to students' proficiency level and interests. Additionally, incorporating opportunities for practice and routine can help students to automate the decoding process and establish stronger connections between sounds and written forms.

2. Results obtained before and after using intensive phonics instruction and the use of short stories.

The results of the study showed that the implementation of intensive phonics instruction and the use of short stories in the classroom had a positive impact on the students' spelling abilities, with an average improvement of 49.41 %. However, it was also noted that some students still relied on their first language reading and writing skills, leading to mistakes in their spelling performances. Further analysis will focus on the most difficult words for the students and the influence of phonemic instruction on their post-test results.

However, some students still struggled with certain sounds and digraphs, particularly when they were relying on their first language for spelling. The use of synthetic phonics method and short stories seemed to be effective in improving the students' spelling abilities, but further practice and instruction may be needed to fully overcome these challenges.

In terms of the effectiveness of phonemic instruction and the use of short stories in improving spelling and vocabulary acquisition in English language learners showed an average improvement of 49.41 % in spelling and 56.6 % in vocabulary. The students performed better on words with Latin roots and struggled more with those that had little relation to their interests and needs. Intensive phonemic instruction was found to be beneficial for all students, although their individual capacities and interests also played a role in their improvement. The combination of phonemic instruction, systematic spelling instruction, and the use of short stories was seen as an effective method for improving writing skills in terms of spelling.

In general, the results obtained in this analysis show a positive impact on the students' vocabulary acquisition, as they were able to make connections between their prior knowledge and the new words they were learning, and they significantly improved their understanding and use of these words. Additionally, the results indicate that some words were easier for the students to learn than others, possibly due to the prior familiarity with the concept, or the presence of similar words in their mother tongue. Overall, these results suggest that the combination of short stories and phonemic instruction can be effective strategies for improving vocabulary acquisition in a second language.

Individual student performances improved, with most students giving correct answers in the second attempt after receiving the intervention. The combination of phonemic instruction, systematic spelling instruction, and the use of short stories appeared to be effective in helping students improve their writing skills in terms of spelling and vocabulary acquisition.

All in all, the use of phonemic instruction and short stories in the classroom had a positive impact on students' spelling and vocabulary acquisition, with average improvements of 11.17 % and 14.7 %, respectively. It was found that vocabulary acquisition improved more significantly through the use of short stories, while spelling progress was boosted through the use of both short stories and phonemic instruction. Despite those results, mastering the ability to decode sounds into symbols (phonemic awareness) was a slower process that required more training and practice. Overall, the use of short stories and phonemic instruction was beneficial for language acquisition.

3. Other teachers' practices in non-bilingual schools.

Under the light of the results obtained from the survey 39.1 % of the teachers use short stories in their classrooms, while 21.7 % hardly ever use them, being used occasionally but not regularly by 34.8 % of them. Some of the teachers reported a lack of training and materials as the main barriers to using them. Other answers drew attention to the absence of training, materials, as well as the lack of time for implementation and preparation. The findings suggest that providing training and addressing these issues could lead to more widespread use of short stories in primary school English language education.

5. CONCLUSIONS

In the light of the results obtained using short stories in combination with phonemic awareness was beneficial for students, improving their spelling and reading skills; increasing their vocabulary acquisition and appeared to

be effective in improving students' language skills. In other words, the results suggest that the use of short stories and phonemic awareness can be beneficial for students' language learning.

It was observed how both interventions had a positive effect, with an average improvement of 49.41 % in spelling and 71.32 % in vocabulary acquisition. The use of short stories in particular had a greater impact on vocabulary acquisition compared to spelling. The study also found that some teachers in non-bilingual schools do not use short stories regularly in their classrooms due to lack of training and materials, as well as time constraints. It was suggested that training programs and resources should be provided to encourage the regular use of short stories in English as a foreign language classroom. Additionally, it was noted that more practice may be needed to fully improve students' spelling skills, and that an extended program combining reading and spelling instruction could be beneficial.

Despite the fact that most students have access to plenty of reading materials and their parents are good examples of readers, they do not consider themselves frequent readers in their first language. However, they read more than their parents in their first language. As a result, that leads us to believe that external factors are not determinant to their reading habits but they influence them at a certain level. As it can be seen they read a bit more than their parents, and have plenty of access to reading materials, as the school runs an intensive reading program in Spanish. However, internal factors such as lack of confidence when reading and pronouncing words as well as the lack of vocabulary prevent them from reading in English.

At the same time, their own perception about their capacities when reading in a second language plays an important role in their reading habits. As a consequence, they read less in the L2 and are unable to transfer basic reading skills they have in their L1 to the second language. For this reason, extensive reading programs in the second language are essential in schools in order to help our students to become fluent readers in the target language.

All in all, this study suggests that the use of short stories in the classroom, combined with phonemic instruction, can be considered as a valuable tool in the English language classroom for many reasons afore mentioned. The results obtained lead to certain optimism and could be used as a trigger

for those teachers who are not yet ready for the implementation of short stories in their classrooms. As this investigation shows, not many teachers are using them on a regular basis for many reasons including the lack of time for implementation, lack of training or the effort in terms of preparation time.

It would be desirable that these results could be considered for future investigations about the benefits phonemic awareness offers when developing reading skills in combination with consistent reading programs in the second language. This could be considered as a possible line of work and how intensive reading programs extended in time result as beneficial for the students learning a foreign language. Both elements combined favour language acquisition and increase the students' motivation towards language learning. It was remarkable how those students who had previously struggled with the subject showed improvement within their post-tests. I believe that a longer study would provide more accurate results on the effectiveness of phonemic awareness instruction, especially for students who have not received any phonemic instruction before.

As a researcher, I had to work with the same group of students in the absence of another group of similar age at the school. This may have affected the results of my research, as it was not possible to use the same sample for comparison. Different variables may have influenced the outcomes of the study as a result.

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MATERIALES

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A Teaching Proposal for English as a Foreign Language Classrooms: Adapting a Short Story from a Silent Short Movie to Promote the Visual-Imagery Strategy as a Reading Comprehension Technique

Una propuesta didáctica para el aula de Inglés como Lengua Extranjera: adaptando un relato corto a partir de un cortometraje mudo para promover la Estrategia de Visualización como técnica de comprensión lectora

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Abstract

This article introduces a didactic proposal for contexts of teaching English as a foreign language, whose objective is to expose students to using visualization strategies during the reading process. This proposal utilizes two of the most preferred narrative resources for teachers and students: short stories and silent short movies. Their integration in the development of the proposed activities arises from the application of the Dual Coding Theory, where verbal and non-verbal language systems complement each other, enhancing reading comprehension, memory, and language acquisition. Due to the characteristics of the resources and the strategy used, the theoretical framework's bases apply to any context of teaching a foreign language, not only to teaching English.

Keywords: short stories, short movies, imagery, dual coding theory, visual-imagery strategy, verbal language, non-verbal language.

Resumen

El presente artículo presenta una propuesta didáctica para contextos de enseñanza del inglés como lengua extranjera, cuyo objetivo es exponer al alumnado al uso de estrategias de visualización durante el proceso de lectura. Dicha propuesta hace uso de dos de los recursos narrativos preferidos por docentes y estudiantes: los relatos cortos y los cortometrajes mudos. Su integración en el desarrollo de las actividades propuestas surge de la aplicación de la Teoría de la Codificación Dual, en donde los sistemas de lenguaje verbal y no verbal se complementan potenciando la comprensión lectora, la memoria y la adquisición del lenguaje. Debido a las características particulares de los recursos y la estrategia utilizada, las bases del marco teórico son aplicables a cualquier contexto de enseñanza de una lengua extranjera, y no únicamente a la enseñanza del inglés.

Palabras clave: relatos cortos, cortometrajes, imágenes mentales, teoría de la codificación dual, estrategia de visualización, lenguaje verbal, lenguaje no verbal.

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1. INTRODUCTION

Nowadays, literacy plays the same essential role as more than 5,000 years ago. Through reading and writing acquisition, people become literate individuals capable of coping with society's demands, dominated more than ever by the written word. Under these conditions, promoting reading habits and writing skills are two of the most critical areas in Foreign Language Teaching¹.

(FLT). And similar to what happens with the literacy process of mother tongues, promoting reading in an autonomous and pleasurable way is one of the most significant challenges.

Its complexity lies in its own nature since literacy promotion requires «cultivating a culture of reading, increasing the visibility and availability of reading materials and promoting reading in all its forms, through diverse materials, online and offline». (European Commission, 2012, p. 39). Therefore, teachers are required to provide broad opportunities for students to cultivate their reading and writing skills both in and outside the classrooms of English as a Foreign Language² (EFL).

«The best of both worlds» is an English idiom that defines a situation where you simultaneously enjoy the advantages of two different things (Cambridge University Press, 2022). Such an expression portrays the essence of this article, which aims to underline the benefits that both short stories and silent short movies provide in FLT. The communion of these two modes of storytelling seizes the promotion of reading comprehension and language acquisition, the development of receptive and productive skills required in Foreign Language Learning³, and the development of positive attitudes and feelings towards literacy⁴ and autonomous learning through reading and video watching in a foreign language.

¹ Foreign Language Teaching is addressed as FLT hereafter.

² English as a Foreign Language is addressed as EFL hereafter.

³ Foreign Language Learning is addressed as FLL hereafter.

⁴ *Literacy* is understood as the development and promotion of reading and writing skills.

This article includes a series of methodological recommendations applicable in foreign language teaching classrooms through mental images or *imagery*. Mental imagery strategies are essential in the effective marriage of short stories and silent short movies, as they help students generate mental representations with visual properties that act as cognitive bridges between verbal and nonverbal languages. However, before delving into methodological matters, we will analyze the main advantages of using short stories and silent short movies as materials for imagery strategies.

2. THEORETICAL FRAMEWORK

This section will introduce three key concepts: short stories, silent short movies, and visualization strategies; three key concepts that guide the methodological proposal presented here for FLL in general, and the design of materials for EFL in particular.

2.1 Short stories

Short stories⁵ stand out as valuable reading materials in EFL contexts for promoting students' literacy in a successful and meaningful way. Their main characteristic is the length with which they portray a variety of genres, making them excellent pieces of literature suitable for working in environments with restrictive time, mandatory curricular elements, and fleeting attention spans of the student body (Parlindungan, 2012). From a linguistic point of view, its authentic and condensed lexicon provides a practical exposition of the linguistic features of the writings and its reduced structure, which illustrates how narratives are built (Sell, 2005). For this reason, S-Stories represent one of the favorite genres for both teachers and students (Kabooha, 2016).

⁵ *Short Stories* is addressed as S-Stories hereafter, reducing wordiness and easing the reading experience.

2.1.1 From literary genre to a teaching tool

S-Stories are as ancient as our human existence. Before the invention of the written word, ancient societies used stories and chronicles as a means of leisure and education, thus becoming creative methods of cultural transmission. These short literary works were initially transmitted through oral language and visual representations: the only two modes of communication before the invention of the written word. For this reason, S-Stories are strongly related to communicative purposes, where comprehension skills play a fundamental role. With the development of the written word, S-Stories diversified. And by the end of the 17th century, they were consolidated as a unique literary genre currently considered the newest of the literary genres (Patea, 2015). Since then, they evolved along with society's demands and began to acquire a solid character to convey human perspectives in a meaningful and convenient way.

These days, S-Stories represent the most versatile literary work, utilized in various formats and audiovisual registers ranging from more traditional texts of less than 10,000 words to songs, poems, fairy tales, and, curiously enough, short films. Likewise, with the rise of ICTs, stories have been able to modernize for mass distribution to fit a 280-character tweet or a 2,200-character Instagram caption. Therefore, it is safe to say that S-Stories represent the most accessible literary genre for our students today. In this context, language teachers play a crucial role in highlighting their existence around the closest reality of the student body. Going beyond traditional concepts, we can increase the visibility and availability of texts that foster a reading culture through diverse materials.

The development of S-Stories as a didactic tool is linked to the Grammar Translation Method in FLT, which originated from studying dead languages such as Latin and ancient Greek. Starting in the 20th century, linguist experts such as Hymes and Savignon determined how this practice neglects the understanding of language as a means of communication, ignoring the sense of correctness and adequacy of living languages in interaction with others. Although this change resulted in a significant discredit in the use of literature, from the 70s, the communicative approach could not but recognize its importance in language teaching contexts, for the problem was the method and not the instrument. Since then, scholars have

agreed that «those who read more show more literacy development» (Krashen, 2007, p. 2), highlighting the relationship between reading and literacy development.

2.1.2 Their benefits in FLL

Along with the literature, researchers pinpoint language learning and literacy development as the most salient benefits of S-Stories (Panavelil, 2013; Pérez Ruiz & Santamaría Molinero, 2003; Stein, 2012; Xhemaili, 2013). In summary, the following benefits stand out in contexts of FLL, although they are not limited to those listed below:

- **Linguistic development and reading comprehension:** the use of literature contributes to better linguistic awareness, a greater mastery of the language, an appreciation of literary features, and an integral development of all linguistic skills. More specifically, language and grammar activities carried out before, during, and after reading play an essential role in letting the story's meaning emerge (Stein, 2012), thus becoming authentic sources of linguistic input. Additionally, Sell (2005) and Stein (2012) consider S-Stories genuine models for language output, critical thinking, emotional awareness, and creativity, all of which are relevant in making students move from a stage of decoding to encoding and producing texts.
- **Development of critical thinking, personal growth, and work on emotions:** In Sell's words, «Better than any other discipline, literature trains the mind and sensibility.» (2005, p. 2), which allows students to grow at personal and cognitive levels. In addition, S-Stories encourage personal growth by allowing a space to share experiences, emotions, and beliefs in an environment where students do not necessarily expose themselves. Thus, students can air individual concerns through fictional characters and events without a sense of self-exposure (Panavelil, 2013; Stein, 2012).
- **Cultural development and intercultural awareness:** S-Stories benefit culture acquisition and awareness by exposing students to cultural and social practices from both the target and non-target language, which ultimately promotes cultural awareness (Xhemaili, 2013). In particular, the English language is acknowledged world-

wide as a universal communication system that allows students to learn *from* and participate *in* society on a multicultural level, starting from the English culture but including other communities with different mother tongues (Sell, 2005).

2.2 Silent short movies

Similarly, short films have also proven to be successful tools in FLT contexts. They improve comprehension and motivation through images, promote listening and speaking skills, and are highly regarded among students and teachers. The developed material presented here goes a step further and focuses on the use of silent short movies⁶. Their value for teaching lies in their development of a single idea in a visual, aesthetic form, which enhances students' comprehension of events and creates opportunities to supply the language with students' outputs, hence promoting productive skills (Donaghy, 2013). In addition, SS-Movies make students more aware of metalinguistic cues (Rinda Kartika et al., 2018) and focus on students' critical thinking skills, imagination, and comprehension of images (Hutapea & Arie Suwastini, 2019).

From a teaching perspective, S-Stories and SS-Movies can be perceived as complementary modes in which different storytelling elements are highlighted. While S-Stories are full of linguistic input and language functions, SS-Movies draw the plot in a visual, attractive, and comprehensive form. In short, the communion of these two modes is based on the idea that one lacks what the other grants.

2.2.1 From narrative instrument to a teaching tool

The film industry's history is relatively short compared to S-Stories', yet they represent one of the greatest creations used to convey narratives. Curiously, the first massively generated films at the end of the 19th century were intended to communicate daily situations, just as stories did in their origins. Likewise, cinema stood out as a means of leisure and education, revealing its use as a tool for cultural transmission.

⁶ *Silent Short Movies* is addressed as SS-Movies hereafter, reducing wordiness and easing the reading experience

In the beginning, all films were short, with an average time of less than an hour, as well as mute, introducing orchestras and soundtracks after recording to follow the scene's atmosphere. Consequently, its purpose was communicative, making the audience show their thinking skills to interpret and make sense of the visual and aural imagery composition. Although SS-Movies were relegated with the introduction of sound movies during the 1930s, SS-Movies were able to find their particular niche that lasts to this day in cartoon movies, political and social propaganda, musical clips, and even social media (Wagner, 2022). Once again, we can assert that short films represent one of the most accessible cinematographic genres for our students, which makes it crucial to highlight their existence around their closest reality and beyond mere leisure (Pérez Ruiz & Santamaría Molinero, 2003).

Around the 1970s, S-Movies embodied a crucial turning point in traditional models⁷ of FLT, as they brought different levels of «authenticity, reality, variety, and flexibility into EFL classrooms» (Stoller, 1988, p. 3). In the 2000s, its use spread significantly with the emergence of digital teaching resources that reduced the time for selecting and preparing materials (Goctu, 2017). Today, with abundant and free access to countless online teaching materials, social networks, and streaming platforms, it is easier than ever to include movies and clips as part of our teaching practice. Eventually, this enables the transmission of cultural aspects and facilitates a diversity of learning styles, strategies, and techniques (Widiatmoko, 2014).

2.2.2 Their benefits in FLL

Researchers consistently underline similar advantages to support the use of movies in EFL contexts, such as the enrichment of the teaching-learning process, the suitability for space-time constraints, and the proven enhancement of language and its contextualization along with culture, among others. Once more, researchers emphasize the following benefits, although they are not limited to the ones presented below:

⁷ The referred *traditional models* comprise the different structural methods used until the first half of the 20th century, including the Grammar-translation and Audio-lingual methods developed under the Language-Based Approach.

- **Development of a varied and transversal curriculum:** short films stand out as flexible instruments that diversify the study plan and guarantee a wide variety of linguistic and cultural experiences (Goctu, 2017; Stoller, 1988; Xhemaili, 2013). Many researchers promote its use as an integral part of the curricular design in developing the four linguistic skills (reading, writing, listening, and speaking) since they provide contextual information that contributes to the development of communicative competence (Kabooha, 2016; Hidayet, 2014).
- **Development of critical thinking, personal growth, and work on emotions:** as with stories, short films are an attractive tool with which to deal with relevant topics close to students with a wide range of group and cooperative activities, such as work in pairs, debates or role-plays (Donaghy, 2013; Kabooha, 2016; Hidayet, 2014). In addition, short films have proven effective in building students' personalities through the work of emotions, companionship, and linguistic and metalinguistic signals in authentic communicative exchanges (Kabooha, 2016). Under this context, the development of critical thinking skills arises spontaneously.
- **Development of linguistic and communicative competence:** films and series provide more authenticity than audio recordings, thus ensuring more genuine exchanges among FLL students (Goctu, 2017). Consequently, students' communicative competence develops from the necessity to be effective in the target foreign language. This translates into linguistic knowledge (such as grammatical structures), sociolinguistic notions, and functional levels of assertiveness and appropriateness (i.e., knowing *what* to speak, *when*, *to whom*, or in *what way*).

2.3 Imagery

Imagery refers to any evoked visualization in our minds, whose nature is linked to a variety of human perceptions and notions, such as sight, taste, touch, smell, feelings, words, and meanings (Kocaarslan, 2016, p. 677). Its application in educational contexts resulted in the creation of the visualization strategy, or Visual Imagery Strategy in English (Chan et al., 1990), which aims to promote active participation, processing, comprehension, and memory of words and concepts throughout the reading process. In

FLL, this visualization strategy is used to make students generate mental representations with visual properties. These images act as cognitive bridges between verbal and non-verbal languages, making reading comprehension possible (Sukanya Devi & Sia, 2020, p. 518).

2.3.1 Theories of mental imagery

Since Allan Paivio introduced the concept in 1971, multiple theories emerged attempting to explain how our minds cope with the language of images or *imagery*. In his Theory of Propositional Representation, Pylyshyn (1973) depicted mental imagery as an epiphenomenon in which the mind turns the perception of reality into symbols (Sukanya Devi & Sia, 2020; The Imagery Debate, 2022). This implies that our minds create mental propositions with external stimuli, which trigger other associated propositions. For instance, when encountering the word *flower*, our minds generate a series of propositions in relation to a personal schema of attributes that we associate with it. Likely concepts to arise in our minds might be *plant*, *petal*, *beautiful*, or *delicate*, among others.

While this theory highlights the importance of linguistic mechanisms, Stephen Kosslyn's Theory of Spatial Representation (1994) states that mental images organize around perceptual (sensory) and linguistic mechanisms (Sukanya Devi & Sia, 2020; The Imagery Debate, 2022). Kosslyn's experiments demonstrated how our minds create mental pictures of events simultaneously with other cognitive tasks (e.g., reading), both consciously and subconsciously. Also, he realized that our minds do so regardless of whether the stimulus is linguistic or sensory (i.e., whether we read/hear the word 'flower' or see/perceive a flower). Following the previous example of the flower, this theory explains that apart from the linguistic clues, our minds evoke the mental image of a flower (e.g., a green stem with leaves and a corolla of petals).

On its behalf, the latest cognitive neuroscience and psychology research try to make these theories meet halfway by claiming that *perception* and *visualization* relate to two different cognitive processes. While perception is considered a bottom-up process where external sensory stimuli trigger the creation of visual images, visualization is a top-down mechanism in which mental images generate without external stimuli. This implies that «perception occurs automatically and remains relatively stable, whereas imagery needs effort and is

fragile» (The Imagery Debate, 2022). To continue with the example, the perception process involves reading, hearing, seeing, or perceiving a flower around us, which triggers our mental image of what a flower *is* and *feels*. On the contrary, visualization involves the voluntary recovery of a particular mental picture of what a flower *is* and *feels like* to evoke it mentally and verbally.

2.3.2 Dual Coding Theory: verbal and nonverbal systems applied to reading

Although the debate is still alive between scholars, one theory stands out for its multiple applications in educational contexts. Paivio's contributions to the use of imagery have resulted in one of the most consistent theories in cognitive neuroscience and psychology: the Dual Coding Theory⁸. His theory identifies nonverbal and verbal systems for mental representations that specialize in processing imagery and linguistic information correspondingly (Clark & Paivio, 1991, p. 150). In applying his theory in education, the Visual-Imagery Strategy⁹ has emerged as an effective approach that requires subjects to create pictures in their minds during the reading process, which promotes active engagement, processing, comprehension, and recall of words and concepts (Alley et al., 1984; Chan et al., 1990; Clark & Paivio, 1991; Divine-Hawkins & Levin, 1974).

Paivio's rationale behind the application of imagery in promoting reading comprehension falls under a dual-coding system in which verbal and *non-verbal* cognitive modes interact in decoding the meaning of texts (Clark & Paivio, 1991; Nielsen Hibbing & Rankin-Erickson, 2003; Paivio, 2006). As he explains, these two systems generate different modes of representation: while verbal representations include words, concepts, events, or ideas, *non-verbal* representations include an individual language of images, or *imagery*, designed from perceptions or experiences. Connections that occur solely within each of these modes are called *associative*. Associative connections between words imply a semantic/thematic link and a perceptual/sensory link between images (Clark & Paivio, 1991; Paivio, 2006).

⁸ Dual-Coding Theory is addressed as DCT hereafter.

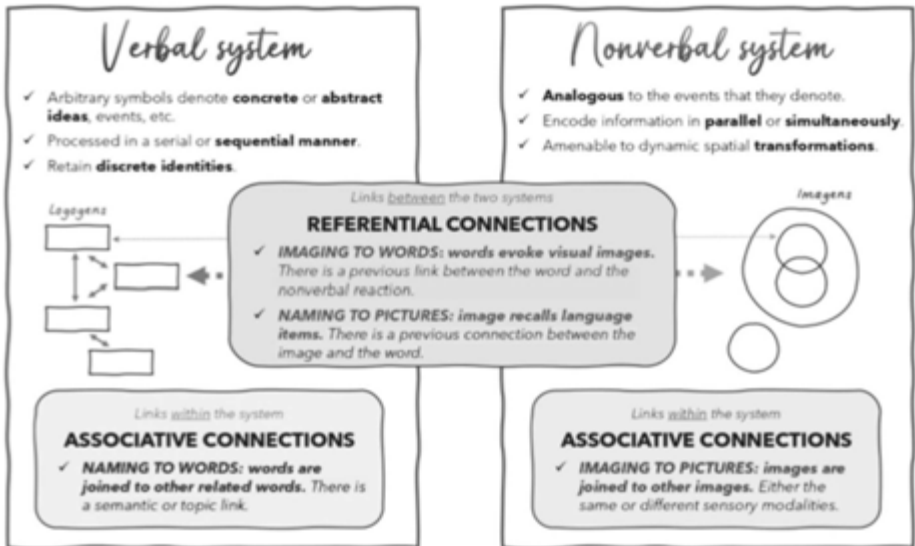
⁹ Visual-Imagery Strategy is addressed as VIS hereafter.

Going back to the example of the flower, our verbal system might evoke the word *flower* itself, or as stated before, other concrete or abstract concepts as well (*plant, petal, beautiful, delicate*, etc.). Similarly, we might generate ideas or conceptions such as «a flower is something beautiful, smells good, blossoms, or gives allergy,» for instance. On the other hand, our imagery might evoke mental pictures of what a flower *is* and *feels*, including its shape, smell, colors, or touch. Likewise, particular moments can arise in connection to a flower, such as picking up flowers or gifting a bouquet.

However, the most relevant part of the DCT for this paper rests in the *referential connections* between the verbal and non-verbal systems, which may occur in two forms: either a word evokes images, or an image recalls language items. In both cases, word and image must share a previous link or connection, for referential connections cannot occur without it. For connections between words and images to occur, the individual must have the background knowledge to connect image and word. In other words, our minds can only establish a referential association between the word ‘flower’ and its *imagery* if we can recall a context in which the connections were previously created, such as when learning about flowers at school or picking up flowers.

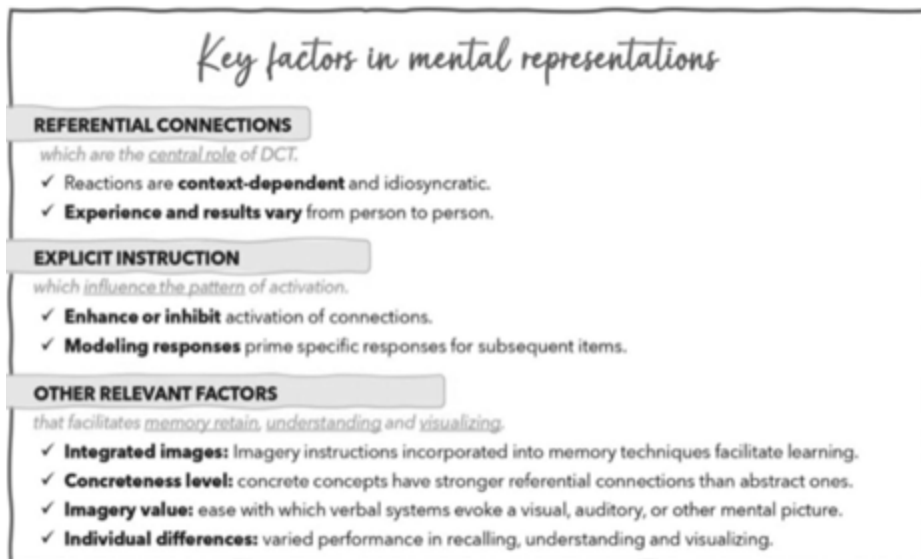
Figure 1

Scheme of verbal and non-verbal systems



Note. *Imagery and verbal mental representations*, Clark & Paivio, 1991, pp. 151-153. Own elaboration.

Figure 2
Key factors in mental representations



Note. *Processing assumptions of the Dual Coding Theory*, Clark & Paivio, 1991, pp. 153-156. Own elaboration.

3. METHODOLOGY

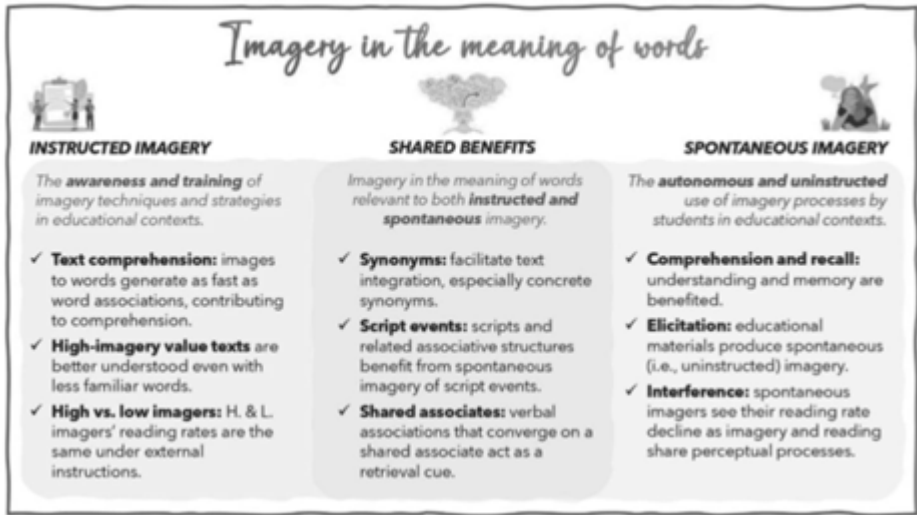
3.1 The application of the Visual-Imagery Strategy in FLL

When developing activities based on imagery, it is positive to assume that all students can use a VIS at different proficiency levels, but not so much that all students have the internal resources to carry it out successfully. Hence, the initial stages in the activities developed must seek to generate in students a verbal and imagery knowledge background from which to build language learning and recall, which ultimately enhances reading comprehension (Alley et al., 1984; Chan et al., 1990; Clark & Paivio, 1991; Divine-Hawkins & Levin, 1974; Kocaarslan, 2016; Nielsen Hibbing & Rankin-Erickson, 2003; Sukanya Devi & Sia, 2020).

In fact, explicit instruction is a crucial element in developing successful activities. Researchers have shown that direct instruction influences the word-image pattern of activation, allowing teachers to enhance or inhibit specific referential connections. As stated previously, Kosslyn's

experiments demonstrated that our minds consciously and subconsciously create mental pictures. By redirecting students' conscious and subconscious imagery with explicit instructions, we aim to model specific responses in students during the reading process, which is the essence of the VIS.

Figure 3
Imagery in the meaning of words



Note. *Imagery processes in the meaning of words and text*, Clark & Paivio, 1991, pp. 158-162. Own elaboration.

Thanks to the investigations of Alley et al. (1984) and Chan et al. (1990), we know that the amount of time and practice required to master the strategy requires extra teaching training and support for students, which leads to a second relevant aspect; the gradual withdrawal of external support. For students to use the VIS autonomously, it is necessary to encourage its independent application once understood.

Since most imagery training tends to be verbally directed (for example, when we ask students to generate mental images of what is happening in the story), we must plan its use carefully. Research has shown that the most beneficial way is to train visualization before reading and with the support of resources that promote the creation of spontaneous mental images, such as photographs.

The application of the VIS is beneficial in students with high and low reading performance. We know that the most successful readers apply the VIS spontaneously, thus improving their understanding and memory of events (Alley et al., 1984; Chan et al., 1990; Clark & Paivio, 1991; Nielsen Hibbing & Rankin-Erickson, 2003). In turn, they develop positive attitudes toward reading, produce more vivid images, and perform better on reading tasks (Kocaarslan, 2016).

More clues about why using a visual strategy is beneficial can be found in both high and low achievers. On the one hand, multiple researchers found that successful readers apply imagery spontaneously, which enhances their comprehension and memory of events (Alley et al., 1984; Chan et al., 1990; Clark & Paivio, 1991; Nielsen Hibbing & Rankin-Erickson, 2003). Students who are good at visualizing develop positive attitudes toward reading, produce more vivid imagery and perform better in reading assignments (Kocaarslan, 2016). We also know that students with difficulties cannot efficiently connect verbal and non-verbal languages. In the classroom reality, this translates into readers whose sole focus is decoding words, ignoring gaps in comprehension, and neglecting to use visualization and correction strategies. Therefore, explicit training in these strategies significantly changes their reading performance.

Regarding memory and recall, researchers found that using a VIS strengthens the relationship between words, images, and memory (Clark & Paivio, 1991). Using a VIS strengthens the relationship between words, images, and memory, multiplying the chances of an item being retrieved from long-term visual and verbal memory. By using SS-Movies and their written adaptation, the success in memorizing and remembering images and language can become more significant.

Figure 4
Imagery, comprehension, and recall in EFL

<i>Imagery, comprehension and recall in EFL</i>		
TEXT COMPREHENSION	VOCABULARY RECALL	KEY FACTORS IN RECALLING
<i>proven effects in text memory and comprehension</i>	<i>proven effects in vocabulary memory</i>	<i>general proven effects in learning through imagery</i>
<ul style="list-style-type: none"> ✓ The additive effect of imagery and verbal codes is better than a verbal code alone. ✓ Concrete phrases, sentences, and paragraphs are remembered better than abstract text. ✓ Texts activate preexisting semantic structures. But when previous knowledge is unavailable, comprehension builds around linguistic cues to identify importance and centrality. ✓ Spontaneous imagery reports better recall in subjects than those who do not. ✓ Imagery instructions report the best recall in subjects than those who do not. ✓ Internal images from life insights are central to models of effective reading and writing. 	<ul style="list-style-type: none"> ✓ Associative knowledge is the connection between verbal representations through referential links to nonverbal components. ✓ Associative relations are the primary source of meaning for abstract words. ✓ Indirect verbal associations contribute to retrieval: <ul style="list-style-type: none"> • a shared associate elicits multiple words or phrases. • a partial cue reactivates an entire representation (i.e., reintegration). • the keyword mnemonic technique allows linking new items with familiar keywords that sound alike. 	<ul style="list-style-type: none"> ✓ Generating images produces: <ul style="list-style-type: none"> • better recall than repeated encoding conditions. • better memory than translating or generating synonyms. ✓ Methods to a better recall: <ul style="list-style-type: none"> • Associative operations (e.g., outlining, summarizing, etc.). • Spatial methods to represent verbal relations (e.g., hierarchical trees, diagrams, etc.) ✓ The amount and recency of instruction make it more likely to respond with other terms on the list related to the stimulus word.

Note. *Memory, comprehension, and associative knowledge in learning of the Dual Coding Theory*, Clark & Paivio, 1991, pp. 158-173. Own elaboration.

Lastly, and despite all the benefits mentioned, there is evidence that the use of imagery while reading is a challenging task. Divine-Hawkins and Levin (1974) found that imagery instruction results better in listening than reading. Researchers point out that this is likely because the same cognitive areas drive reading and imagery. «When two tasks have the same code, interference between them is stronger because resources are derived from the same memory store for representation and processing.» (Sukanya Devi & Sia, 2020, p. 518). This is why VIS is recommended only under careful planning, sufficient learning time, and explicit instruction, three elements that have received special attention in the material design presented here.

4. DEVELOPMENT OF MATERIALS

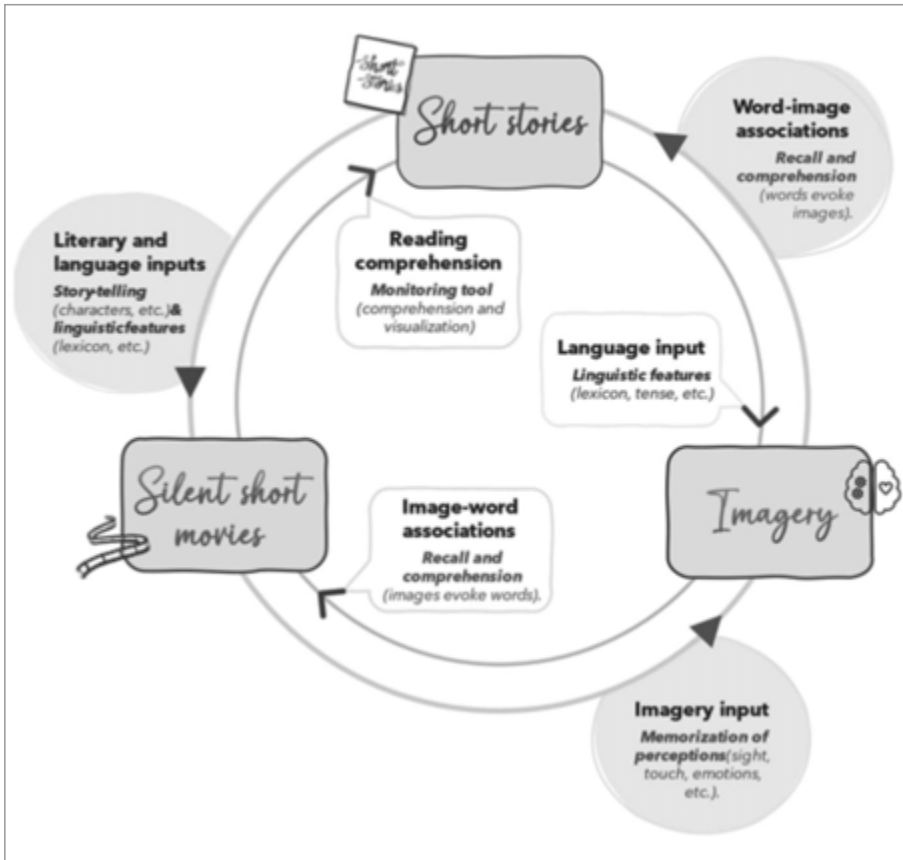
4.1 The integration of short stories, silent short movies, and imagery

Despite SS-Movies lacking language input and S-Stories motion imagery, both modes can be integrated into a teaching sequence where their par-

ticular characteristics promote and target students' use of *imagery*. By doing such, students see their reading comprehension, memory retention and recall, engagement with the text, and thinking skills enhanced (Alley et al., 1984; Clark & Paivio, 1991; Divine-Hawkins & Levin, 1974; Chan et al., 1990). A flowchart is included below for a more visual explanation of how these three elements are expected to interconnect.

Figure 5

The integration of short stories, silent short movies, and imagery



Integrating S-Stories stories and short films into a teaching sequence requires a holistic approach. Their benefits cover multiple fields, including sociolinguistic and cultural aspects, cognition, character building, and autonomous learning. For this reason, the didactic proposal must promote

various competencies integrated into a teaching-learning sequence that encompasses much more than mere linguistic notions. Deliberately reducing the weight of language in favor of a more holistic methodology helps to visualize the concept of language not as an objective but as a vehicle to engage in successful interactions with others.

Using SS-Movies responds to two fundamental purposes. The first is to obtain all the benefits of using short films mentioned above. The second is to generate a language gap through which to promote reading. When listening skills are set aside, the opportunity arises for a written version of the story to be introduced. Additionally, there is room for the creative use of language and the awareness of the metalinguistic keys of the scenes, which test students' critical thinking (Rinda Kartika et al., 2018, p. 2).

4.2 Adapting a short story from a silent short movie

The didactic proposal is structured around adapting a short film into a short story. The basis of this approach is to benefit from the combination of short films and S-Stories. Although most adaptations tend to be from book to film, the creation of a short story from a short film provides a series of specific benefits and peculiarities in FLL.

When teachers take control over the design of materials used, there is room for personalization and individualization of the teaching-learning process. This proposal visualizes teachers as potential authors of adapted S-Stories, encouraging them to create small literary pieces from those SS-Movies most significant to their classroom's reality and needs. Every teacher works in unique contexts where it is necessary to specifically work on daily life issues, perspectives, values, and traits relevant to their cultures, societies, and populations.

Teachers' management and production of different narrative styles, such as stories, fables, rhymes, or poems, promote their mastery of the foreign language and its continuous learning. In addition, elaborating own materials expands the availability of the story-movie catalog since it is not limited to the available film productions adapted from a short story. On the contrary, teachers create their literary pieces with the repertoire of all available films and short films created.

From this perspective, students gain key advantages by making the reading process meaningful, engaging, and more autonomous. Considering that students must know about 98% of the words in an authentic text to interact with it (Stein, 2012), adapted literature allows students to improve their comprehension, consolidate prior knowledge, and reduce frustration during reading practice. In the same way, it is easier to promote student autonomy with activities that avoid dependence on the teacher or require a more dominant role during the learning process (Pérez Ruiz & Santamaría Molinero, 2003).

However, despite the multiple benefits exposed, the reality is that adapting and preparing a short story is not an easy task nor one that all teachers can achieve. Lack of time, experience, or interest may make this method unsuitable for all FLT contexts. However, we can acknowledge that the artistic contribution of a single teacher in an educational center would be a generous contribution that would benefit an entire academic community for years.

The adapted short story provided in this article was created in 2021 as a final project for the subject *Short Stories* of the Master in Teaching English as a Foreign Language. Written and illustrated by me, it aims to capture the essence of the short film that inspired it, «Piper» (Allan Barillaro, 2016). Emotive and near to students' reality and problems, this SS-Movie provides the proper context for FLL through meaningful interactions where ethical values and critical thinking skills are cultivated.

The adaptation of the story was made considering the use of a wide range of vocabulary and expressions found in real-life situations and authentic literature. In this sense, the aim is not to adapt the story to students' level as EFL resources would but to make students cope with the text at the level they can reach. Hence, the story contains high-and low-frequency vocabulary items and expressions indistinctly.

Another relevant matter was elaborating a piece of writing that would allow curricular and cross-curricular links. On the one hand, the S-Story includes curricular elements that benefit EFL (rhymes, vocabulary, chunks, idioms, descriptions, structure of short stories, chronological events, re-adaptation of a narrative, other genres such as narrative, comic, theatre scripts, etc.). On

the other hand, the S-Story promotes the work of cross-curricular elements such as the coast life and its biodiversity, the habitat and feeding habits of sandpipers, storytelling through images and drawings, audiovisual materials, critical thinking skills, tolerance to frustration, and learning to learn.

The methodology is carried out in a reading-viewing sequence, i.e., students first handle the short story and finish with the short film. One of the reasons is that the short movie rewards students' effort in understanding and working on the reading. The film acts by solving comprehension problems, and the post-viewing activities guide students to verify the level of comprehension achieved of the story. Meanwhile, the reading part acts as a source of vocabulary and grammatical structures and facilitates the application of visualization strategies autonomously.

Lastly, the proposal includes other resources and materials that SS-Movies provide, such as the soundtrack and the teaser trailer. By utilizing them during the pre-reading activities, students become more involved and motivated with the reading process, making it easier to predict settings, characters, or events in the story. For instance, the different instruments and rhythms of the original soundtrack can encourage speculation about whether the plot includes adventures, moments of tension, happy events, etc. With this, we arouse students' interest and let their imagination play a part in the reading process, making reading more intriguing to discover whether their predictions and speculations agree with their previous ideas.

4.3 Criteria for the design of materials and the sequencing of the methodological proposal

This last section details the teaching-learning sequence where the three main elements are integrated with the rest of the materials used. Regarding the target student, this proposal has been developed specifically for the last years of primary school (fifth and sixth degrees), but the methodology could be adapted for older ones. It is important to know that from a cognitive development perspective, using visualization strategies is most effective from the age of eleven to twelve and onwards. Mastering words and images to represent their reality (Cherry, 2022) is vital for applying VIS, a strategy based on the cognitive ability to perceive and produce symbolic thought (Piaget, 1969).

Likewise, linking language and thought processes when moving from concrete objects to abstract ideas requires the ability to think in a logical and organized way, which is essential to deal with the facts and elements of a plot. Additionally, from this age, students begin to use inductive logic; a fundamental piece in developing thinking skills and making inferences and predictions about the plot.

Regarding the short film selected, *Piper* (2016) is a six-minute film that teaches a moral lesson about fear and the courage to overcome it. Written and directed by Allan Barillaro and produced by Pixar Animation Studios, it won the Academy Award for Best Animated Short Film in 2017. This SS-Movie tells the story of a baby sandpiper (a kind of shore bird) named Piper. Her mother encourages her to leave the nest and join the rest of the flock to hunt. However, when Piper tries and fails, she refuses to go near the seashore until she sees a curious group of hermit crabs.

This short film is accompanied by a delicate original soundtrack (OST) composed by Adrian Belew (2016) that flawlessly complements Piper's adventures and emotions, making it easier to guide students' imagery and plot predictions. In addition, a teaser trailer is available for free through the official YouTube account of Disney Studios LA. These resources help us feed students' imagination in activities that promote a more authentic use of the foreign language, such as conveying ideas, opinions, and predictions.

Finally, developing a printed guide with activities accompanying students during the learning process is essential. Thus, students can capture their learning process and check their milestones as the activities are carried out. In addition, the development of printed activities allows teachers to adapt the content and format of the material, adding indications about the completion of activities, challenges for more advanced students, bits of advice, examples, explanations, etc. Activities should be visually appealing, with a clear structure and organization that allows students to know what to do at each step in the process.

4.3.1 Pre-reading activities

Regarding the timing, the proposal is developed in activities to be carried out before, during, and after the reading. The pre-activities aim to capture

students' interest, introduce the target language, and feed their imagination through activities where associations between verbal and non-verbal languages are established. Although the most widely used resource is photography accompanied by the written word, we can avoid the over-exploitation of static images by manipulating objects (realia in English), thus favoring manipulative learning. Another key material is the soundtrack and the teaser trailer, which nourish students' imagination with sound and visual experiences.

Regarding motivation, different collaborative methodologies can be used, such as Aronson's Puzzle or the Think-Pair-Share strategy. These methods have proven effective in promoting engagement, collaboration, and autonomous learning, allowing students to interact more naturally and spontaneously in the target language through meetings and discussions in small groups or pairs, which ultimately demands a sense of responsibility during the learning process.

4.3.2 While-reading activities

The while-reading activities aim to introduce students to reading in a staggered and organized way, giving the necessary support at each step of the process. During these activities, assessing students' autonomous use of VIS while exploring the story, its illustrations, meaning, and language is crucial. It is worthwhile to start with a silent reading that guarantees students tackle the story at their own reading pace and within their comprehension needs. During this activity, the spontaneous and autonomous use of the VIS is encouraged, linking prior knowledge from previous activities with the reading process.

After that, the reading process can continue with group reading, the most suitable method for practicing pronunciation and intonation and becoming aware of linguistic characteristics such as rhythm and musicality. By directly guiding students, we can explicitly introduce the Visual-Imagery Strategy by modeling and structuring its application with verbal and visual aids. Likewise, we can model the use of repair strategies by doing comprehension checks about the plot.

This phase can conclude with methodologies such as storytelling, a fun and motivating activity that reinforces a positive vision of the reading process.

In addition, this methodology allows teachers to interact and communicate with students at eye level, avoiding distractions and improving visual and auditory conditions.

4.3.3 Post-reading activities

They aim to reward the students' effort in previous phases by viewing the short film and adapting the plot, thus promoting the understanding of the story and the production of language. On the one hand, watching the short film after reading acts as a comprehension tool and fosters a discussion environment with students to check their predictions and vision of the story. These interactions promote the oral production of the foreign language, making use of the target vocabulary.






From a cognitive point of view, the short film feeds and connects students' non-verbal representations to coincide with the verbal input received through the story, reinforcing the referential connections. In addition, employing thinking strategies such as «I used to think... / Now I think...» allow students to self-assess their reading comprehension level before and after watching the movie.

The proposal ends with students elaborating a written piece to facilitate free linguistic production, taking advantage of the short story's linguistic model. Thus, students find an authentic way to use new words and structures acquired during the previous stages. For this, it is essential not to expect students to naturally consider stories as language models and anticipate what to do autonomously. Instead, we can use the thinking strategy «We are learning to... / What I am looking for is...», which helps them visualize in a straightforward way how to plan the writing to meet the designed learning objectives.

4.4 Resources, materials, and students' handout of the proposal

Finally, all the resources designed or used for the methodological proposal are presented in this section. Each pre-, while- and after-reading stages have another two phases each, making it a total of six. The students' handout design has also been included in the table for each of the six phases.

Table 1
Resources and Materials. Pre-reading activities 1 and 2

RESOURCES AND MATERIALS: PRE-READING ACTIVITIES	
Pre-reading activities 1: Realia	
<p>RESOURCES:</p> <ul style="list-style-type: none"> • Realia: sand, water, crab shells, clams, small and big feathers, rocks, salt, seaweed, or any other item related to the setting and characters of the story. • Students' handout. • Dictionaries. <p>ACTIVITIES: necessary for activities 1, 2, and 3 of students' handouts.</p>	
<div style="border: 1px dashed gray; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">THE ARONSON'S PUZZLE</p>  <p><i>Remember that...</i></p> <ul style="list-style-type: none"> • You need to <i>interact and communicate</i> with others. • Each member is <i>responsible</i> for sharing the information from the Experts group. • Your <i>motivation, implication and effort</i> are important. So, try to do your best! 😊 </div> <div style="border: 1px dashed gray; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">HOW TO DISCUSS</p>  <p><i>Remember that...</i></p> <ul style="list-style-type: none"> • it is better to vote for a <i>secretary</i> to organize the speaking turns. • <i>Listening</i> is as important as speaking. Be patient and let your classmates talk. </div> <div style="border: 1px dashed gray; padding: 5px;"> <p style="text-align: center;">KEY INFORMATION</p> <p style="text-align: center;">ACTIVITY 3. </p> <p><i>Remember! Story elements:</i></p> <ul style="list-style-type: none">  The plot is what the story is about (<i>argumento</i>). The characters are the main roles of the story (<i>personajes</i>).  The setting is the time and place of the story (<i>escenario</i>). </div>	<div style="background-color: #f0f0f0; padding: 5px; margin-bottom: 10px;"> <p>ACTIVITY 1. Let's begin! You have 5 minutes to assign an expert role to each member of your group.</p> </div> <p>For example: María → Expert group 1</p> <hr/> <hr/> <hr/> <hr/> <div style="background-color: #f0f0f0; padding: 5px; margin-bottom: 10px;"> <p>ACTIVITY 2. Time to go! Gather with your EXPERTS group around the station. You have 10 minutes to:</p> </div> <p>a) Name each element in English. Use the dictionary if needed. [5 min]</p> <p>ELEMENT ONE: _____</p> <p>ELEMENT TWO: _____</p> <p>b) Guess their role in the story. Think about possible places and characters. [5 min]</p> <p>ELEMENT ONE: _____</p> <p>ELEMENT TWO: _____</p> <div style="background-color: #f0f0f0; padding: 5px; margin-bottom: 10px;"> <p>ACTIVITY 3. Time to come back! Gather with your PUZZLE group again. You have 20 minutes to complete these tasks:</p> </div> <p>a) What elements did you see? Explain what they were and write their names in English. [5 min]</p> <p>EXPERTS GROUP 1: _____</p> <p>EXPERTS GROUP 2: _____</p> <p>EXPERTS GROUP 3: _____</p> <p>EXPERTS GROUP 4: _____</p> <p>b) Share with the group what you discussed with the Experts group. Organize speaking turns and listen to each other's conclusions. [10 min]</p> <p>c) Then, create a final prediction about the story's elements. Think about possible settings, characters, problems and solutions. [5 min]</p> <p>FINAL PREDICTION: _____</p> <hr/> <hr/>

Pre-reading activities 2: Original Soundtrack (OST) and Teaser Trail

RESOURCES:

- Original Soundtrack of “Piper” (2016) by Adrian Belew:
 - Spotify: <https://open.spotify.com/track/0KY2c5ePxO3TgZLS0YXXJG?si=e04be29ae2734b17>
 - YouTube: <https://www.youtube.com/watch?v=DXfzYmsWQoQ>
- Tease Trailer of “Piper” (2016) by Pixar Animation Studios.
 - YouTube: <https://www.youtube.com/watch?v=z75UjqXqlh8>
- Students’ handout.

ACTIVITIES: necessary for activities 4, 5, and 6 of students’ handouts.

KEY INFORMATION
ACTIVITY 4.



Did you know...?

- Music is used to express emotions or events. Fast instruments express action & grim sounds fear 😱 and high-pitched sounds happiness 😊.
- Challenge extended! Can you guess what the story is about only with the music?

ACTIVITY 4. Let's listen! You are going to listen to the Original Soundtrack of “Piper” twice. Complete task A after the first listening, and task B after the second.

Task A) Choose 5 words from the list to describe the music. There's no right answer! Choose the words you think are best. [10 min]

Words:

1. Frolic (- happy)	6. Shore (- beach line)
2. To chill (- to scare)	7. To engulf (- to cover)
3. To bury (- hide in the ground)	8. To flit (- to fly)
4. Strange (- weird)	9. Adventurous (- brave)
5. Critter (- creature)	10. Rumble (- low sound)

Task B) Compare your ideas with a partner and write their words. Did you choose the same words? Why or why not? [15 min]

HOW TO DISCUSS



Remember that-

- Listening is as important as speaking. Be patient and let your classmates talk.
- To organize the discussion, you must raise your hand.

ACTIVITY 5. Let's gather! Discuss with the class and share your ideas. Write down important conclusions. We have 15 minutes!

KEY INFORMATION
ACTIVITY 6.

- Challenge completed? Did you guess what the story is about only with the music? Write your ideas!
- Remember! There's no right answer. Write what makes sense to you. 😊

ACTIVITY 6. Let's write! After discussing with the class, do your final prediction about the story plot. You have 10 minutes!

Table 2
Resources and Materials. While-reading activities 1 and 2

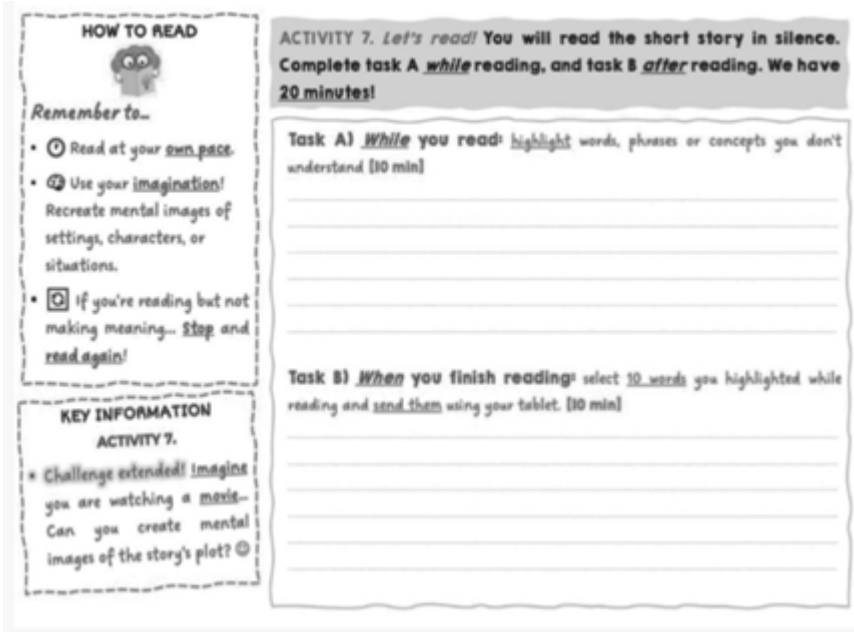
RESOURCES AND MATERIALS: WHILE-READING ACTIVITIES	
While-reading activities 1: Silent reading of the adapted S-Story	
RESOURCES:	
<ul style="list-style-type: none"> • Original Soundtrack of «Piper» (2016) by Adrian Belew. • Brainstorm live survey tool or website for schools (e.g., mentimeter). <ul style="list-style-type: none"> - Mentimeter app: https://www.mentimeter.com/app/ • Adapted S-Story <i>Piper</i> (Madrid Tribano, 2021). <ul style="list-style-type: none"> - Bookcreator: https://read.bookcreator.com/EovP04GRb7cSn5waUnNkR7Qc9Is1/L2wW6nE7R8upy5nxC-0mFQ • Students' handout. 	
ACTIVITIES: necessary for activity 7 of students' handout.	
	
While-reading activities 2: Group reading and storytelling of the adapted S-Story	
RESOURCES:	
<ul style="list-style-type: none"> • Original Soundtrack of «Piper» (2016) by Adrian Belew. • Adapted S-Story <i>Piper</i> (Madrid Tribano, 2021). • Students' handout. 	
ACTIVITIES: no activities are needed.	


Table 3

Resources and Materials. Post-reading activities 1 and 2

RESOURCES AND MATERIALS: POST-READING ACTIVITIES	
Post-reading activities 1: Watching the SS-Movie	
<p>RESOURCES:</p> <ul style="list-style-type: none"> • Silent Short Movie of «Piper» (2016) by Pixar Animation Studios. <ul style="list-style-type: none"> - Disney Plus+: https://www.disneyplus.com/es-es/movies/piper/3j2llXeKBRCu • Students' handout. <p>ACTIVITIES: necessary for activity 8 of students' handout.</p>	
Post-reading activities 2: Adapting the S-Story	
<p>RESOURCES:</p> <ul style="list-style-type: none"> • Students' handout. • Students' class notebooks. <p>ACTIVITIES: necessary for activities 9 and 10 of students' handout.</p>	

ACTIVITY 9. *Let's write!* Complete the different tasks before writing your story. You have 20 minutes!

HOW TO THINK



We're learning to...

What I'm looking for is...

- This strategy guides our **learning goal** and **results**.
- First, think about your **learning goal**: *What story did you choose?*
- Second, think about your **results**: *What do you need to include in your story?*

a) Choose one of these two options! [10 min]

Rewrite the story from a character's perspective:

- ✓ Write the same story but change the main character.
- ✓ Character ideas: the mother, the hermit crabs, the flock, etc.
- ✓ Change the perspective of the story: *who* is witnessing the story?

Adapt the script and create a theatre play:

- ✓ Write the same story but using dialogues.
- ✓ Think about the characters of your theater play.
- ✓ Change the time of the story: dialogues use present tenses!

b) Reflect about your **learning goals** and **results**: [10 min]

We're learning to...	What I'm looking for is...

ACTIVITY 10. *Let's write!* Write the story/script, thinking about your learning goals and results. You have 50 minutes!

KEY INFORMATION

ACTIVITY 10.

Plan your writing!

- Decide the most important elements of your story.

Use your own words!

- Don't use the dictionary too much.
- Use different words to say the same. Eg: bird = small animal that can fly.

a) **Plan your writing:** think about characters, settings, events, etc. [10 min]

b) **Use your notebook to write the story/script.** [40 min]

5. CONCLUSIONS

From a learning perspective, students generally perceive literacy as one of the most challenging skills to develop in their native and foreign languages. Unlike oral skills, reading and writing require explicit instruction on the elements and features to decode and encode texts. And although the learning process requires explicit teaching practice, its promotion requires the motivation and commitment of students to reading and writing, i.e., their autonomous participation in the literacy process.

The use of materials near to students' reality, such as short stories and short movies, attempts to make them visible, accessible, and motivating, hence strengthening the commitment of students to reading and other forms of narration. Additionally, we have seen how short movies and short stories facilitate curriculum integration and envision language learning as a vehicle for communication. Thus, the objectives of foreign language teaching are broadened to not only linguistic aspects but also cultural, emotional, and cognitive ones.

On the other hand, teaching visualization strategies manages to successfully model the reading process in students, thus providing them with techniques that improve their reading comprehension. Thanks to the application of the Dual Coding Theory for verbal and non-verbal languages, we can integrate various materials into our curricular designs that are committed to creating referential associations between the two, thus enhancing the memory and retention of our students.

Lastly, and as exposed in the proposal, the integration of short stories with short films through the Visualization Strategy allows for the inclusion of different learning styles, cooperative methodologies, autonomous learning, and thinking strategies. Additionally, the reading promotion cycle ends with the production of texts. Students move from decoding texts to encoding them, from understanding to developing them, and, ultimately, from being readers to become writers.

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ARTÍCULOS

Estudio de la práctica del método CEMA en Educación Primaria. Rúbrica de intervención

Study of the Practice of the CEMA Method in Primary Education. Intervention Rubric

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Resumen

Se evalúa un programa de formación para el aprendizaje y correcta aplicación del Método CEMA, mediante una rúbrica, en una muestra de sesenta docentes de Educación Primaria. Se estudió si existían diferencias estadísticamente significativas ($p < 0.05$) en las variables dependientes evaluadas. Veintisiete sujetos del grupo experimental obtuvieron mayores puntuaciones en la fase posttest. El 66,7 % del grupo experimental mejoró resultados con diferencias significativas en todas las variables. No hubo diferencias significativas en los resultados por asignaturas. La capacidad de escucha y el dominio de la materia que tenga cada docente, influye considerablemente en los resultados.

Palabras clave: evaluación de programas, método, rúbrica, intervención educativa, resultados de aprendizaje.

Abstract

A training programme for learning and correctly applying the CEMA method was assessed through a rubric in order to survey a sample of sixty Primary School teachers. It was analysed whether there were statistically significant differences ($p < 0.05$) in the dependent variables evaluated. Twenty-seven subjects from the experimental group obtained higher scores in the post-test phase. A 66.7% of the participants from the experimental group improved results with significant differences in all variables. There were no significant differences in the results by subject. The listening skills and subject mastery of each teacher have a considerable influence on the results.

Key Words: programme evaluation, CEMA Method, rubric, educational intervention, learning outcomes.

1. INTRODUCCIÓN

El método CEMA se presenta para el acto didáctico de la práctica docente a través de cuatro etapas, en un orden inalterable: **COMPRENDER**, **ENUNCIAR**, **MEMORIZAR** y **APLICAR** (Fernández Bravo, 2019; 2021b; 2022). En primer lugar, se actúa para que los alumnos¹ entiendan y comprendan aquello que están aprendiendo. Una vez comprendido, se enuncia con el vocabulario correcto cómo se llama (se representa, se dibuja, se simboliza, se escribe...) aquello a lo que los alumnos han dado sentido y significado. Posteriormente, se trabaja para que memoricen y guarden para el recuerdo a largo plazo, consiguiendo interiorización y mecanización de lo que han comprendido y de lo que se les ha enunciado. Finalmente, se prepara la aplicación, de aquello que han memorizado, a cualquier situación -desarrollando competencias, destrezas y habilidades- mediante la generalización y transferencia e interconexión del conocimiento, en la misma materia del saber, en otras distintas y en la vida real para su desarrollo personal.

Las etapas: «Comprender-Enunciar-Memorizar-Aplicar» (CEMA) son el proceso de un método de enseñanza antropológico-ontológico que describe los pasos, que debe ofrecer y respetar el que enseña, a realizar por el que aprende. Describe el procedimiento ordenado y sistemático para la adquisición del conocimiento. Se puede aplicar, como método de enseñanza, en los procesos de aprendizaje de cualquier materia del saber y ámbito académico, pero también a cualquier situación de la vida real que implique una situación de aprendizaje (Fernández Bravo, 2019; 2021b; 2022).

Siempre desde la doble perspectiva humanista y científica, la intención del método CEMA es el desarrollo integral de la persona, en todas sus dimensiones: intelectual, física, social, emocional, ética, estética y espiritual (Fernández Bravo, 2019).

Comprender es dar sentido propio al correcto significado. Exige la utilización de recursos, la experimentación real y simulada, la manipulación de

¹ Utilizamos en el uso del plural, sin discriminación de género, el masculino gramatical que incluye tanto alumnas como alumnos.

materiales, la visualización de procesos a través de cualquier herramienta, y el constante diálogo que permite hablar y escuchar. «El que aprende utiliza su propio lenguaje para comunicar, identificar y representar» (Fernández Bravo, 2019; 2021b). En esta etapa se reta y se desafía; se le presentan al estudiante situaciones problemáticas que son estimulantes del pensamiento reflexivo (Broudy, 1992, p. 136). Se podría hacer uso: de materiales manipulativos, tecnología, del aprendizaje basado en proyectos (ABP), el aprendizaje basado en problemas (Fernández Bravo y Barbarán, 2017), el método científico, el debate, el aprendizaje cooperativo, el método heurístico, el aprendizaje basado en retos y problemas (Berlanger y Gilbert, 2018), la gamificación, el aprendizaje dialógico, rutinas de pensamiento (Perkins et al., 1998; Rirchhart, Church y Morrison, 2014), el método socrático, etc.

El «arte de preguntar» como herramienta didáctica o, lo que es lo mismo: la importancia de la comunicación a través de una adecuada formulación de preguntas, es fundamental en esta etapa para partir siempre de las ideas del que aprende. Todo ser humano posee un cúmulo de pensamientos, dependiendo del nivel cultural que tenga y el medio ambiente en el que se desenvuelva, pues el hombre, como ser social por naturaleza, se relaciona con los demás, se comunica en forma oral, escrita y no verbal, tiene ideas, razona, reflexiona, conoce, aprende, sabe cómo percibir lo que necesita, siente y desea. (Jara, 2012)

La acción más importante de esta etapa es desarrollar el pensamiento. «Según la lógica formal la estructura del pensamiento está compuesta de la siguiente manera: concepto, juicio, razonamiento y demostración» (Izquierdo, 2006, pp. 21-23).

Enunciar, informar con precisión, rigor y claridad, del nombre, representación, simbología... Necesariamente *después, y solo después, de que se haya comprendido*: ¿son las palabras «delta», «meseta», «apotema», «mitocondria», ... o formalizaciones como $[(n(n-3))/2]$, el punto de partida o el punto de llegada? Para la epistemología del conocimiento, la respuesta correcta es: *siempre el punto de llegada*.

En el ámbito académico, es necesario entender lo mismo con las mismas representaciones, símbolos y expresiones «¿Por qué atribuimos diferentes significados a las mismas palabras?» (Brown, 2017).

La colaboración diádica de los primeros humanos se amplió hasta las prácticas culturales de los humanos modernos, incluidas las que constituyen los símbolos y construcciones convencionales (en algunos casos situaciones simbolizadas como proposiciones) de la comunidad lingüística local, a las que debe ajustarse todo aquel que quiera ser uno de *nosotros*. (Tomasello, 2016)

Memorizar-retener-reproducir. Es la tercera etapa; guardar en el recuerdo cómo se nombra, se identifica y representa (Enunciar), lo que ya se sabe qué es (Comprender). Son técnicas, procedimientos y herramientas posibles en esta etapa: los clásicos ejercicios, canciones, novelas (Moreno-Guerrero et al., 2020), experiencias reales, desing thinking (DT), programas informáticos (TIC) y medios audiovisuales, gamificación, dramatización, guiñol, aprendizaje cooperativo (Berta y Hoffmann, 2020), juego de roles, etc.

Aplicar los conocimientos aprendidos a multitud de experiencias, reconociéndolos en otras situaciones e incorporándolos en nuevos contenidos, para fortalecer el aprendizaje y adquirir el saber. En esta etapa se pone de manifiesto la relevancia y validez de lo que se ha aprendido, desarrollando el nivel competencial del estudiante; paso final para reconocer, acoplar y transferir a otras: situaciones, contextos, ambientes, escenarios y condiciones; *siempre a partir de sus propias decisiones*. En esta etapa se podrían utilizar técnicas como: programas informáticos, el aprendizaje-servicio, el aprendizaje basado en el pensamiento (Thinking Based Learning), el basado en competencias, el globalizado, Scape Room, el aprendizaje basado en proyectos, etc.

El concepto de estructuras del pensamiento, el modelo de aprendizaje de una estructura a través de la adquisición, internalización y transferencia, y los principios fundamentales... son estructuras del pensamiento, estructuras que pueden organizar y catalizar nuestro pensamiento en la enseñanza del pensamiento. (Perkins, 1986, p. 10)

Las etapas «Comprender-Enunciar-Memorizar» dan sentido a lo que se entiende por APRENDER. Pero eso solo no es suficiente, hay que pasar del «aprender» al SABER, y esto se consigue con la etapa «Aplicar», en la que se desarrollan habilidades, destrezas y competencias que contribuyen a «saber hacer» y transferir lo conocido mediante un aprendizaje inteligente.

El método CEMA favorece la igualdad de oportunidades y la equidad, reconociendo la atención a la diversidad desde una diversidad de atenciones. Busca resultados de un saber cuya intención es el desarrollo integral de la persona. No puede seguir trascendiendo la obsoleta diferenciación social entre «los de ciencias» y «los de letras». El pensamiento es UNO; es función de la escuela unir los dos hemisferios cerebrales y no separarlos. Los gustos determinarán la selección de caminos: unos llegarán al saber a través de las ciencias; otros, a través de las letras; y, otros, a través de ambas.

Las etapas de *Enunciación* y *Memorización* son habituales en los procesos de enseñanza-aprendizaje. El libro de texto es un claro ejemplo de ellas, como lo es la acción habitual registrada como clásica, del que enseña hacia el que aprende. La memoria es una facultad superior de la inteligencia. «¿La memoria no resuelve al menos el problema de la continuidad en el tiempo?» (Turner, 2009). En la enseñanza, para las etapas de *Comprensión* y *Aplicación* las personas **serán insustituibles**, ya sea desde una modalidad a distancia, *online*, presencial, semipresencial o con la información y los medios que hoy tenemos. Cualquier persona, más o menos preparada, podrá aproximarse a las etapas de *Enunciación* y *Memorización*. Sin embargo, será necesario recurrir a un docente vocacional, profesional y formado para abordar con éxito las etapas de *Comprensión* y *Aplicación*. Son etapas que, por su entramado académico, pedagógico y educativo, requieren de una buena formación y un claro entendimiento. La etapa más difícil de preparar para el que enseña es la etapa de *Comprensión* y, sin embargo, debe ser la que más fácil le resulte al que aprende.

En el desarrollo de la intervención educativa, el orden de presentación de las etapas para el que aprende es inalterable: Comprender-Enunciar-Memorizar-Aplicar. Sin embargo, conviene distinguir lo que «se presenta» del cómo «se prepara» y, desde el diseño educativo, cuando el que enseñe se disponga -a priori- a preparar la clase, plantear estrategias, proponer actividades, acomodar recursos y organizar contenidos. El orden que deberá respetar para esa elaboración será: Enunciar-Memorizar-Aplicar-Comprender. Esto significa que, para la preparación, se empezará por: conocer el significado del concepto que se enuncie y las distintas expresiones con las que se identifica de forma lingüística, académica, científica o cultural, con ejemplos claros de diversas situaciones que ayuden a la gene-

realización; después, se buscarán procedimientos, ejercicios y actividades para proponer al que aprende en la etapa de Memorización; para decidir, posteriormente, actividades que se puedan ofrecer en la etapa de Aplicación; por último, se buscará todo aquello que permita desarrollar con el que aprende la etapa de Comprensión.

Los materiales y recursos que existen a disposición de la enseñanza, ya conocidos o desconocidos, y los que no existen –porque surgirán en el futuro– tendrán que pasar por un proceso de selección en función de la etapa en la que se esté trabajando. Así, por ejemplo, no se podrá utilizar en la etapa de Comprensión ningún material o recurso que incorpore vocabulario específico sobre lo que se está trabajando. Ese vocabulario se utilizará necesariamente en la etapa de Enunciación, después -y solo después- de que se haya comprendido. El uso de materiales es más que necesario, pero para que sea fructífero hay que conocer con claridad lo que se quiere obtener con su utilización.

2. PLANTEAMIENTO DEL PROBLEMA

Conocer las fortalezas y debilidades de un programa de formación del método CEMA para la preparación de docentes en la práctica del desarrollo de sus clases -como intervención educativa-, y utilizar esos datos para mejorar la formación del profesorado en el método (Rubio Hernández y Olivo Franco, 2020).

La elaboración de un programa de formación, además del contenido teórico y práctico específico, requiere tener en cuenta aquellas acciones que presentan mayor dificultad para el que enseña (Jacobs, Martín y Otieno 2008; Via, 2016). Por distintos motivos, existen procedimientos didácticos, principios metodológicos o criterios educativos que el profesorado encuentra más difícil o costoso poner en práctica, por lo que -para aquellas personas que quisieran formarse en el método- habría que dedicar a estos procedimientos, principios y criterios más tiempo, y aumentar la cantidad y diversidad de actividades para su adquisición e interiorización (Escorza, 2018). Habitualmente «les enseñamos (los docentes) a responder (estudiantes). Les conducimos por el camino que nosotros (docentes) escogemos hacia el resultado que nosotros buscamos, sin ocuparnos de averiguar qué solucio-

nes propias aportan los alumnos a los problemas que les planteamos y los motivos o criterios que los llevan a tal forma de pensar y de actuar» (Fernández Bravo, 2021a); y esto tiene que cambiar.

Del mismo modo, existen otros procedimientos adecuados ya adquiridos e interiorizados por el profesorado que no presentan dificultad alguna, por lo que a estos habría que dedicar menos tiempo y presentarlos al principio como impacto motivador en la formación (De Miguel, 1998).

El conocimiento de estas debilidades y fortalezas nos ayudará a mejorar y establecer prioridades en los programas de formación del profesorado para la aplicación del método CEMA.

Los datos se obtienen de una rúbrica validada para la intervención educativa del método CEMA (Fernández Bravo, 2019), con una buena consistencia interna; nivel de fiabilidad (*alpha* de Cronbach) de 0,88. Se aplicó también el estadístico kappa de Cohen con un valor aceptable (Stoddart et al., 2000) entre 0,64 y 0,82, mostrando estos datos un nivel suficiente de consenso. Esta rúbrica, que se detalla más adelante, permite: promover una enseñanza de mayor calidad; mejorar la autoevaluación de maestras y maestros; centrarse en los procedimientos adecuados para la aplicación del método; proporcionar mejor retroalimentación; y, mejorar la práctica docente (Cothran, 2003; Rodríguez-Gallego, 2018).

El problema de nuestra investigación es evaluar el Programa de Formación del Método CEMA, con el fin de diseñar y desarrollar posteriormente un Programa de formación que permita al profesorado de Educación Primaria la consecución «aceptable» del contenido de la rúbrica y alcanzar -con sus alumnos- los resultados de aprendizaje de cada etapa, manteniendo o modificando en el Programa actual los procedimientos necesarios.

3. FUNDAMENTACIÓN TEÓRICA

3.1 Etapa de comprensión

COMPRENDER. Elaborar, generar ideas y conquistar el significado. La persona que enseña guía el aprendizaje de un nuevo concepto, procedimiento o estrategia a través de juegos-actividades-materiales-recursos-

con preguntas, ejemplos y contraejemplos, *partiendo siempre del pensamiento y del lenguaje del que aprende*. Cada uno de los alumnos toma decisiones propias y, **con su hacer**, trata de dar respuesta a lo que el docente le plantea: desde lo que sabe, sus conocimientos y experiencias previas, sus propias ideas y su propio lenguaje; **para comprender**. Esta etapa termina cuando el sujeto que aprende (alumna o alumno) alcanza el sentido y significado correcto de lo que está aprendiendo. En esta etapa no se permite utilizar el lenguaje específico de la materia de estudio, pues lo que se busca es la propia expresión de la idea correcta, y no, la correcta expresión de la idea.

3.1.1 Resultados de aprendizaje - comprender

Los resultados de aprendizaje son las acciones que se espera sea capaz de realizar el estudiante.

Para Adam (2004) «el establecimiento de los Resultados de Aprendizaje no sólo proporciona un modelo facilitador para la constatación y medición de los desempeños de los estudiantes, sino que también se concibe que éstos constituyen uno de los componentes principales para los sistemas de educación superior y calificaciones transparentes».

De los resultados de aprendizaje en la *Etapa de Comprensión*, se espera que *el alumnado comprenda el significado* del concepto trabajado; se presentan a continuación (Fernández Bravo, 2019):

- a. Interviene voluntariamente, respondiendo a preguntas.
- b. Expresa libremente a partir de su vocabulario, gestos, etc., sus propias ideas sobre lo que está oyendo, observando, ...
- c. Argumenta sus respuestas.
- d. Formula preguntas y/o pone ejemplos propios para refutar o aceptar lo que está aprendiendo y aclarar sus ideas.
- e. Es capaz de autocorregirse.
- f. Expresa ideas propias que dan sentido al significado correcto del concepto, tanto en situaciones iguales como diferentes a las utilizadas en el proceso.

- g. Entiende las ideas de otros alumnos y decide correctamente si se corresponden, o no, con el significado del concepto.

3.1.2 Rúbrica de intervención - comprender

Una rúbrica tal como indica de la Cruz (2011), es una herramienta que permite especificar de manera anticipada los aspectos que integran una actividad, un producto. La rúbrica ofrece información objetiva y significativa, puesto que en ella el docente encuentra reflejados los diferentes niveles de profundización o grados de calidad de las dimensiones establecidas (Chica, 2011; Andrade, 2005).

La validación de la rúbrica se realizó mediante el juicio de expertos. La evaluación mediante el juicio de expertos nos permite comprobar si el instrumento cumple con los criterios de validez y fiabilidad que son requeridos para su correcta utilización. Teniendo en cuenta lo que indican Robles y Rojas (2015), hay que conocer, el grado en que el instrumento mide aquello que realmente pretende medir y si sirve para el propósito para el que ha sido construido.

La Rúbrica es dicotómica con dos valores (SÍ – NO). Afirmación, negación. Cada ítem de la rúbrica se evalúa por tres (3) expertos, de tal forma que ninguno de ellos conoce la decisión de los otros. La persona evaluada puede ser observada en tiempo real, a través de una/varias grabación/es, y/o entrevistas a partir de programaciones o unidades didácticas. Cada uno de los evaluadores, en cada ítem, puede puntuar: SÍ; NO; o, ausencia de marca (\emptyset); El evaluador –a su juicio– no puede tomar decisión por SÍ o NO). Por cada SÍ, se obtienen dos puntos; por cada (\emptyset), se obtiene 1 punto; y, por cada NO, se obtienen 0 puntos. La siguiente tabla es indicadora de las categorías de cada ítem de la rúbrica.

Tabla 1
Posibles situaciones de registro de rúbrica

ÍTEM	EVALUADOR 1	EVALUADOR 2	EVALUADOR 3	CATEGORÍAS	PUNTUACIÓN
X1	SÍ	SÍ	SÍ	CONSEGUIDO	6
X1	SÍ	SÍ	∅	PREPARADO	5
X1	SÍ	SÍ	NO	INICIADO	4
X1	SÍ	∅	∅	ADHERIDO	4
X1	SÍ	∅	NO		3
X	∅	∅	∅		3
X1	∅	∅	NO		2
X1	∅	NO	NO		1
X1	NO	NO	NO		0

Un ítem se considera *aceptable* con una puntuación mayor o igual a 5 (en categorías «preparado» y «conseguido»). Cuando la media aritmética de las puntuaciones de los ítems de una ETAPA, es mayor o igual a 4,5 existe una correlación positiva y favorable para la consecución de los resultados de aprendizaje.

En esta etapa, la misión del que enseña es conocer el significado del concepto que se estudie para encontrar los procedimientos adecuados que faciliten al que aprende: entendimiento y comprensión; y, conseguir que los alumnos logren los resultados de aprendizaje de esta etapa (Fernández Bravo, 2019).

Tabla 2
Rúbrica intervención. Etapa *COMPRESIÓN*

RÚBRICA ETAPA DE COMPRESIÓN PREGUNTAS PARA LA INTERVENCIÓN DE LA ENSEÑANZA		
C1	¿Se tienen en cuenta los contenidos previos que se necesitan para la comprensión del concepto?	
C2	¿La actividad diseñada para iniciarse en la comprensión del tema, concepto, etc., permite la participación de todos los alumnos que poseen los contenidos previos?	
C3	¿La actividad diseñada para iniciarse en la comprensión del tema, concepto, etc., motiva a sus alumnos para la participación por decisión propia?	

C4	¿Plantea actividades, distintas de la inicial y derivadas de esta, que motiven y desafíen intelectualmente para provocar en los alumnos la expresión de ideas propias, con relación a la comprensión del concepto que se desea enseñar? (¿Favorece en sus alumnos la utilización de: pensamiento, autonomía, observación y crítica?).	
C5	¿Utiliza distintos materiales y recursos para favorecer la investigación, la indagación y el descubrimiento?	
C6	¿Utiliza la formulación de preguntas en la intervención educativa para dirigir el pensamiento del alumnado?	
C7	¿Tiene en cuenta la respuesta del alumnado para continuar, desde esta, la conversación que se establece profesor/a – alumno/a? (¿Utiliza el vocabulario de los alumnos en el diálogo que establece con ellos?).	
C8	¿Favorece la discusión y el debate, y permite que hablen todos los que quieren hacerlo?	
C9	¿Respeta el tiempo necesario para que los alumnos se expresen/actúen?	
C10	¿Presenta actividades de menor a mayor dificultad?	
C11	¿Utiliza conceptos que el alumnado ya conoce para conquistar la comprensión del nuevo concepto en el que está trabajando?	
C12	¿Modifica las actividades planteadas según las respuestas de sus alumnos, adaptándolas a las necesidades de aprendizaje?	
C13	¿Utiliza ejemplos y contraejemplos que permitan a sus alumnos, mediante la autocorrección?: ¿el afianzamiento de una idea buena, el rechazo de una idea incorrecta o la eliminación de la duda? (¿Conduce a sus alumnos, mediante ejemplos y contraejemplos, a ser conscientes de su acierto o error por decisión propia?).	
C14	¿Evita la corrección (con palabras como bien, mal o similares, y gestos o utilización de un lenguaje no verbal), sin imponer su pensamiento y/o procedimiento?	
C15	¿Evita su lenguaje, en la conversación con sus alumnos, y la nomenclatura / vocabulario / simbología científica / representación ... del concepto mientras se está conquistando su comprensión? (Evitar convencionalismos y partir del lenguaje de los alumnos).	
C16	¿La didáctica que utiliza trabaja con todas las posibles variantes que -en cada caso y según la edad- se necesitan en la comprensión del concepto para su correcta adquisición?	
C17	¿Comprueba que sus alumnos han adquirido el significado del concepto expresando ideas correctas con su propio vocabulario, en situaciones diferentes a las que se han presentado hasta ahora? (¿Comprueba que sus alumnos han comprendido el concepto?).	
C18	¿Consigue que lleguen, a la comprensión del concepto, todos los alumnos que tenían los contenidos previos necesarios?	

Nota. Tomado de *La sonrisa del conocimiento*, por J. A. Fernández Bravo, 2019.

3.2 Etapa de enunciación

ENUNCIAR. Es función del lenguaje. El docente enuncia con verdad, claridad y rigor la expresión convencional de lo que los alumnos ya han comprendido. Expresión verbal, científica o cultural, de las ideas generadas: nomenclatura, representación, simbología, etc. Esta etapa empieza -necesariamente- cuando termina la anterior. El principal objetivo de esta etapa es que el sujeto que aprende (alumna o alumno) conozca la correcta expresión (oral y escrita) de la idea que ya ha comprendido. El estudiante asocia correctamente «lo que es con el cómo se expresa». Esto no puede ser descubierto por el estudiante, ya que el nombre, la simbología...; en definitiva, «cómo se expresa» pertenece al lenguaje convencional, por lo que tendrá que ser transmitido por el que enseña.

3.2.1 Resultados de aprendizaje - enunciar

De los resultados de aprendizaje en la *Etapa de Enunciación*, se espera que *el alumnado conozca la verbalización del nombre y la representación de la simbología del concepto objeto de estudio*; se presentan a continuación (Fernández Bravo, 2019):

- a. Verbaliza correctamente de forma oral la terminología convencional enunciada.
- b. Expresa correctamente de forma escrita la terminología convencional enunciada.
- c. Representa o simboliza correctamente la terminología convencional enunciada. (Si el concepto requiere símbolo o representación).
- d. Asocia correctamente: terminología y significado.
- e. Entiende y/o expresa frases con sentido, en las que se incluye la terminología enunciada con su correcto significado.
- f. Detecta, si los hubiera, errores de terminología y significado.

3.2.2 Rúbrica de intervención – enunciar

En esta etapa (Fernández Bravo, 2019), *la misión del que enseña es poner a disposición del que aprende los convencionalismos. Conocer, enunciar y*

transmitir las distintas expresiones con las que se identifica de forma lingüística, académica, científica o cultural, con ejemplos claros de diversas situaciones que ayuden a la generalización; asociando correctamente el significado con su expresión; y, conseguir que los alumnos logren los resultados de aprendizaje de esta etapa.

Tabla 3
Rúbrica intervención. Etapa ENUNCIACIÓN

RÚBRICA ETAPA DE ENUNCIACIÓN PREGUNTAS PARA LA INTERVENCIÓN DE LA ENSEÑANZA		
E1	Antes de enunciar con la terminología convencional, asociando esta a la/s expresión/es utilizada/s por sus alumnos, ¿utiliza al menos dos situaciones diferentes que hagan referencia al concepto que se ha comprendido, para que los alumnos lo reconozcan expresándose con sus palabras, a partir de las cuales el docente enunciará «vocabulario, expresión, fórmula, simbología...» convencional admitido universalmente por la materia de estudio?	
E2	¿Enuncia a los alumnos la terminología convencional del concepto (nomenclatura, simbología, etc.) después de que estos lo hayan comprendido?	

Nota. Tomado de *La sonrisa del conocimiento*, por J. A. Fernández Bravo, 2019.

3.3 Etapa de memorización

MEMORIZAR. Recordar a corto y largo plazo «cómo se llama lo que ya se sabe qué es»; concreción. Una vez que se han conseguido las dos etapas anteriores, el estudiante a través de actividades propuestas por la maestra o el maestro, aplica a situaciones conocidas y ligadas a su experiencia, el contenido comprendido con la correcta expresión convencional. La función de esta etapa es memorizar la correcta asociación entre expresión y significado para recordar «lo que es y cómo se expresa».

3.3.1 Resultados de aprendizaje - memorizar

De los resultados de aprendizaje en la *Etapa de Memorización*, se espera que *el alumnado memorice el significado del concepto, la verbalización del nombre y la representación de la simbología, las identifique correctamente y las asocie con sentido al significado del concepto; se presentan a continuación (Fernández Bravo, 2019):*

- a. Recuerda la terminología del concepto y la asocia correctamente a su significado.
- b. Reproduce/reconoce el vocabulario, la simbología, expresión... oralmente, asociando correctamente la terminología empleada a su significado.
- c. Reproduce/reconoce el vocabulario, la simbología, expresión... por escrito, asociando correctamente la terminología empleada a su significado.
- d. Realiza correctamente actividades y ejercicios en los que interviene el concepto, identificándolo con su terminología.
- e. Explica el significado del concepto aprendido, utilizando ejemplos propios.
- f. Es capaz de: crear, o construir, o reconstruir, o modificar o inventar, actividades y ejercicios en los que intervenga el concepto aprendido, con su correcta terminología y significado.
- g. Detecta, si los hubiera, errores de terminología y significado.

3.3.2 Rúbrica de intervención - memorizar

En esta etapa (Fernández Bravo, 2019), la misión del que enseña es *encontrar los procedimientos adecuados para facilitar al que aprende el recuerdo, acordándose de ello y logrando traerlo al presente; y, conseguir que los alumnos logren los resultados de aprendizaje de esta etapa.*

Tabla 4
Rúbrica intervención. Etapa MEMORIZACIÓN

RÚBRICA ETAPA DE MEMORIZACIÓN PREGUNTAS PARA LA INTERVENCIÓN DE LA ENSEÑANZA		
M1	¿Plantea actividades que favorecen la memorización de la audición y dición de la terminología convencional enunciada?	
M2	¿Plantea actividades que favorecen la memorización de la escritura de la terminología convencional enunciada?	
M3	¿Plantea actividades que favorecen la memorización de la representación y/o simbolización de la terminología convencional enunciada? (Si el concepto requiere símbolo o representación)	
M4	¿Plantea actividades (cantidad, diversidad-variabilidad) que favorecen la memorización para asociar correctamente terminología y significado?	
M5	¿Plantea actividades que favorecen la memorización de la correcta asociación entre terminología y significado por su relación con las inquietudes e intereses de sus alumnos (juegos, canciones, películas, excursiones, visitas...)?	
M6	¿Plantea actividades que favorecen la memorización de la correcta asociación entre terminología y significado por su relación con otras materias de estudio y la vida real?	
M7	¿Ofrece una secuencia de actividades de menor a mayor dificultad?	
M8	¿Plantea ejercicios de una misma actividad con distintos niveles, permitiendo que los alumnos trabajen en lo mismo -sin hacer las mismas cosas- respetando el nivel de adquisición?	

Nota. Tomado de *La sonrisa del conocimiento*, por J. A. Fernández Bravo, 2019.

3.4 Etapa de aplicación

APLICAR. Es la última etapa del método y no se puede empezar si no se ha conseguido la anterior. Los alumnos, *por decisión propia*, a través de actividades propuestas por el adulto y/o encontradas en las experiencias que les presenta su vida, generalizan y aplican el conocimiento memorizado a situaciones distintas o que se diferencian en algo con las situaciones que se le hayan

presentado en las etapas anteriores, tanto para obtener nuevos conocimientos en la misma materia de estudio, en otras materias o en otras realidades e idealidades, para su desarrollo social, emocional, intelectual, físico, ético ...

3.4.1 Resultados de aprendizaje - aplicar

De los resultados de aprendizaje en la *Etapas de Aplicación*, se espera que *el alumnado transfiera e identifique lo aprendido en otras situaciones, y lo utilice POR DECISIÓN PROPIA para calcular, explicar, entender... nuevas situaciones, resolver otros problemas, comprender nuevos conceptos...*; se presentan a continuación (Fernández Bravo, 2019):

- a. Reconoce y/o aplica lo aprendido, por decisión propia, en situaciones relacionadas con la misma materia de estudio, para la realización de actividades y ejercicios -distintos a los trabajados-, en los que intervenga de alguna manera lo que ha aprendido.
- b. Reconoce y/o aplica lo aprendido, por decisión propia, en situaciones relacionadas con la misma materia de estudio, para el descubrimiento y la comprensión de nuevos conceptos.
- c. Reconoce y/o aplica lo aprendido, por decisión propia, en situaciones relacionadas con otras materias distintas a la materia de estudio.
- d. Reconoce y/o aplica lo aprendido, por decisión propia, en situaciones relacionadas con la vida real.
- e. Descubre otras formas distintas de hacer lo que ha aprendido.
- f. Aplica lo aprendido, sin que nadie se lo advierta, para crear, o inventar, o construir, o modificar... algo que él mismo decide o le proponen los demás.
- g. Comprueba, por sus propios medios, el acierto o error de diversos resultados, mediante la aplicación de lo aprendido.
- h. Descubre, por sus propios medios, el error de diversos resultados, mediante la aplicación de lo aprendido.

3.4.2 Rúbrica de intervención - aplicar

En esta etapa (Fernández Bravo, 2019), la misión del que enseña es *encontrar los procedimientos* adecuados para facilitar al que aprende: la trans-

ferencia, utilización y el empleo *-por decisión propia- de lo que ha aprendido; sobre el mismo u otro concepto relacionado con la materia de estudio, de otra materia o de la vida real; y, conseguir que los alumnos logren los resultados de aprendizaje de esta etapa.*

Tabla 5
Rúbrica intervención. Etapa APLICACIÓN

RÚBRICA ETAPA DE APLICACIÓN PREGUNTAS PARA LA INTERVENCIÓN DE LA ENSEÑANZA		
A1	¿Plantea actividades para que los alumnos puedan reconocer lo aprendido <i>-por decisión propia-</i> en situaciones distintas a aquellas en las que se ha generado el aprendizaje?	
A2	¿Utiliza recursos funcionales, significativos y motivadores, como cuentos, juegos, crucigramas, canciones, catálogos de centros comerciales, prospectos, recetas de cocina, etc., para favorecer la aplicación de lo aprendido?	
A3	¿Plantea actividades relacionadas con la vida real para que los alumnos puedan reconocer y transferir lo aprendido <i>-por decisión propia-?</i>	
A4	¿Plantea actividades, relacionadas con la misma materia de estudio, en las que los alumnos puedan aplicar lo aprendido para el descubrimiento y la comprensión de nuevos conceptos?	
A5	¿Plantea actividades, relacionadas con otras materias distintas a la materia de estudio, para que los alumnos puedan transferir y aplicar lo aprendido <i>-por decisión propia-?</i>	
A6	¿Plantea actividades en las que los alumnos sean los creadores de algo a partir de la aplicación de lo aprendido?	

Nota. Tomado de *La sonrisa del conocimiento*, por J. A. Fernández Bravo, 2019.

4. METODOLOGÍA

Se utilizó una muestra de sesenta docentes (60), con un diseño cuasiexperimental comparativo de un grupo (pretest-intervención-postest), sobre un total de veintiocho docentes (18 maestras y 10 maestros) que impartían Matemáticas, Lengua y Ciencias, en Educación Primaria. Este grupo de veintiocho personas (grupo experimental *-GE-*) fue elegido de la muestra por obtener *-en todos los ítems de la rúbrica-* menos de 3 puntos, en la fase

pretest; de este grupo: nueve (9) sujetos trabajaban con conceptos de Matemáticas; otros siete (7), con conceptos de Lengua; y, los otros doce (12) con conceptos de Ciencias.

Se planteó la siguiente hipótesis de estudio (nula): si se utiliza el *Programa de Formación del Método CEMA*, no existirán diferencias significativas (pretest-postest) en todos y cada uno de los ítems de la rúbrica. La hipótesis alternativa, si se utiliza el *Programa de Formación del Método CEMA* existirán diferencias significativas (pretest-postest) en todos y cada uno de los ítems de la rúbrica.

La variable independiente en esta investigación ha sido el *Programa de Formación del Método CEMA*. Las variables dependientes estudiadas fueron las competencias descritas en los ítems de la rúbrica.

La fase pretest tuvo lugar, con el total de la muestra, en los meses de abril-mayo-junio de 2018. La fase de intervención con el grupo experimental se llevó a cabo durante un periodo de siete meses dentro del curso escolar 2018-2019 y en ella se aplicó el *Programa de Formación del Método CEMA*. El seguimiento del programa se concluyó con 15 sesiones de dos horas de duración. El grupo experimental de veintiocho (28) profesores intervino en el aula con el Método CEMA de enero a abril de 2021, manteniéndose en las mismas asignaturas que en la fase pretest. La fase posttest se realizó en mayo-junio de 2021, con veintisiete (27) sujetos.

5. RESULTADOS

El análisis estadístico de los datos recogidos se realizó con *Statistical Package for the Social Sciences* (SPSS), versión 26.0. Siguiendo el diseño de investigaciones anteriores (Fernández Bravo et al., 2010) se estudió, mediante un análisis de varianza, si existían diferencias estadísticamente significativas ($p < 0.05$) en las variables dependientes evaluadas en la fase pretest. Con la finalidad de comparar los cambios producidos por la utilización del *Programa de Formación del Método CEMA*, se realizó un análisis de varianza múltiple en relación con todas las variables evaluadas. Se calculó el coeficiente de correlación múltiple y el coeficiente de determinación corregido o ajustado. La prueba de significación del coeficiente de

correlación se realizó considerando la hipótesis alternativa como bilateral (es decir, el coeficiente de correlación poblacional es distinto de cero). Para analizar las condiciones de aplicación de la regresión, se realizó un análisis de los residuos, observando la exigencia de normalidad de éstos.

Los 27 sujetos del grupo experimental (100 %) obtuvieron mayores puntuaciones en la fase postest.

En la siguiente tabla podemos ver, de cada variable, el tanto por ciento del grupo experimental que mejoraron los resultados con diferencias significativas postest-pretest (Sig. de F, $p < 0.005$). Así, por ejemplo, para la variable C1 «¿Se tienen en cuenta los contenidos previos que se necesitan para la comprensión del concepto?», el 92,6 % (25 sujetos) mejoraron los resultados con diferencias significativas.

Tabla 6
Porcentaje de mejora en los resultados con diferencias significativas postest-pretest de cada variable de la rúbrica. Resultados grupo experimental

Sig. de F ($p < 0.05$)											
C1	92,6 %	C7	92,6 %	C13	88,9 %	E1	100 %	M5	81,5 %	A3	70,4 %
C2	100 %	C8	100 %	C14	96,3 %	E2	100 %	M6	81,5 %	A4	88,9 %
C3	92,6 %	C9	70,4 %	C15	96,3 %	M1	96,3 %	M7	92,6 %	A5	70,4 %
C4	88,9 %	C10	92,6 %	C16	70,4 %	M2	96,3 %	M8	88,9 %	A6	88,9 %
C5	96,3 %	C11	92,6 %	C17	88,9 %	M3	96,3 %	A1	96,3 %		
C5	88,9 %	C12	92,6 %	C18	88,9 %	M4	88,9 %	A2	81,5 %		

Los resultados de la tabla anterior nos muestran que:

- El 100 % del profesorado del grupo experimental mejoró resultados con diferencias significativas en las variables: C2; C8; E1; E2.
- El 96,3 % del profesorado del grupo experimental mejoró resultados con diferencias significativas en las variables: C5; C14; C15; M1; M2; M3; A1.
- El 92,6 % del profesorado del grupo experimental mejoró resultados con diferencias significativas en las variables: C1; C3; C7; C10; C11; C12; M7.
- El 88,9 % del profesorado del grupo experimental mejoró resultados con diferencias significativas en las variables: C4, C6; C13, C17; C18; M4; M8; A4; A6.
- El 81,5 % del profesorado del grupo experimental mejoró resultados con diferencias significativas en las variables: M5; M6; A2.
- El 70,4 % del profesorado del grupo experimental mejoró resultados con diferencias significativas en las variables: C9; C16; A3, A5.

El 66,7 % del profesorado del grupo experimental mejoró resultados con diferencias significativas en todas las variables.

No hubo diferencias significativas de resultados por asignaturas.

Se rechaza la hipótesis de estudio (nula): *Si se utiliza el Programa de Formación del Método CEMA, no existirán diferencias significativas (pre-test-postest) en todos y cada uno de los ítems de la rúbrica, para el 66,7 % del profesorado del grupo experimental.*

- Se rechaza la hipótesis de estudio (nula) para el 100 % del profesorado del grupo experimental en las variables: C2; C8; E1; E2.
- Se rechaza la hipótesis de estudio (nula) para el 96,3 % del profesorado del grupo experimental en las variables: C5; C14; C15; M1; M2; M3; A1. Se acepta la hipótesis nula para el 3,7 % del profesorado del grupo experimental.
- Se rechaza la hipótesis de estudio (nula) para el 92,6 % del profesorado del grupo experimental en las variables: C1; C3; C7; C10; C11;

C12; M7. Se acepta la hipótesis nula para el 7,4 % del profesorado del grupo experimental.

- Se rechaza la hipótesis de estudio (nula) para el 88,9 % del profesorado del grupo experimental en las variables: C4, C6; C13, C17; C18; M4; M8; A4; A6. Se acepta la hipótesis nula para el 11,1 % del profesorado del grupo experimental.
- Se rechaza la hipótesis de estudio (nula) para el 81,5 % del profesorado del grupo experimental en las variables: M5; M6; A2. Se acepta la hipótesis nula para el 18,5 % del profesorado del grupo experimental.
- Se rechaza la hipótesis de estudio (nula) para el 70,4 % del profesorado del grupo experimental en las variables: C9; C16; A3, A5. Se acepta la hipótesis nula para el 29,6 % del profesorado del grupo experimental.

6. CONCLUSIONES

El *Programa de Formación del método CEMA*, para la preparación de docentes ofrece un avance importante en la práctica de sus clases -como intervención educativa-. Como mejora del *Programa de Formación* mantendremos las fortalezas que se presentan y revisaremos las debilidades, en función de los resultados obtenidos.

Para el estudio del *Programa de Formación* en acciones dirigidas al desarrollo de la *Etapa de Comprensión*, se consideran como fortalezas: que se tienen en cuenta los contenidos previos necesarios para la comprensión del concepto; es alta la probabilidad de que la actividad diseñada para iniciarse en la comprensión del tema, concepto, etc., permita la participación de todos los alumnos que poseen los contenidos previos y los motive a la participación; se plantean actividades, distintas de la inicial y derivadas de esta, que motivan y desafían intelectualmente para provocar en los alumnos la expresión de ideas propias; se utilizan distintos materiales y recursos para favorecer la investigación, la indagación y el descubrimiento, haciendo uso de la formulación de preguntas, ejemplos y contraejemplos, atendiendo a la respuesta del alumnado; se utilizan conceptos que conocen

los alumnos, se modifican las actividades en función de las necesidades de estos y se favorece la discusión y el debate, evitando la corrección del que enseña y favoreciendo la autocorrección del que aprende; los docentes son conscientes de la necesidad de comprobar que sus alumnos han adquirido el significado del concepto expresando ideas correctas con su propio vocabulario, en situaciones diferentes a las presentadas, para seguir trabajando o dar por terminada la comprensión.

En la Etapa de Comprensión, se revisará el Programa de Formación para: aumentar la probabilidad de que el profesorado trabaje con todas las posibles variantes que -en cada caso y según la edad- se necesitan en la comprensión del concepto; y, respete el tiempo necesario para que los alumnos se expresen/actúen.

Para el estudio del *Programa de Formación* en acciones dirigidas al desarrollo de la *Etapa de Enunciación*, se valoran como fortalezas: que el profesorado del grupo experimental enuncia a los alumnos la terminología convencional del concepto (nomenclatura, simbología, etc.) después de que estos lo hayan comprendido; y, antes de enunciar con la terminología convencional, utilizan al menos dos situaciones diferentes que hagan referencia al concepto que se ha comprendido. Se mantendrán en el *Programa de Formación del Método CEMA*, las actividades dirigidas al desarrollo de esta etapa por no encontrar debilidad alguna.

Para el estudio del *Programa de Formación* en acciones dirigidas al desarrollo de la *Etapa de Memorización*, se consideran como fortalezas que las actividades planteadas: favorecen la memorización para asociar correctamente terminología y significado, teniendo en cuenta la dicción, audición, escritura y representación o simbología; se presentan en cantidad suficiente de menor a mayor dificultad; atienden a la diversidad con un diseño universal de aprendizaje; y, están relacionadas fundamentalmente con situaciones de la materia de estudio.

En la Etapa de Memorización se revisará el Programa de Formación para: aumentar la probabilidad de que el profesorado plantee actividades que favorezcan la memorización de la correcta asociación entre terminología y significado por: su relación con las inquietudes e intereses de sus alumnos; otras materias de estudio; y, la vida real.

Para el estudio del *Programa de Formación* en acciones dirigidas al desarrollo de la *Etapa de Aplicación*, se consideran como fortalezas que el profesorado del grupo experimental plantea actividades en las que los alumnos pueden reconocer lo aprendido -por decisión propia-, en situaciones distintas a aquellas en las que se ha generado el aprendizaje, para el descubrimiento y la comprensión de nuevos conceptos en la misma materia de estudio. Así como, actividades en las que pueden crear-inventar a partir de la transferencia y aplicación de lo aprendido.

En la Etapa de Aplicación, se revisará el Programa de Formación para aumentar la probabilidad de que el profesorado: utilice más recursos relacionados con la vida real; y, plantee más actividades para la transferencia y aplicación de lo aprendido en otras materias distintas a la materia de estudio.

Como no hubo diferencias significativas de resultados por asignaturas, se podría concluir que la asignatura no es una variable dependiente. Sin embargo, en cada una de ellas, se ha observado que la **capacidad de escucha** y el **dominio de la materia** que tenga cada docente, influye considerablemente en los resultados obtenidos.

7. PROSPECTIVA

Futuras líneas de investigación del estudio que se presenta irán dirigidas al análisis comparativo del *Programa de Formación del método CEMA* una vez revisado, con un grupo experimental homogéneo para observar y valorar el avance de resultados por los cambios introducidos. Replicar el estudio con una muestra de profesorado de otras etapas educativas: Infantil, Secundaria y Universidad; en distintas áreas curriculares o materias de estudio del conocimiento académico. La réplica del estudio en ámbitos de educación no formal; así como, con una muestra de profesionales de diferentes entornos y contextos (empresa, salud, redes sociales, transmisión del conocimiento, etc.), con el fin de que personas de distintos ámbitos conozcan y utilicen correctamente el Método CEMA, como intervención para la práctica de la enseñanza.

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El aprendizaje de las propiedades sensoriales a través de la instalación artística y la indagación en Educación Infantil

Learning Sensory Properties Through Art Installation and Inquiry in Early Childhood Education

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Resumen

El presente trabajo muestra el diseño, aplicación y posterior análisis de una propuesta didáctica basada en la instalación artística y la indagación escolar que persigue explorar los avances que una muestra de 12 alumnos/as de tercero de Educación Infantil puede lograr en relación con el aprendizaje de las propiedades sensoriales de la materia y las destrezas científicas. Para ello, se han recogido y analizado las verbalizaciones de los participantes durante las asambleas inicial y final, unido a la observación directa, el registro fotográfico y la categorización de sus acciones durante la fase de experimentación. A raíz de ello, se concluye la importancia de aunar la educación artística y científica en la Educación Infantil desde una perspectiva inclusiva, proporcionando al alumnado oportunidades de aprendizaje como la presentada.

Palabras clave: propiedades de la materia, destrezas científicas, educación artística, Educación Infantil.

Abstract

This paper shows the design, application and subsequent analysis of a didactic proposal based on art installation and school inquiry that seeks to explore the progress achieved by a sample of 12 students in the third year of Early Childhood Education regarding the learning of the sensory properties of matter and the scientific skills. For this purpose, the verbalisations of the participants during the initial and final assemblies have been collected and analysed, together with direct observation, photographic recordings, and the categorisation of their actions during the experimentation phase. Conclusions highlight the need to combine art and science education in Early Childhood Education from an inclusive perspective, thus providing students with learning opportunities like the one presented here.

Key words: properties of matter, scientific skills, Art Education, Early Childhood Education.

1. INTRODUCCIÓN

Históricamente, los seres humanos hemos desarrollado diversos conocimientos acerca de la materia para utilizar y modificar los materiales necesarios para la construcción de objetos orientados a garantizar la supervivencia en la naturaleza, así como para colmar las necesidades cotidianas (Valcárcel y Sánchez, 2009). Así pues, mirar el mundo constituye una experiencia de gran riqueza para el niño/a, puesto que este alberga un sinnúmero de objetos y fenómenos valiosos con los que establece interacciones constantes día a día. Es en dichas interacciones espontáneas donde la educación, y más concretamente la educación científica, juegan un papel decisivo.

Además, durante la infancia se producen los primeros contactos con los fenómenos naturales, como la brisa del aire que hace mover las hojas, frente a los cuales los niños/as manifiestan un interés natural, queriendo conocerlos e interactuar con ellos. Esto hace que los pequeños se planteen numerosas preguntas, que ellos mismos buscan responder a través de la percepción, exploración y actuación sobre él (Mateo et al., 2020). Este planteamiento constante de preguntas y respuestas hace que tengan una motivación intrínseca por conocer el mundo que les rodea (Eshach y Fried, 2005; Ruiz de Velasco y Abad, 2016).

En palabras de Orozco et al. (2022), la curiosidad y disposición de los infantes para entender el mundo exterior actúan como fuerzas impulsoras para desarrollar conocimientos y procedimientos científicos. A su vez, Tiberghien (2003) afirma que los niños/as son muy receptivos a los estímulos que brinda el mundo natural, pudiendo iniciarse en la construcción de modelos básicos para la interpretación del entorno, los cuales deben evolucionar progresivamente hacia concepciones más cercanas a las ciencias (Rivero et al., 2017).

Este incremento, tanto en calidad como en cantidad, de ideas, destrezas y actitudes favorece la modificación y construcción de nuevo conocimiento científico, el cual brinda autonomía y capacidad de decisión en el medio habitado. Por su parte, la construcción de dicho conocimiento implica, entre otros, el aprendizaje de la materia, puesto que esta representa todo aquello con lo que convivimos diariamente. Ello conduce, en consecuencia,

a la comprensión de la realidad circundante. Así pues, el concepto de materia se dibuja como una de las primeras abstracciones a las que el alumno/a debe hacer frente en el área de las ciencias. Sin embargo, el niño/a de Educación Infantil centra su atención en lo perceptible, lo cotidiano, lo concreto, lo empírico y lo inmediato (Cañal et al., 2016).

Por todo lo anterior, el tratamiento escolar de la materia se configura como un requisito fundamental para promover que el alumnado de Educación Infantil mejore y amplíe su experiencia y conocimiento sobre los materiales, así como los posibles cambios que puede experimentar y las propiedades que los caracterizan. Ello ha constituido el propósito del presente trabajo, en el que se presenta y analiza una propuesta didáctica fundamentada en la indagación escolar y la instalación científica para el aprendizaje de las propiedades sensoriales de la materia y las destrezas científicas.

2. PLANTEAMIENTO DEL PROBLEMA

El panorama actual de las metodologías empleadas para enseñar ciencias en Educación Infantil refleja la necesidad de diseñar propuestas didácticas innovadoras que abandonen su carácter cerrado y pautado y su escasa implementación. Así pues, en investigaciones como las llevadas a cabo por Cañal et al. (2013) y Sáez-López y Ruiz-Gallardo (2012), respectivamente, se ha constatado que esta visión ha conducido al tratamiento de las ciencias en las aulas de Educación Infantil y Primaria exclusivamente a través del libro de texto y la realización de exámenes, confiriéndole a las mismas un carácter excesivamente propedéutico.

Específicamente, en el trabajo publicado por Cañal et al. (2013), se obtuvo que, si bien los maestros/as de la Educación Infantil emplean con una menor asiduidad el libro de texto que los maestros/as de la Educación Primaria, no recurren con suficiente frecuencia o continuidad en el tiempo al empleo de otras alternativas, tales como la asistencia de invitados, el entorno o la realización de sencillas experiencias. En relación con este último punto, Gómez-Motilla y Ruiz-Gallardo (2016) señalan la importancia de evitar que la enseñanza de las ciencias se reduzca a la mera manipulación durante la realización de actividades de carácter experimental.

Por otro lado, Solé-Llussà et al. (2018) analizaron 168 comunicaciones efectuadas por niños/as de Educación Infantil y Primaria en congresos de ciencia celebrados en Cataluña entre los años 2014 y 2016. En esta investigación, se obtuvieron resultados muy llamativos que permiten arrojar una visión general de las metodologías empleadas en la enseñanza de las ciencias en las etapas educativas mencionadas. En primer lugar, se detectó la presencia de dos tipos de trabajos: trabajos no indagadores, que representan el 60.1%, y trabajos indagadores, que representan el 39.9 % del total.

En lo relativo a los trabajos no indagadores, se observó que el 95 % de la muestra hace referencia a demostraciones científicas guiadas, en las que el alumnado adquiere un papel secundario en su aprendizaje siguiendo ordenadamente un conjunto de acciones secuenciadas que conducen a la comprensión del fenómeno estudiado. En cambio, el otro 5 % de los trabajos no indagadores responden a un carácter teórico y se fundamentan en libros de texto, así como en otras fuentes bibliográficas.

A lo largo de los últimos años, las políticas educativas europeas, estatales y autonómicas han advertido la necesidad de una enseñanza de carácter más activo y participativo en el conjunto de todos los niveles y contextos educativos (Solé-Llussà et al., 2018). Ello ha conducido a la comunidad educativa a apostar por la introducción de propuestas indagadoras en los currículos de Educación Infantil y Primaria (Biggs, 2003, citado en Solé-Llussà et al., 2018). De hecho, algunos autores como Bevins y Price (2016) afirman que la indagación se configura como el mejor método para la enseñanza de las ciencias. En cambio, la implementación de este enfoque metodológico para la enseñanza de las ciencias en Educación Infantil enfrenta una importante dificultad, como lo es la falta de confianza de los maestros/as de esta etapa educativa en lo referido a sus conocimientos científicos (Sáez, 2017).

Por su parte, Cañal (2006) alega que los niños/as presentan una «capacidad innata para... imaginar posibles soluciones a problemas que pueden detectar, planificar actuaciones para comprobar la validez de tales soluciones, hacer predicciones sobre lo que puede ocurrir como resultado de tales actuaciones o experiencias, etc.» (Orozco et al., 2022, p. 176). Para ello, se hace necesaria una guía adecuada basada en preguntas formuladas por el profesorado apropiadas y de interés para los niños/as, así como la realiza-

ción de propuestas escolares que conduzcan a la comprobación de la validez de estas (Cruz-Guzmán et al., 2017).

Continuando, la instalación artística propicia la manipulación de los objetos por parte de los niños/as implica la exploración de sus características y sus funciones, así como la construcción de estructuras básicas de relación, clasificación o seriación (Vecchi, 2013, citado en Martínez, 2019). Esta última idea conecta con la posibilidad de utilizar la instalación artística como recurso para trabajar las ciencias en la etapa de Educación Infantil, si bien es infrecuente el hallazgo de bibliografía en la que se establezca un vínculo entre ambas en la citada etapa.

Atendiendo a lo anteriormente expuesto, el objetivo general que ha guiado la realización del presente estudio es diseñar e implementar una propuesta didáctica en el tercer curso de la Educación Infantil para el aprendizaje de las propiedades sensoriales de la materia y el desarrollo de las destrezas científicas fundamentada en la instalación artística y la indagación escolar. Este objetivo de carácter general se materializa en una serie de objetivos específicos que a continuación se concretan:

- Explorar los avances que los alumnos/as del tercer curso de la Educación Infantil pueden lograr en relación con el aprendizaje de las propiedades sensoriales de la materia y las destrezas científicas.
- Reflexionar sobre el valor didáctico de la instalación artística y la indagación escolar desde el punto de vista del aprendizaje de las ciencias en la Educación Infantil.
- Fomentar en el alumnado del tercer curso de la Educación Infantil una actitud positiva y favorable hacia la ciencia a través de la educación sensorial.

3. FUNDAMENTACIÓN TEÓRICA

3.1 Alfabetización científica en Educación Infantil

Las actuales autoridades políticas y económicas apuntan a la necesidad de conformar ciudadanos competentes en materia científica, capaces de dar respuesta a los problemas y desafíos sanitarios, medioambientales y techno-

lógicos de la realidad mediante el empleo de las ciencias y la innovación (Rocard et al., 2007, citado en Pérez, 2018). Ello pasa por la promoción de la alfabetización científica en las aulas de Educación Infantil, orientada al tratamiento de actitudes, procedimientos y contenidos científicos básicos para todos/as a través de la práctica científica, permitiendo al alumnado decidir y actuar de manera razonada y fundamentada en base al conocimiento científico generado (Bybee y DeBoer, 1994, citado en Pérez, 2018).

Aun reconociendo la necesidad de comenzar a trabajar la alfabetización científica desde la Educación Infantil, son escasos los trabajos en el área de Didáctica de las Ciencias en esta etapa educativa, alegando como obstáculos las limitaciones lingüísticas propias de la edad infantil, así como la reducida importancia social y académica que la sociedad le otorga (Cantó et al., 2016). Ello conduce a una escasa atención y, por consiguiente, tratamiento de las ciencias en las aulas de Educación Infantil, a diferencia de otras áreas, como lo son la lectoescritura o las matemáticas, haciendo que los niños/as se encuentren poco familiarizados con ellas (Mantzicopoulos et al., 2008).

En cambio, la primera infancia constituye un periodo de especial relevancia en la vida humana. El desarrollo armónico del conjunto de las capacidades del niño/a se ve directamente condicionado tanto por su desarrollo evolutivo, como por las relaciones que este/a establece con su entorno. Así pues, se sabe que el niño/a presenta numerosas potencialidades desde el momento en el que nace. También, se expone que los primeros años de vida resultan determinantes para el futuro de cada individuo y que el desarrollo de tales potencialidades se puede ver favorecido o inhibido por las interacciones con el ambiente (Ruiz de Velasco y Abad, 2016).

Por su parte, autores como Eshach y Fried (2005) presentan diferentes argumentos que muestran la viabilidad y necesidad de abordar las ciencias en la etapa infantil debido a las potencialidades que la caracterizan. En primer lugar, destacan la motivación intrínseca que los niños/as tienen por conocer el mundo que les rodea. También, resaltan la motivación extrínseca que la ciencia escolar puede despertar en los niños/as si esta es abordada desde una perspectiva lúdica, promoviéndose actitudes positivas hacia la misma. Por otro lado, los niños/as presentan de forma temprana una comprensión y aproximación a los conceptos científicos si estos son tratados a través de contextos de aprendizaje adecuados. Por último,

los niños/as también cuentan con la capacidad para razonar científicamente fenómenos sencillos, perceptibles y cercanos a su realidad.

Por otro lado, son los propios maestros/as quienes declaran que el alumnado es capaz de llevar a cabo prácticas científicas con un adecuado acompañamiento (Spektor-Levy et al., 2013). En este sentido, el papel del maestro/a es fundamental, debiendo conducir al alumnado hacia la observación, descubrimiento y análisis de fenómenos cotidianos y motivadores para así iniciarse en la construcción de modelos. Por tanto, se considera esencial que la Educación Infantil suponga el punto de partida para la construcción de tales modelos, así como para el desarrollo de las destrezas científicas. De esta forma, el alumnado podrá conectar posteriormente las ideas construidas con aquellas que se trabajarán específicamente en la Educación Primaria y Secundaria (Mazas et al., 2018).

Para concluir, y a raíz de este último punto, se sugiere el trabajo de la observación o el pensamiento crítico como procesos científicos fundamentales para contribuir al desarrollo del pensamiento científico, a la generación de una actitud positiva hacia el mismo, así como a la construcción de unos cimientos útiles y requeridos en las etapas educativas sucesivas (Mazas et al., 2018). A ello se suman García-Carmona et al. (2014), argumentando que enseñar desde los primeros años de vida a interpretar el mundo a través de las ciencias favorece que los niños/as sean capaces de construir ideas y explicaciones basadas en criterios científicos sobre el mundo. También, es relevante la propuesta realizada en el informe ENCIENDE (2011, citado en Orozco et al. 2022), donde se recomienda iniciar la educación científica a los 3 años de edad, puesto que se incrementa el interés por las ciencias, así como por la cultura científica.

3.2 La indagación en Educación Infantil

La indagación constituye un enfoque de aprendizaje activo en la que los niños/as construyen conocimiento científico mediante la interacción entre iguales y con el maestro/a, la formulación de preguntas y la puesta en marcha de procesos como la observación, la descripción o la argumentación, entre otros. En definitiva, no solamente se abordan contenidos científicos, sino también los diversos procedimientos a través de los cuales se construyen las ciencias (Aragüés, 2021). En relación con este último aspecto, «hacer ciencia

en la escuela es el resultado de una transposición directa de lo que supone una actividad científica, de manera que hablar de indagación supone más bien hablar de estrategias a resolución a problemas» (Aragüés, 2019, p. 310).

A continuación, se va a proceder a revisar diferentes estudios sobre el aprendizaje de las ciencias en Educación Infantil a fin de conocer los resultados que comporta la indagación en este área y etapa educativa. Para comenzar, Siry y Kremer (2011) investigaron las explicaciones sobre el fenómeno del arcoíris que 5 niñas y 3 niños de entre 5 y 6 años de edad son capaces de dar en el marco de una secuencia de aprendizaje indagadora, obteniendo tres resultados muy reveladores. En primer lugar, se remarca la importancia de otorgar a los niños/as suficientes oportunidades para discutir sus propias ideas. En segundo lugar, se subraya la necesidad de que existan interacciones entre iguales para así construir de manera conjunta conceptos científicos. En tercer lugar, se incide en el papel que juegan las ideas previas del alumnado como punto de partida en el trabajo con este. Así pues, se concluye que la enseñanza de las ciencias naturales resulta de vital importancia en la primera infancia.

Por su parte, Impedovo et al. (2016) estudiaron, a través de la participación de 44 niños/as de entre 5 y 6 años de edad (13 niñas y 31 niños), los puntos de vista, las predicciones y las observaciones realizadas por estos/as ante el fenómeno de formación de las sombras empleando un pre-test, un post-test y sesiones de aprendizaje. El análisis de estas últimas arroja la importancia de las orientaciones verbales emitidas por el maestro/a, las cuales permiten una correcta predicción del fenómeno por parte de los participantes, ya que este/a permite superar las dificultades que los niños/as puedan encontrar. A su vez, se obtiene que la manipulación directa de los objetos se relaciona con la participación e implicación de los niños/as en las actividades propuestas.

En el trabajo realizado por Mazas et al. (2018) se persiguió la construcción de modelos acerca del aire y el agua para así iniciar al alumnado en el pensamiento sistémico a través de la formulación de preguntas y la realización de las correspondientes observaciones. Para ello, se realizó una primera experiencia con un grupo de 15 alumnos/as del primer curso de la Educación Infantil centrada en el aire, así como una segunda experiencia en la que participó un total de 20 alumnos/as de la misma etapa educativa

en cursos académicos diferentes. Tras su implantación, se identifica el trabajo de destrezas científicas, tales como la identificación de fenómenos, la observación, la formulación de hipótesis, la comparación y la comunicación de resultados. Además, se aprecia el interés y motivación del alumnado por dar respuesta a los interrogantes formulados.

También, los investigadores resaltan que la segunda experiencia, al presentar un carácter más cerrado que la primera, redujo significativamente la posibilidad de plantear nuevos interrogantes por parte del alumnado. Por último, las maestras de aula con las que colaboraron los investigadores, admiten sentirse más seguras con una experiencia de aprendizaje como la segunda, si bien valoran los beneficios de implantar experiencias de aprendizaje más abiertas.

Por último, Canedo-Ibarra et al. (2012) quisieron investigar sobre los posibles cambios conceptuales acerca de los seres vivos que 23 niños/as de entre 4 y 5 años podían realizar en el marco de una intervención en el aula basada en el contexto dialógico, el modelo científico y el trabajo en grupo, con la previa aplicación de un pre-test. Durante esta, los participantes pudieron intercambiar ideas y experimentar con diferentes materiales, mientras que el docente les guio, cuestionando sus ideas para así elaborar las pertinentes justificaciones.

Tras el análisis de las entrevistas, los investigadores reportaron el hallazgo de un patrón de aprendizaje en transición, es decir, de un modelo científico precursor, y un segundo patrón de aprendizaje científico, afirmando que la mayoría de los participantes consiguieron construir un modelo de ser vivo basado en el enriquecimiento y reestructuración de sus ideas previas. Finalmente, los resultados arrojan la posibilidad de promover cambios conceptuales en la etapa infantil, teniendo en cuenta sus conocimientos previos. También, se concluye que la indagación en el aula genera distintos grados de cambio en el alumnado.

3.3 La instalación artística en Educación Infantil y su posible relación con las ciencias

La instalación artística aparece como forma de expresión artística en los años 60 (Larrañaga, 2001, citado en Martínez, 2019). Esta «irrumpe en un espacio para constituirse en una obra de arte donde intervienen suelo, pare-

des, luces y otros objetos de cualquier materia y forma que se incorporen, pudiendo ser incluso inmateriales o mixtos» (Martínez, 2019, p. 314). En esta, se descontextualiza el objeto para así construir una nueva situación con intencionalidad estética, social e, incluso, política. Además, la instalación artística guía el cuerpo de quien actúa como espectador hacia el espacio de la obra, la cual es efímera. Es por ello que, para ser recordada en el tiempo, ha de documentarse por medio de vídeos y fotografías (Martínez, 2019). A raíz de esto último, Díaz (2003, citado en Rubio y Riaño, 2019) resalta la necesaria presencia participativa del espectador, quien es invitado a desplazarse y establecer una relación con la obra artística.

La aplicación educativa de la instalación artística permite concebir esta como un «ecosistema lúdico organizado por el adulto para provocar, desde un orden inicial y una propuesta estética concreta, su deconstrucción, transformación y nueva reconstrucción por parte de los niños a través del juego compartido» (Ruiz de Velasco y Abad, 2016, p. 45). En ella, el alumnado actúa sobre los objetos e interactúa con los otros/as a través de significados confeccionados conjuntamente (Ruiz de Velasco y Abad, 2016). De esta forma, los niños/as se identifican con el escenario para así llevar a cabo un proyecto estético que exige la toma de decisiones sobre cómo gestionar los lugares y los objetos presentados, desarrollando la imaginación y la creatividad (Rubio y Riaño, 2019).

Si bien la presencia de la misma es escasa en la Educación Infantil, la instalación artística da respuesta a cada una de las tres áreas del segundo ciclo de la citada etapa educativa, debido a sus tres características fundamentales. En primer lugar, la utilización del juego como recurso metodológico. A continuación, la manipulación libre y la observación de los materiales propuestos a través de la implicación de los cinco sentidos. Finalmente, el empleo del lenguaje oral y/o gráfico para la comunicación de procesos y resultados (Mateo et al., 2020). A su vez, la manipulación de los objetos por parte de los niños/as implica la exploración de sus características y sus funciones, así como la construcción de estructuras básicas de relación, clasificación o seriación (Vecchi, 2013, citado en Martínez, 2019).

Todo ello conduce a la conceptualización del término «instalación científica», entendida como un espacio libre de experimentación constituido por objetos caracterizados por su riqueza sensorial y perceptiva y cuya organización brinda una experiencia estética a cada niño/a (Mateo et al., 2020).

El maestro/a ha de propiciar la creación de un ambiente físico que favorezca el aprendizaje de las ciencias, «facilitando la elaboración de pensamiento, proporcionando emoción en el descubrimiento y placer en la transformación» (Abad, 2009, citado en Mateo et al., 2020, p. 202). En suma, el potencial de la instalación científica es interesante debido a sus características estructurales y los procedimientos científicos que en ella pueden llevar a cabo los alumnos/as (Mateo et al., 2020).

Con ella, se pretende enseñar a los niños/as a observar de forma intencionada, a identificar similitudes y diferencias o a realizar agrupaciones en base a determinados criterios de clasificación, entre otros. Las citadas acciones emprendidas por el alumnado estas permiten configurar significados de vital importancia, tales como llenar y vaciar, agrupar y dispersar, construir y destruir en un contexto de comunicación e interacción, de actuación sobre el espacio y los objetos y de construcción de significados de forma compartida (Abad y Ruiz de Velasco, 2014).

Para finalizar este apartado, se presentan dos investigaciones vinculadas al empleo de la instalación artística en Educación Infantil. Por un lado, el estudio de Rubio y Riaño (2019) fue llevado a cabo con 24 alumnos/as de 4 años siguiendo los principios metodológicos del juego simbólico, la reinención del espacio y los materiales, la perspectiva global e integradora, así como la socialización e interacción entre iguales aunados en una instalación artística centrada en el reconocimiento social de las mujeres a nivel mundial. Para ello, se tomaron como referencia los trabajos de algunas artistas contemporáneas femeninas y se propusieron diferentes objetos pertenecientes a la vida cotidiana del alumnado, rodeando el espacio con tul blanco para aportar una mayor calidez.

En un primer momento, los alumnos/as tuvieron tiempo de observar la instalación artística. Posteriormente, se procedió al juego libre y simbólico. Finalmente, los alumnos/as realizaron un dibujo acerca de lo que había sucedido. A lo largo de la experiencia, el docente observó desde una perspectiva secundaria los hechos acontecidos, interviniendo cuando se consideró necesario. Tras ello, se concluye que la instalación artística favorece la participación activa e imaginativa del alumnado, así como el desarrollo del juego simbólico, la capacidad creativa, la experimentación y el disfrute personal.

Por otro lado, la investigación llevada a cabo por Mateo et al. (2020) se centró en el potencial de 8 instalaciones artísticas, de entre 3 y 4 componentes, para el aprendizaje de contenidos científicos en el caso de 8 alumnas y 6 alumnos del tercer curso de la Educación Infantil, contando con la intervención de la maestra del aula acompañada de los citados investigadores. La intervención se estructuró en torno a cuatro fases diferenciadas: observación de la instalación y asamblea inicial, realización de un dibujo de la instalación, experimentación libre y asamblea final.

En cada una de las fases, a excepción de la tercera, la maestra formuló diversas preguntas al alumnado a fin de conocer qué contenidos y procedimientos científicos se estaban poniendo en juego a partir de sus verbalizaciones y dibujos, respectivamente. Entre estos, se obtuvo que los alumnos/as aprendieron sobre las propiedades sensoriales y mecánicas de los materiales y los objetos, así como sus usos y comportamientos debidos a estas. A su vez, desarrollaron procedimientos científicos, tales como el análisis, la descripción, la formulación y comprobación de hipótesis, la relación causa-efecto, la generalización, la comunicación de resultados o el pensamiento creativo y razonado.

También, se hallaron actitudes como la necesidad de hallar respuestas, la curiosidad o la capacidad de escucha. Por último, se apreció que el carácter abierto de esta propuesta permitió hacer frente a la diversidad del aula, trabajando las ciencias de manera inclusiva a través del juego y el arte.

4. METODOLOGÍA

4.1 Muestra seleccionada

La propuesta didáctica fue implementada durante el curso académico 2021/2022 con alumnado perteneciente a la etapa de Educación Infantil del CEIP San Sebastián, un centro educativo público ubicado en el municipio madrileño de San Sebastián de los Reyes. Actualmente, este es un Centro Preferente para Alumnado con Trastorno del Espectro Autista (TEA) de línea dos que alberga 6 unidades de Educación Infantil y 12 unidades de Educación Primaria. Por otro lado, este acoge a una población sociológica y culturalmente diversa y cuyo poder adquisitivo es medio,

encontrándose la mayoría de las familias involucradas en el proceso educativo de sus hijos/as.

Concretamente, participaron un total de 12 niños/as del tercer curso de la Educación Infantil, con edades comprendidas entre los 5 y los 6 años de edad, siendo 5 niñas y 7 niños, al existir una gran disparidad en cuanto a sexo en el grupo-clase. Uno de los niños tiene TEA y otro de ellos pertenece al programa de integración del centro, debido a las dificultades que presenta en relación con la comprensión y expresión oral.

Cabe destacar que el alumnado participante se encontraba habituado a trabajar las ciencias en el aula siguiendo un modelo de enseñanza tradicional, donde el docente comunica las pautas a seguir, de manera que no se da la posibilidad al niño/a de seleccionar la actividad o experiencia en la que desea participar. Tampoco se llevaban a cabo experiencias basadas en la indagación escolar o en la instalación científica.

4.2 Intervención docente

La intervención docente fue realizada por la autora del presente trabajo, quien dirigió las distintas fases de la propuesta didáctica, explicando a los participantes las consignas, formulando las preguntas necesarias para recoger información acerca de los contenidos y procedimientos científicos a analizar posteriormente, así como interviniendo puntualmente durante la fase de experimentación cuando se consideró necesario o a demanda de algún participante, período en el que adoptó un papel secundario.

A su vez, estuvo presente la maestra de apoyo como figura necesaria para anotar observaciones relevantes, controlar los tiempos y procurar el desarrollo óptimo de la propuesta. Por último, asistió también una alumna en prácticas del aula TEA tanto a la primera como segunda instalación artística. Ella le proporcionó el acompañamiento y la supervisión necesarios para así garantizar su inclusión y aprendizaje en la propuesta.

4.3 Instrumentos de recogida de información

Las verbalizaciones emitidas durante la asamblea inicial y final y la fase de experimentación, así como las acciones emprendidas por los niños/as en esta

última constituyeron los datos del presente estudio, cuyo carácter es cualitativo. Estos se recogieron a través de grabaciones de voz posteriormente transcritas de las conversaciones entabladas a lo largo de la asamblea inicial y final, así como a través de la observación directa de la fase de experimentación, anotando y categorizando (ver *tabla 1*) durante e inmediatamente después de la sesión lo acontecido. También, se llevó a cabo durante esta fase un registro fotográfico para así garantizar una mayor veracidad de los datos obtenidos.

4.4 Análisis de la información recogida

A partir de la información recogida, se extrajeron los contenidos científicos relativos a las propiedades sensoriales de la materia y las destrezas científicas, las motivaciones y los intereses del alumnado en cada una de las instalaciones artísticas implementadas, atendiendo a la estructura que a continuación se expone y determinando en qué medida se vieron cumplidos tras la implementación de cada una de ellas. A su vez, también se han tenido en cuenta aquellos sucesos o intervenciones llamativas y fuera del marco esperado por parte de los alumnos/as, ya que se trata de una propuesta de carácter flexible.

Tabla 1
Estructura de análisis de la información recogida

IDEAS PREVIAS DEL ALUMNADO	APRENDIZAJES LOGRADOS	APRENDIZAJES NO LOGRADOS
A raíz de la información extraída de la asamblea inicial gracias a la secuencia de preguntas formuladas.	A raíz de la información extraída de la fase de experimentación y la asamblea final y atendiendo a los contenidos de la propuesta didáctica.	A raíz de la información extraída de la fase de experimentación y la asamblea final y atendiendo a los contenidos de la propuesta didáctica.

5. PROPUESTA DIDÁCTICA

5.1 Objetivos didácticos

Se formularon los siguientes objetivos a cumplir por parte del alumnado para ambas instalaciones artísticas:

- Identificar los sentidos como una herramienta fundamental para explorar y descubrir las propiedades sensoriales de los objetos proporcionados en las distintas instalaciones científicas (1).
- Relacionar las percepciones construidas a raíz de la participación en la propuesta didáctica con emociones e intereses a fin de desarrollar una actitud positiva hacia la ciencia (2).
- Adquirir vocabulario preciso y adecuado para describir las propiedades sensoriales de los objetos propuestos en las diversas instalaciones científicas (3).
- Iniciarse en el empleo de las destrezas científicas a través del aprendizaje basado en la indagación aplicado a la Educación Infantil (4).
- Desarrollar la socialización y creatividad a través de la interacción con los otros, los objetos y el espacio en su conjunto (5).

5.2 Contenidos

Los contenidos formulados concretan los objetivos anteriormente expuestos, estructurándose de forma específica para cada una de las instalaciones artísticas.

Tabla 2

Contenidos de la primera instalación

<p>PROPIEDADES SENSORIALES DE LA MATERIA (OBJETIVOS 1 Y 3)</p>	<ul style="list-style-type: none">• Identificación del tacto como sentido necesario para percibir la textura y dureza de un objeto.• Identificación de la vista como sentido necesario para percibir el tamaño, color y forma de los objetos presentados. Asociación del sentido del tacto a su órgano correspondiente: la piel.• Asociación del sentido de la vista a su órgano correspondiente: el ojo.• Reconocimiento de la textura, la dureza, el tamaño, el color y la forma como propiedades perceptibles a través de los sentidos.• Adquisición de vocabulario específico relativo a las propiedades mencionadas: blando, suave, redondo, rugoso, duro, liso, pastoso, grande, pequeño, mediano, cuadrado, rectangular, etc.
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<p>DESTREZAS CIENTÍFICAS (OBJETIVO 4)</p>	<p><i>Destrezas técnicas:</i></p> <ul style="list-style-type: none"> • Manipulación libre de los objetos a fin de conocer sus propiedades y posibles comportamientos durante la fase de experimentación de la propuesta. <p><i>Destrezas básicas:</i></p> <ul style="list-style-type: none"> • Descripción de observaciones realizadas y situaciones producidas en la fase de experimentación de la propuesta. • Identificación de propiedades observables sensorialmente a raíz de las preguntas formuladas y puestas en común de la propuesta. • Empleo de las propiedades sensoriales como criterio de clasificación de los objetos presentados. <p><i>Destrezas de investigaciones:</i></p> <ul style="list-style-type: none"> • Reconocimiento de las semejanzas y las diferencias entre las propiedades sensoriales de los objetos presentados. • Emisión de hipótesis acerca de las propiedades sensoriales de los objetos presentados durante la asamblea inicial. <p><i>Destrezas comunicativas:</i></p> <ul style="list-style-type: none"> • Empleo del mapa conceptual para organizar y representar los aprendizajes efectuados con ayuda de la maestra en la asamblea final.
<p>EMOCIONES Y ACTITUDES (OBJETIVOS 2 Y 5)</p>	<ul style="list-style-type: none"> • Adquisición de vocabulario y expresiones para comunicar las emociones e intereses desarrollados a partir de la propuesta. • Aparición de acciones colaborativas entre iguales durante la fase de experimentación de la propuesta. • Aparición de usos divergentes de los objetos presentados en la instalación artística.

Tabla 3
Contenidos de la segunda instalación

<p>PROPIEDADES SENSORIALES DE LA MATERIA (OBJETIVOS 1 Y 3)</p>	<ul style="list-style-type: none"> • Identificación del gusto como sentido necesario para percibir el sabor de un objeto. • Identificación del olfato como sentido necesario para percibir el olor de un objeto. • Asociación del sentido del gusto a su órgano correspondiente: lengua. • Asociación del sentido del olfato a su órgano correspondiente: nariz. • Reconocimiento del sabor y el olor como propiedades perceptibles a través de los sentidos. • Adquisición de vocabulario específico relativo a las propiedades mencionadas: ácido, dulce, agradable, afrutado, fuerte, salado, etc. <p>De manera secundaria, se abordan los contenidos relativos al tacto y la vista.</p>
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<p>DESTREZAS CIENTÍFICAS (OBJETIVO 4)</p>	<p>Las destrezas científicas abordadas en esta instalación son las mismas que en la primera.</p>
<p>EMOCIONES Y ACTITUDES (OBJETIVOS 2 Y 5)</p>	<p>Las emociones y actitudes trabajadas en esta instalación son las mismas que en la primera.</p>

5.3 Propuesta y estructura de las instalaciones artísticas

La propuesta didáctica se desarrolló en dos sesiones, cada una de las cuales fue dedicada a la realización de la primera y segunda instalación artística, respectivamente. Cada una de estas sesiones, tuvo una duración aproximada de entre 50 y 60 minutos, aprovechando las sesiones de psicomotricidad para así contar con la ayuda de la maestra de apoyo, que es quien se encarga de impartirlas. Es en este punto en el que se procede a detallar específicamente cada una de las fases, si bien los resultados de la primera y segunda instalación se ofrecerán más adelante.

- *Asamblea inicial (10 minutos)*: los niños/as entran al aula de psicomotricidad con los ojos cerrados, estando la luz apagada. Al abrir los ojos, se enciende la luz y estos/as establecen un primer contacto con la instalación artística, pudiendo observarla y expresar libremente aquello que les suscita. En este punto, los niños/as se sientan, junto a la autora del trabajo y la maestra de apoyo, alrededor de la instalación artística, momento en el que la primera de ellas comienza a formular una batería de preguntas destinada a conocer sus primeras impresiones, así como a detectar sus conocimientos previos. A continuación, se muestra una posible secuencia de preguntas, realizadas en función de la respuesta dada por el alumnado.

Tabla 4

Preguntas de la asamblea inicial

<ul style="list-style-type: none"> • ¿Qué objetos veis? • ¿Cómo son los objetos que veis? • ¿En qué creéis que se parecen estos objetos? • ¿En qué creéis que se diferencian los objetos que estáis observando? • ¿Qué pensáis que sentiréis al coger los objetos? • ¿Cómo os sentís en este momento?, ¿os apetece jugar con estos objetos?

- *Experimentación en la instalación artística:* la autora del trabajo comunica al alumnado que es momento de jugar con los objetos presentados de la manera en la que ellos/as deseen. La única regla comunicada es no pelearse por utilizar o coger los objetos, ya que hay suficientes para todos/as. Durante la experimentación, se valora la necesidad de intervenir en momentos puntuales o de formular preguntas al alumnado, como las que a continuación se presentan. Sin embargo, debe evitarse la intervención, convirtiéndose el docente en un agente secundario.

Tabla 5

Preguntas de la fase de experimentación libre

- ¿Qué ves?, ¿qué sientes al tocar este objeto?, ¿a qué huele?, ¿a qué sabe?, ¿cómo suena?
- ¿Cómo es el objeto con el que estás jugando?
- ¿Son iguales estos objetos?, ¿en qué se parecen?, ¿ves alguna diferencia entre ambos?
- ¿Cómo te estás sintiendo?, ¿te está gustando la actividad?

- *Asamblea final:* la autora del trabajo comunica al alumnado que el tiempo de jugar ha terminado, debiendo volver a sentarse en círculo. Se formulan preguntas, cuya precisión va aumentando conforme avanza la conversación, como las que a continuación aparecen y se valora su necesidad en función del grado participación y razonamiento del alumnado. Las respuestas a dichas preguntas se van organizando junto al alumnado en forma de mapa conceptual, siendo este el producto final de la sesión.

Tabla 6

Preguntas de la asamblea final

- ¿Cómo era el objeto?
- ¿Eran iguales estos objetos?, ¿en qué se parecían?, ¿en qué eran diferentes?
- ¿Cómo puede ser la textura/dureza/color/forma/tamaño/sabor/olor/sonido de los objetos?
- ¿Con qué sentido habéis percibido la textura/dureza/color/forma/tamaño/sabor/olor/sonido de este objeto?
- ¿En qué parte del cuerpo se encuentra el gusto/olfato/oído/tacto/vista?
- ¿Cómo os habéis sentido?, ¿os gustaría volver a participar en la actividad?

5.3.1 Primera instalación: tacto y vista

En la primera instalación, que adopta una disposición espacial en forma de círculos concéntricos, se abordan de manera específica las propiedades sensoriales relativas al tacto y la vista, a través de la presentación de los siguientes objetos:

- *Pompones de diferentes colores y tamaños*: son blandos (dureza), suaves (textura) y redondos (forma).
- *Piñas secas*: son rugosas (textura), duras (dureza) y cónicas (forma).
- *Bloques de plastilina de diferentes colores y tamaños*: es dura y posteriormente blanda (dureza), lisa y pastosa (textura), rectangular (forma).

5.3.2 Segunda instalación: gusto y olfato

En la segunda instalación, que adopta una disposición espacial en forma de espiral, se abordan de manera específica las propiedades sensoriales relativas al gusto y el olfato, a través de la presentación de los siguientes objetos:

- *Naranjas enteras y en rodajas*: son agradables y afrutadas (olor) y ácidas o dulces (sabor). Además, son naranjas (color), duras (dureza), rugosas -piel- y húmedas (textura) y redondas (forma).
- *Canela en rama*: es aromática y dulce (olor) y dulce y ligeramente picante (sabor). Además, es marrón (color), dura (dureza), suave y polvoriento (textura) y cilíndrica (forma).
- *Sal gorda*: es inodora (olor) y salada (sabor). Además, es blanca (color), dura (dureza y granulada y áspera (textura).
- *Pastillas de jabón de agua termal y lavanda*: son agradables, fuertes y florales (olor) y no comestibles (sabor). Además, son duras (dureza), lisas y suaves (textura) y rectangulares o circulares (forma).

5.4 Evaluación del alumnado, de la propuesta y autoevaluación docente

En primer lugar, la evaluación del alumnado se basó en el análisis y posterior reflexión de las diversas preguntas formuladas durante la propues-

ta, así como en la observación directa de sus acciones y comportamientos. De esta forma, se llevó a cabo una evaluación continua orientada a identificar la evolución de sus ideas en relación con las propiedades sensoriales de la materia, el desarrollo de las destrezas científicas y la aparición de emociones y actitudes. En lo relativo a la evaluación de la propuesta, se analizó el desarrollo general de ambas sesiones atendiendo a los siguientes ítems:

Tabla 7

Ítems de evaluación de la propuesta didáctica

- El tiempo empleado en cada una de las fases de la propuesta didáctica se adecúa a las necesidades propias de la etapa infantil.
- El espacio destinado a la instalación artística es amplio y permite que los niños/as exploren con comodidad las diferentes propiedades sensoriales de los objetos, posibilitando, a su vez, su libre movimiento.
- El diseño de la propuesta didáctica resulta pertinente para el tratamiento de los objetivos y los contenidos a trabajar.
- El carácter guiado de las asambleas inicial y final permite al alumnado formular hipótesis y comunicar ideas.
- El carácter libre y abierto de la fase de experimentación permite al alumnado explorar de forma autónoma las propiedades de los materiales.

Para concluir, es igualmente necesario llevar a cabo una autoevaluación docente. En este caso, la autora del trabajo analizó posteriormente su actitud a lo largo del desarrollo de las sesiones, identificando las dificultades e inconvenientes surgidos en estas. Asimismo, se efectuó una coevaluación docente con la maestra de apoyo, permitiendo analizar la forma de actuar de ambas para así implementar mejoras en futuras oportunidades de trabajo con los niños/as.

6. RESULTADOS

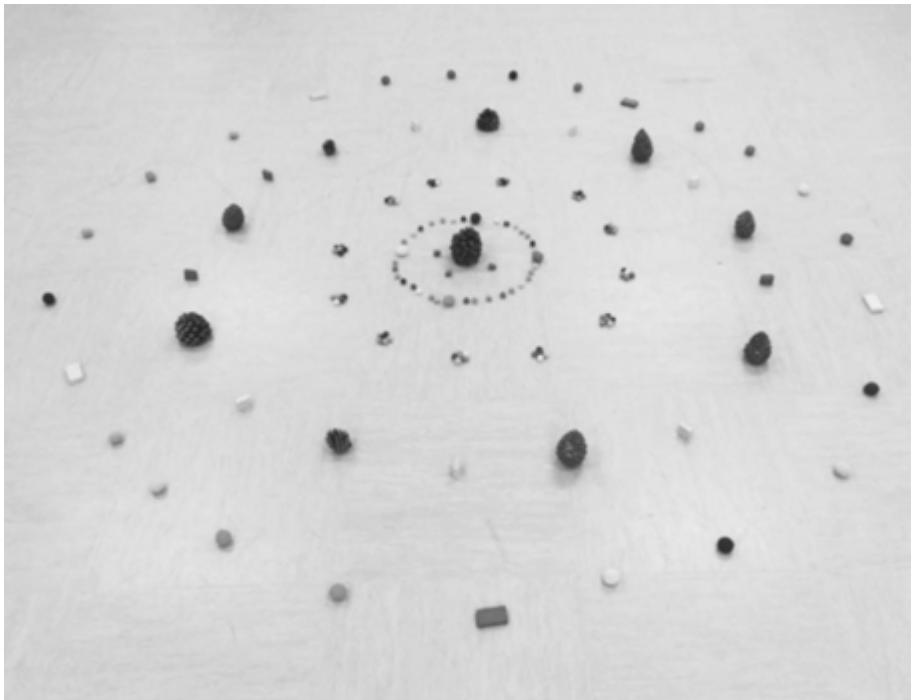
6.1 Primera instalación: tacto y vista

En primer lugar, se va a proceder a describir los resultados que se obtuvieron en la asamblea inicial, lo cual permite conocer las ideas previas del alumnado para, de esta forma, observar cómo evolucionaron a lo largo de

esta primera instalación artística. Cuando se formuló la pregunta «¿qué objetos veis?», los participantes no solamente hicieron alusión a los pompones, nombrados como «bolitas de algodón» o «pelotas», las piñas o los bloques de plastilina, sino que mencionaron algunas de sus características perceptibles a través del sentido de la vista como la forma y el color, al no poder tocar aún los distintos objetos.

Figura 1

Disposición inicial de la primera instalación artística



En cambio, ninguno de los niños/as identificó inicialmente el color como propiedad sensorial de la materia. A continuación, al preguntar «¿cómo son los objetos que veis?» fue necesario concretar dicho interrogante: «si yo no pudiera ver los objetos que tenemos delante, ¿cómo los describiríais?» De nuevo, se volvieron a identificar la forma y el color de cada uno de los objetos presentados, a excepción de la forma de los pompones. En sus respuestas a esta pregunta emplearon un vocabulario más amplio que refleja el reconocimiento de los diferentes grados de una misma propiedad (ver *tabla 8*).

Tabla 8

Ideas previas del alumnado sobre la forma y el tamaño de los objetos

FORMA DE LOS OBJETOS	<ul style="list-style-type: none">• Veo cuadrados.• Hay rectángulos.• Hay ovalados.
TAMAÑO DE LOS OBJETOS	<ul style="list-style-type: none">• Bolitas grandes.• Bolas pequeñas.• Las bolitas de algodón son gigantes.• Las bolitas son muy grandes porque las habéis hecho con algodón y no os habéis dado cuenta.• Hay bolitas grandes y pequeñas alrededor de la piña grande.• Esa es la reina grande creo (aludiendo al gran tamaño de la piña central).• Las piñas son grandes y medianas.• Las dos piñas pequeñas son estas.• Hay trocitos más pequeños de plastilina alrededor de la piña.

A continuación, se formuló la pregunta «¿en qué creéis que se parecen estos objetos?», la cual tuvo que concretarse con interrogantes como: «¿en qué se parecen una piña y un pompón?» o «¿la plastilina se parece en algo a las piñas?» Al igual que en las anteriores preguntas, se hizo necesario preguntar por cuestiones concretas al alumnado para facilitar la identificación de las propiedades sensoriales. Se detectó que los participantes no hallaron semejanzas, respondiendo a las preguntas únicamente con las diferencias observadas entre los objetos.

Así pues, fueron capaces de encontrar algunas diferencias sobre la forma, el color y la dureza de las piñas en relación con la plastilina y los pompones, respectivamente: «porque no tienen la misma figura, los pompones no tienen punta (en relación con las piñas)», «algunas piñas son blancas (desgaste) y los pompones son de colores» o «esto es más blando (plastilina) y esto es más fuerte (piñas)». Igualmente, otras de sus respuestas desprendieron dificultades para hallar tales diferencias: «porque algunos son piñas, otros son plasti, algunos son algodones».

A continuación, las respuestas frente a la pregunta «¿qué pensáis que sentiréis al coger los objetos?» reforzaron la identificación de la dureza como

propiedad sensorial. Sobre las piñas, volvieron a decir que son duras y fuertes y sobre los pompones y la plastilina, dijeron que eran blandos, sin llegar a especificar que los pompones lo son más que la plastilina. A su vez, algunos niños/as reconocieron la masa «la piña es pesada» y la temperatura «la plastilina está calentita». Finalmente, los participantes mostraron un gran interés inicial por jugar con los distintos objetos propuestos: «yo quiero jugar con esto» o «yo quiero con la plasti».

Por otro lado, las respuestas a las preguntas formuladas durante la fase de experimentación (ver *tabla 9*) permitieron comprobar que los alumnos/as continuaron reforzando y ampliando sus conocimientos sobre las propiedades sensoriales de la materia. Así pues, apareció por primera vez la identificación de la textura, puesto que algunos niños/as comunicaron que las piñas «pinchan, son como de cristal y tienen picos», aludiendo, de manera indirecta, a la textura rugosa de los objetos. A su vez, los alumnos/as lograron establecer nuevas semejanzas y diferencias, al poder tocar los objetos, en relación al color y la textura.

Por ejemplo, «aquí hay pinchos (piña) y aquí no hay (pompón)», «los colores de la plastilina se pueden mezclar y los de los pompones no» o «esto no es del mismo color». Si bien los alumnos/as habían hallado diferencias relativas a la dureza en la asamblea inicial entre la plastilina y las piñas, en la experimentación también se extrapolaron a los otros objetos. Es decir, ciertos alumnos/as consiguieron establecer un mayor número de conexiones: «este es más blando (pompón) y este es más fuerte (piña)» y «este es duro (bloque de plastilina) y este es blando porque tiene algodón dentro (pompón)».

En esta misma fase, se observaron también diversas conductas y expresiones por parte de los participantes que permitieron identificar la puesta en marcha de otras destrezas científicas, aparte de la emisión de hipótesis o el establecimiento de semejanzas y diferencias entre los objetos, como se ha reflejado con anterioridad. Así pues, en lo relativo a la manipulación de los objetos, las niñas presentaron especial interés por manipular los distintos bloques de plastilina, mezclando sus colores y alterando su forma inicial. Los niños, en cambio, se decantaron por el empleo de los tres objetos presentados, realizando diferentes composiciones y construcciones con todos ellos. A su vez, cabe destacar que la disposición espacial inicial de la instalación artística desapareció por completo debido a la citada manipulación.

Tabla 9
Conceptos verbalizados por el alumnado durante la fase de experimentación

COLOR	<ul style="list-style-type: none">• Tengo este color de plasti en casa.• Uno rojo y uno azul (pompones).• - No los mezcles (plastilina). - ¡Pero si es del mismo color!• He mezclado tres colores (plastilina).• ¡Qué colorido! (mezcla de colores de la plastilina).• Este no es rojo, este es fucsia (pompón).
TAMAÑO	<ul style="list-style-type: none">• Tráeme un pompón muy pequeñito, el que más te guste.
FORMA	<ul style="list-style-type: none">• Yo voy a hacerlo ovalado (cambio de la forma inicial de la plastilina).• ¡Aplasta! (cambio de forma de la plastilina).

También, se produjeron diversas clasificaciones según el tipo de objeto, pero no en base a las propiedades sensoriales. Así pues, los niños agruparon prácticamente la totalidad de las piñas y, además, realizaron alineaciones con los bloques de plastilina. Se identificaron, además, diversas manifestaciones de juego simbólico, con expresiones tales como: «soy la madre porque soy la más grande» o «¿hacemos un muñeco de nieve y luego le ponemos pelo y brazos?». Continuando con el juego, este se produjo de manera colectiva y, esencialmente, diferenciada entre niños y niñas, si bien existió cooperación entre ambos sexos en algunos momentos: «¡le voy a hacer a Jorge una valla súper grande!».

Para concluir, en la asamblea final se decidió preguntar inicialmente a los niños/as por la textura y dureza de los objetos, al haber observado que durante la fase de experimentación estas no habían sido mencionadas de forma espontánea por su parte, a diferencia del color, la forma y el tamaño. Así pues, se observó que uno de los participantes continuó confundiendo textura y dureza, a pesar de haber manipulado los distintos objetos. Por ejemplo, al preguntar «¿cómo es la textura del pompón?», algunos alumnos/as respondieron que el pompón es suave, mientras que este respondió que es blanda, término que hace referencia a la dureza de los materiales. También ocurrió con otros objetos («¿la piña es suave?»), ya que otro de los participantes indicó que la piña no es suave (textura), sino dura (dureza).

En cambio, el color, la forma y el tamaño fueron correctamente identificados por todos ellos/as, confirmándose así sus hipótesis iniciales sobre los objetos previamente observados. Igualmente, el vocabulario que fueron mencionando en relación con las cinco propiedades sensoriales fue inmediatamente transcrito al mapa conceptual para, de esta forma, formar una imagen global sobre los aprendizajes efectuados en la sesión (ver *tabla 10*).

Tabla 10
Vocabulario del mapa conceptual en la asamblea final

PROPIEDADES	VOCABULARIO
COLOR	Colorines, rosa, negro, arcoíris, verde, azul, marrón, rojo, claro y oscuro.
FORMA	Cuadrado, ovalado, redondo, triangular y rectangular.
TAMAÑO	Grande, mediana y pequeño.
TEXTURA	Suave y pinchos (rugosa).
DUREZA	Blanda y dura.

Por otro lado, fue necesario guiar de forma muy directa al alumnado para realizar la asociación textura-tacto y dureza-tacto, tal y como evidenciaron algunas de sus respuestas. Por ejemplo, frente a la pregunta «¿a través de qué sentido sabemos si el objeto es duro, blando, suave...?», se registraron respuestas como «yo creo que está blando» o «esto es más blando que esto». Concretando aún más dicha pregunta («¿cómo sabes que algo está blando?, ¿con qué lo tocas?»), los participantes contestaron con las manos, asociando, finalmente, que estas se vinculan con el sentido del tacto: «el tacto es de las manos». En cambio, no se logró identificar de forma específica la piel como órgano sensorial.

En el caso del sentido de la vista, los alumnos/as no hallaron dificultades. Se preguntó, por ejemplo, «¿a través de qué sabéis que un objeto es, por ejemplo, de color rojo?», frente a lo que se obtuvo: «a través de los ojos» que, posteriormente, fue concretado: «los ojoses donde está la vista». También, los alumnos/as manifestaron la motivación que esta dinámica les

supuso: «hemos hecho muchas cosas chulas» o «a mí me ha gustado lo de la plastilina y lo del pompón porque era blando», produciéndose una asociación entre las percepciones construidas y sus propias emociones.

6.2 Segunda instalación artística: gusto y olfato

En primer lugar, se va a proceder a describir los resultados que se obtuvieron en la asamblea inicial, lo cual permite conocer las ideas previas del alumnado para, de esta forma, observar cómo evolucionaron a lo largo de esta segunda instalación artística. Cuando se formuló la pregunta «¿qué objetos veis?», los participantes identificaron los cuatro objetos presentados si bien la canela en rama no fue correctamente nombrada, debido a que no sabían lo que era: «palos, palitos, barquillos de chocolate». A diferencia de la primera instalación, los alumnos/as no hicieron alusión a ninguna de sus propiedades observables sin ser previamente preguntados.

Figura 2

Disposición inicial de la segunda instalación artística



A continuación, al preguntar «¿cómo son los objetos que veis?» fue necesario concretar dicho interrogante, mencionando uno a uno dichos objetos. Así pues, frente a la pregunta «¿cómo son las naranjas?», fue reconocida únicamente la forma de las mismas (redondas las naranjas enteras y triangulares las naranjas cortadas). Lo mismo sucedió en el caso de los jabones, los cuales fueron descritos como «cuadrados, ovalados y rectangulares». Contrariamente, la sal y la canela fueron identificadas por su color, como «blanca y marrón», respectivamente. Debido a que los niños/as no conocían la canela en rama, en sus respuestas la asemejaron con objetos conocidos para ellos/as: «como un palo» o «la canela se parece a la rama de un árbol».

Más tarde, se formuló la pregunta «¿en qué creéis que se parecen estos objetos?», la cual tuvo que concretarse con interrogantes como: «¿se parecen en algo el jabón y la sal?» o «¿se parecen en algo el jabón y la naranja?» Al igual que en las anteriores preguntas, se hizo necesario preguntar por cuestiones concretas al alumnado para facilitar la identificación de las propiedades sensoriales. En esta ocasión, los participantes sí que hallaron semejanzas en cuanto al color y la forma, respectivamente: «el jabón y la sal son blancos» y «la naranja es circular como el jabón».

En cambio, el hallazgo de diferencias entre objetos fue llamativamente superior al hallazgo de semejanzas entre estos, al mencionarse no solo expresiones relacionadas con el color y la forma, sino también con el tamaño y los usos que pueden darse. Por ejemplo, los alumnos/as afirmaron que la naranja y la sal son diferentes en «el color y en el círculo», que «la canela se toma en el arroz con leche y la sal se le echa a la tostada» o que «la sal es pequeña y el jabón es más grande».

Continuando, surgieron afirmaciones relativas al gusto y al olfato por parte de los alumnos/as cuando se les formuló la pregunta: «¿qué sentiréis al manipular los objetos?», las cuales se exponen en la *tabla 11*. También, mostraron ganas de participar en la propuesta planteada.

Tabla 11

Expresiones de los participantes en cuanto al gusto y el olfato

GUSTO	<ul style="list-style-type: none">• Yo nunca he probado la canela.• La naranja está rica.• ¿Sabes que a mí me encanta la fruta?• El jabón no se puede comer.• La sal se echa a algunas comidas para que estén saladas.
OLFATO	<ul style="list-style-type: none">• La canela huele bien.• Huele a naranja.• El jabón huele bien.• La sal no huele a nada.• La naranja me huele súper bien.• Las enteras (naranjas) no huelen a nada.

A diferencia de la primera instalación, no fue necesaria la formulación de preguntas por parte del docente durante la fase de experimentación, puesto que realizaron suficientes verbalizaciones espontáneas que mostraron el refuerzo y ampliación de sus conocimientos sobre las propiedades sensoriales de la materia y, más específicamente, sobre el sabor y el olor, las cuales constituyen el objeto principal de la segunda instalación artística: «¡Qué bien huele!», «esto no se puede comer», «me está picando», «la sal es salada», «me encanta el sabor de la naranja», «está pegajoso, hay que echarle más zumo de naranja», etc.

En esta misma fase, se observaron también diversas conductas y expresiones por parte de los participantes que permitieron identificar la puesta en marcha de otras destrezas científicas, aparte de la emisión de hipótesis, como se ha reflejado con anterioridad. Así pues, en lo relativo a la manipulación de los objetos, tanto niños como niñas mostraron un especial interés inicial por las naranjas cortadas, ya que todos ellos/as comieron alguno de los trozos, no quedando ninguno sin comer. A su vez, cabe destacar que la disposición espacial inicial de la instalación artística desapareció por completo debido a la citada manipulación. Por otro lado, no se produjeron clasificaciones atendiendo a las propiedades sensoriales puestas en juego, pero sí que se establecieron semejanzas respecto al sabor y al olor: «la sal parece nieve porque es blanca» o «parece un spa porque huele mucho a jabón».

En relación con el juego, este tuvo una presencia notable a lo largo de esta segunda fase, dándose numerosos usos divergentes a los objetos propuestos. Por ejemplo, las naranjas enteras fueron empleadas como pelotas que lanzaron por el aire o para jugar al fútbol: «tú metes gol allí». Debido a los golpes, estas se fueron abriendo, momento en el que empezaron a utilizar el jugo de estas para mezclarlo junto a la sal con la ayuda de la canela en rama, que fue usada como palo para remover. También, jugaron a dispersar la sal por el suelo, depositándola en sus manos y soltándola por todo el suelo de la sala de psicomotricidad.

A su vez, las pastillas de jabón fueron empleadas como pelotas de fútbol, como patines para los pies o como pan de molde para hacer un sándwich. Así pues, se observa que todos los objetos presentados estuvieron sujetos al juego. De nuevo, este juego se produjo de manera colectiva y, esencialmente, diferenciada entre niños y niñas, si bien existió cooperación entre ambos sexos en algunos momentos. Los niños optaron por jugar al fútbol, mientras que las niñas prefirieron hacer mezclas.

Para concluir, en la asamblea final se volvió a preguntar específicamente por el sabor y el olor de los objetos, observándose un incremento de vocabulario al respecto, que se fue transcribiendo en la medida de lo posible en el mapa conceptual mostrado en la *tabla 12*. En este, también se reflejaron de forma secundaria las propiedades relativas al tacto (dureza y textura) y a la vista (tamaño, color y forma).

Tabla 12
Vocabulario de la asamblea final

PROPIEDAD	VOCABULARIO
SABOR	Ácido, dulce, especial, rico, salado, picante y bueno.
OLOR	A flores, a mar, a frutas, agradable, desagradable.
COLOR	Naranja, blanco, marrón y claro.
FORMA	Recto, redondo, ovalado, rectangular y cuadrado.
TAMAÑO	Pequeño, grande, mediano.
TEXTURA	Rugosa, suave, jugosa.
DUREZA	Dura.

Por otro lado, se realizaron preguntas destinadas a que los alumnos/as efectuasen la conexión sentido-propiedad y sentido-órgano sensorial. En todos los casos, los alumnos/as identificaron correctamente ambos tipos de relación, hallando menores dificultades que en la instalación científica anterior. Esto último puede haber sucedido debido a que en esta segunda propuesta se produjo una exploración más amplia de los sentidos (gusto y olfato) por parte de los participantes, ya que estos/as probaron y olieron en numerosas ocasiones los objetos presentados. También, los alumnos/as manifestaron la motivación que esta dinámica les supuso: «me ha encantado poder comer las naranjas porque estaban muy ricas» o «quiero un jabón como esos porque huele genial», produciéndose una asociación entre las percepciones construidas y sus propias emociones.

7. CONCLUSIONES Y PROSPECTIVA

En primer lugar, se van a interpretar los resultados obtenidos tras la implantación de las dos instalaciones, determinando las implicaciones educativas de los mismos. En consecuencia, se van a valorar, de forma paralela, los tres objetivos que guían el presente estudio. Para comenzar, el primer objetivo de este estudio ha sido explorar los avances que los alumnos/as del tercer curso de la Educación Infantil pueden lograr en relación con el aprendizaje de las propiedades sensoriales de la materia y las destrezas científicas. En relación con ello, y como primera conclusión, puede afirmarse que la aplicación de la propuesta didáctica ha permitido, en líneas generales, cumplir de forma satisfactoria los objetivos y contenidos de la misma, puesto que el alumnado participante ha desarrollado progresivamente conocimiento científico relativo a las propiedades sensoriales de la materia y ha empleado diversas destrezas científicas que a continuación serán analizadas.

Por ejemplo, la identificación inicial en la asamblea de las propiedades sensoriales hace alusión directa al sentido de la vista, lo cual resulta coherente, pues es el único sentido que se les permite emplear a los participantes en un primer momento: «¿qué objetos veis?, ¿cómo son esos objetos?». En consecuencia, los alumnos/as han reconocido el color y la forma en ambas instalaciones, pero no aquellas propiedades sensoriales relativas al tacto, el olfato o el gusto.

En cambio, la formulación progresiva de preguntas conductoras en esta primera fase, así como la participación en la fase de experimentación han permi-

tido que el alumnado incluya expresiones y emita un mayor vocabulario relacionado con todos los sentidos mencionados a lo largo de la asamblea final, los cuales han quedado reflejados en el mapa conceptual elaborado conjuntamente. Ello evidencia, a modo de segunda conclusión, que el alumnado del tercer curso de Educación Infantil es capaz de lograr avances en el aprendizaje de las propiedades sensoriales con la debida guía y la propuesta de actividades motivadoras y globalizadores, como lo es la instalación artística.

Como tercera conclusión, se ha determinado que una de las principales dificultades del alumnado de 3º de Educación Infantil es el hallazgo de semejanzas. Por este motivo, se piensa que la mera observación en el día a día no resulta suficiente, siendo necesario que los alumnos/as lleven a cabo observaciones sistematizadas y guiadas que les permitan centrar su atención en las similitudes que guardan los objetos entre sí. Otra de las destrezas científicas que se ha visto desarrollada en menor medida es la clasificación atendiendo a una propiedad sensorial de forma espontánea durante la fase de experimentación, lo cual indica, nuevamente, la necesidad de que estas sean efectuadas con una guía adecuada por parte del docente. Ello se ha observado en la asamblea final, donde, a través de preguntas conductoras, los alumnos/as han sido capaces de clasificar los diversos objetos presentados en base a las propiedades sensoriales estudiadas.

En cambio, el hallazgo de diferencias ha sido mayor, debiéndose, en parte, a la gran disparidad de los objetos presentados. Otras de las destrezas científicas que se han visto plenamente desarrolladas son la manipulación generalizada de los objetos en ambas instalaciones artísticas, la cual ha permitido que los propios alumnos/as emitan verbalizaciones espontáneas relativas al tamaño, color, forma, olor y sabor, respectivamente. Este punto sugiere la necesidad de plantear actividades en el aula fundamentadas en esta destreza científica, ya que permite la exploración física del mundo que nos rodea.

Seguidamente, la emisión de hipótesis ha sido correctamente efectuada, lo cual implica la necesidad de dar cabida a los conocimientos previos del alumnado como punto de partida en sus aprendizajes. Por todo lo anteriormente expuesto, se ha obtenido como cuarta conclusión, que el alumnado del 3º curso de Educación Infantil es igualmente capaz de aprender y desarrollar destrezas científicas con la debida guía y la propuesta de actividades motivadoras y globalizadores, como lo es la instalación artística.

A continuación, como segundo objetivo, se ha perseguido reflexionar sobre el valor didáctico de la instalación artística y la indagación escolar desde el punto de vista del aprendizaje de las ciencias en la Educación Infantil. Al respecto, el desarrollo y posterior análisis de la propuesta didáctica ha permitido evidenciar, como quinta conclusión, la complementariedad de ambos principios metodológicos, los cuales han permitido brindar al alumnado una experiencia estética y favorecedora de aprendizajes de índole científica. La estructuración en tres fases de aprendizaje, donde la segunda de ellas ha tenido como protagonista la instalación artística, ha permitido que los participantes generen sus propias ideas previas, las comprueben y las registren, al mismo tiempo que han podido jugar, relacionarse, negociar, experimentar y manipular los distintos objetos propuestos. Así pues, ello conduce a pensar que el arte y las ciencias pueden retroalimentarse de forma positiva en el aprendizaje de los niños/as.

A su vez, ambos enfoques han permitido posicionar al alumno/a como protagonista de su aprendizaje, al experimentar de forma libre y autónoma las distintas propiedades sensoriales de la materia. Pero, al mismo tiempo, se ha otorgado una guía pertinente en forma de preguntas conductoras para que el alumno/a pudiese observar e identificar de forma intencionada nuevos conceptos, relaciones y destrezas ajustadas a las capacidades propias de su edad. En definitiva, la utilización combinada de la instalación artística y la indagación escolar en el aula de Educación Infantil no solamente es posible, sino útil y positiva en el aprendizaje de los niños/as.

Finalmente, se ha querido fomentar en el alumnado del tercer curso de la Educación Infantil una actitud positiva y favorable hacia la ciencia a través de la educación sensorial. Se ha despertado un gran interés en los niños/as que no solo se ha dado inicialmente, sino que se ha mantenido a lo largo del desarrollo de las tres fases de aprendizaje. Se cree que ello es debido a la disposición estética de ambas instalaciones artísticas, las cuales han invitado a la manipulación y el juego con los distintos objetos presentados. Gracias a ello, es posible determinar que este enfoque didáctico genera sentimientos y emociones positivas hacia el aprendizaje, así como un alto grado de participación en el aula por parte de diferentes perfiles de alumnado, constituyendo una práctica inclusiva que atiende los distintos niveles comprendidos en una misma aula.

Por todo ello, se puede afirmar, como sexta y última conclusión, que a través de la instalación artística y la indagación escolar se puede favorecer la génesis de futuras vocaciones científicas, ya que los alumnos/as participan, disfrutan, se divierten y no conciben estar aprendiendo ciencias en sentido estricto y desde una perspectiva formal, como suele ser habitual en la actualidad. En contraposición, se han detectado actitudes diferenciadas por sexo. Este punto indica la necesidad de continuar fomentando la coeducación en las aulas, a fin de que tanto niños como niñas se enriquezcan a través del juego conjunto dentro y fuera de los espacios educativos.

Finalmente, como futuras líneas de trabajo, se sugiere, por un lado, poner en práctica una instalación que trabaje el sentido del oído, el cual no ha sido abordado y, por otro lado, aplicar las instalaciones propuestas con un mayor número de grupos a fin de determinar su eficacia y viabilidad en distintos contextos. También, investigar la manera en la que esta propuesta didáctica en su totalidad podría ser trasladada al primer ciclo de Educación Primaria.

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Agenda 2030: Challenges in the Application of the Sustainable Development Goals in University Teaching

Agenda 2030: Desafíos en la aplicación de los Objetivos de Desarrollo Sostenible en la enseñanza universitaria

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Abstract

After the United Nations Sustainable Development Summit in 2015, the elaboration of an action plan that arises from the classrooms with a view to raise students' awareness without undermining the teaching of the chosen subjects is imperative. This research collects the difficulties found, as well as the solutions reached in the introduction of the Sustainable Development Goals in the teaching of the subject History of English-Speaking Countries which belongs to the degree in English Studies of the University of Alcalá.

Key words: Sustainable Development Goals, research, teaching innovation, Higher Education, english.

Resumen

Tras la celebración de la cumbre de Cumbre de las Naciones Unidas sobre el Desarrollo Sostenible en 2015 se ha hecho imperativo la realización de un plan de acción que surja desde las aulas con el fin de concienciar a los alumnos sin desvirtuar la docencia de las asignaturas que han escogido. Esta investigación recoge las dificultades encontradas, así como las soluciones alcanzadas en la introducción de los Objetivos de Desarrollo Sostenible en la docencia de la asignatura Historia de los Países de Habla Inglesa perteneciente al grado en Estudios Ingleses de la Universidad de Alcalá.

Palabras clave: Objetivos de Desarrollo Sostenible, investigación, innovación docente, educación universitaria, inglés.

1. INTRODUCTION

From 25th to 27th September 2015, more than 150 world leaders belonging to all the member states of the United Nations gathered in its headquarters, located in the city of New York, in the United Nations Sustainable Development Summit. In this meeting, the leaders debated and analysed the worrying global situation and decided to put into practice a new international plan entitled *Transforming Our World: The 2030 Agenda for Sustainable Development by 2030*, in which 17 Sustainable Development Goals (SDGs) and 169 targets were passed as part of the 2030 Agenda for Sustainable Development. This plan aims at reaching an agreement to fulfil the Goals in a period of 15 years. The 17 goals which were passed by the members of the UN and which are reflected in the meeting records of The General Assembly include a series of ambitious measures to improve social and environmental conditions, which will result in the improvement of the quality of life of all the people of the world:

1. No poverty: End poverty in all its forms everywhere.
2. Zero Hunger: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Good health and well-being: Ensure healthy lives and promote well-being for all at all ages.
4. Quality education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Gender equality: Achieve gender equality and empower all women and girls.
6. Clean water and sanitation: Ensure availability and sustainable management of water and sanitation for all.
7. Affordable and clean energy: Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Decent work and economic growth: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

9. Industry, innovation and infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
10. Reduced inequalities: Reduce inequality within and among countries.
11. Sustainable cities and communities: Make cities and human settlements inclusive, safe, resilient and sustainable.
12. Responsible consumption and production: Ensure sustainable consumption and production patterns.
13. Climate action: Take urgent action to combat climate change and its impact.
14. Life below water: Conserve and sustainably use the oceans, sea and marine resources for sustainable development.
15. Life on land: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt reverse land degradation and halt biodiversity.
16. Peace, justice and strong institutions: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
17. Partnerships for the goals: Strengthen the means of implementation and revitalize the Global partnership for Sustainable Development. (United Nations, 2015)

The SDGs were ratified two months later at the 2015 Paris Conference on Climate Change as the Paris Agreement. Truth to be told, during the next four years, the results were not as optimistic as they were originally expected due to the slowness and low impact caused by the measures, as Liu Zhenmin, Under-Secretary-General for Economic and Social Affairs in the United Nations' Sustainable Development Goals Report from 2019, commented:

Four years after signing the 2030 Agenda for Sustainable Development, countries have taken action to integrate the Goals and targets into their national development plans and to align policies and institutions behind them. The Sustainable Development Goals

Report 2019 uses the latest available data to track global progress on the SDGs and to take stock of how far we have come in realizing our commitments. The report shows that, while advances have been made in some areas, monumental challenges remain. The evidence and data spotlight areas that require urgent attention and more rapid progress to realize the 2030 Agenda's far-reaching vision. (Zhenmin, 2019, p. 3)

Having less than 10 years ahead to reach the Sustainable Development Goals, evidences showed the impossibility to reach the agreed goals with the measures taken. Thus, the world leaders of the member states of the United Nations gathered in the SDGs Summit held in New York, from 21st to 23rd September 2019 in order to review the terms agreed. Eventually, they concluded that it was necessary to apply for a decade of action and results in favour of sustainable development. To undertake this labour, they agreed that it was required to activate the necessary funding so that the institutions of each nation could have the Goals fulfilled by 2030. In this summit, the Secretary-General of the United Nations, António Guterres, encouraged all the sectors of the society to join forces so they could work in a decade of action in three levels: Working together to secure greater leadership, more resources and smarter solutions for the SDGs; Local action: Embedding the transitions we need in the policies, budgets, institutions and regulatory frameworks of governments, cities and local authorities; and people action: Generating an unstoppable movement of youth civil society, media, private sector, unions, academia and more, all pushing for transformation.

As a result of this situation, the elaboration of an action plan that arises from the classrooms with a view to raise students' awareness without undermining the teaching of the subjects of the specialty chosen is imperative. In this way, echoing António Guterres's words, a group of teachers from the Department of Modern Philology of the University of Alcalá decided to create the Agenda 2030 Working Group¹, which was entitled

¹ As it is explained in the guide for groups creations of the University of Alcalá, the GTA2030 are conceived as stable collaboration entities between members of the university community and, where appropriate, between these and external entities organized around common lines and principles to promote initiatives and projects aimed at the SDGs development in the fields of own resources management, teaching, research and/or knowledge transfer.

«Promotion of the Sustainable Development Goals through Higher Education: Humanities and Social Sciences»². This research collects the difficulties found, as well as the solutions reached in the introduction of the Sustainable Development Goals in the teaching of the History of English-Speaking Countries subject which belongs to the degree in English Studies of the University of Alcalá, and which was taught from September to January 2020/2021.

2 OBJECTIVES TO ACHIEVE

Higher education institutions play a key role in order to fulfil the Sustainable Development Goals so, for this reason, they are integrating the SDGs into their academic syllabus (Lozano, et al., 2015). They can get closer to the students of any degree or field of study. Thus, it is relatively easy to reach every university student through the different approaches suggested by the 17 SDGs. As a consequence, higher education institutions have the duty of taking a leading role which helps to deeply change society and the perspective the SDGs have been approached so far with the purpose of developing and sharing ideas with future generations (Aktas, Whelan, Stoffer, Todd & Kern, 2015). According to Sustainable Development Solutions Network Australia/Pacific, «Higher education institutions are in a unique position in societies because they are neutral and trusted stakeholders within them» (SDSN, 2017, p. 8) This perspective is equally shared by UNESCO «The greening process has to be backed up by all relevant stakeholders on an institutional, national and global level (three-tier approach). For this purpose, close dialogue and cooperation between all actors of the education system is necessary» (UNESCO-UNEVOC, 2013, p. 7).

To pursue this purpose, a change that motivates cooperation between governments, organizations, institutions, departments and eventually professors is obviously essential. This is the reason why there is a need to modify the way lessons are taught and create the required tools to conduct this

² This is a translation made by myself due to the fact the original name is «Promoción de los Objetivos de Desarrollo Sostenible a través de la Educación Superior: Humanidades y Ciencias Sociales».

change in order to encourage students to support sustainability (Hoque, Yasin & Sopian, 2022).

Precisely, one of the main problems that has been spotted in the scientific literature is the lack of published results in the integration of the SDGs in Higher education institutions (Findler, Schönherr, Lozano, Reider, & Martinuzzi, 2019) Hence, this research gives the chance to implement the principles under the GTA2030 was constituted and draw the relevant conclusions of this research. Once this activity starts, its main aim lies in informing and, making students aware of the importance of SDGs in their own lives and in their future to come, which is even more significant. Thus, students are intended to get personally involved in the fulfilment of those goals and, by this means, start a real change that arises from the classrooms with a view to creating the necessary impact to reach the goals suggested in the 2030 Agenda. Therefore, this purpose is linked to the fourth goal and the professors' commitment to offer students a quality of teaching.

3. TEACHING METHOD

3.1 Setting

This research in a group of History of the English-Speaking Countries subject was conducted during the 2020/2021 academic year for the very first time and this is the reason why the quality of the results was strictly theoretical. To contextualise the starting point, 59 students aged 18-24 and who were in the first year of the degree in English Studies have taken part in this research. A remarkable fact is that two Erasmus students coming from England and France, as well as two students who studied primary and secondary education in foreign centres, specifically in Germany and the USA, have also participated in the research. Nonetheless, despite the fact that the context and framework where each of the students come from are heterogeneous, they all share a certain passion towards the English-speaking countries.

3.2 Approach

The integration of the teaching of the Sustainable Development Goals in the History of the English-Speaking countries subject implied making

changes in the approach of the teaching as it has been planned so far. The purpose of this process of teaching innovation required a series of adjustments in order to avoid that the incorporation of the SDGs was forced or, even worse, distorted the learning objectives that students should fulfil to consider the subject academically assimilated with regard to its assessment. Thus, «for education to be transformative in support of the new sustainable development agenda, ‘education as usual’ will not suffice. Learning should foster thinking that is relational, integrative, empathetic, anticipatory and systemic» (UNESCO, 2016, p. 34).

The teaching of any subject related to history is bound to be taught as lecture-based due to the existence of a certain level of initial unawareness by the students. This fact is even more significant when the subject does not relate to the history of the country where the students come from, as so is the case of this subject. Nonetheless, the traditional teacher-centred approach is not a particularly effective method in many occasions due to the fact that this kind of teaching is not appealing enough to many students, especially in the field of Higher Education. Consequently, a teacher-centred approach offers «a management system that orients students toward passivity and compliance with rigid rules undercuts the potential effects of an instructional system that is designed to emphasize active learning, higher order thinking, and the social construction of knowledge» (Brophy, 2006, p. 40). These are the reasons why this type of approach was rejected in favour of a more convenient one which could take advantage of the heterogeneity of the group to benefit from the opinions voiced in the sessions of debate. Hence, it was more evident that the proper choice was a student-centred approach, which fostered students’ active participation and critical thinking. Thanks to this type of approach, regardless of students’ ideas or opinions, the teaching of the SDGs could be adjusted to the focus of interest of any of them in an individual way and share it as a group, too:

Student-centered learning is effective for every member of the classroom, because it takes into account their diverse learning needs and greatly increases their retention of both knowledge and skills. Moreover, it emphasizes that learning requires active engagement by the students, so it works to engage students in learning. Students gain confidence in themselves as they take on new responsibilities. Student-centered learning enables students to

develop the necessary workplace skills. It encourages innovation and creativity through deep learning and requires students to think about their learning, and about the issues and the problems. The student learns to be responsible for his own learning and actions. The student learns about things and likes working with others, team building, developing skills and how to be independent. (Kutumba Rao, 2020, pp. 132-133)

The flexibility of this type of approach was notably beneficial in the case of this particular subject since it was contemplated for the first semester in the degree in English Studies. For this reason, students did not know each other previously and this subject helped them exchange opinions and create bonds between them.

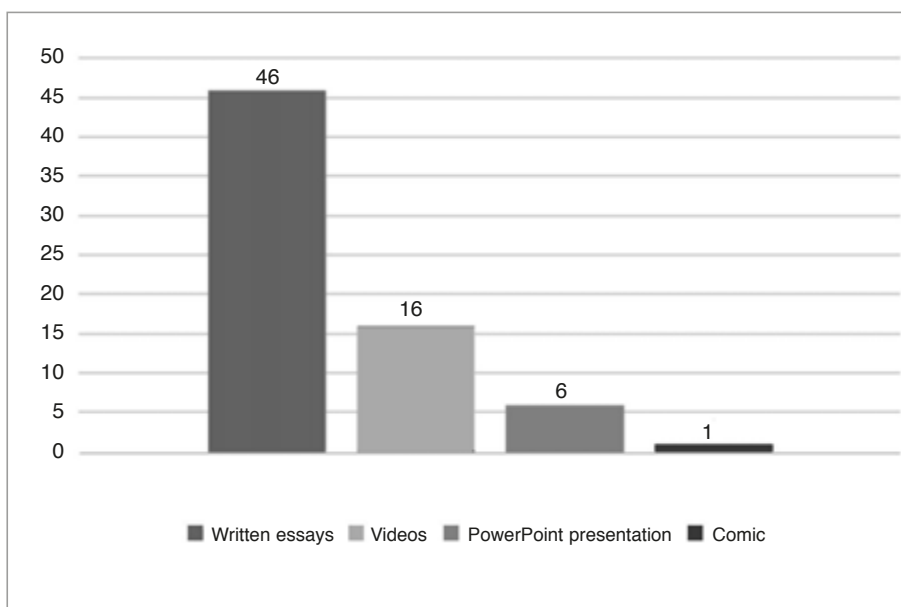
With the aim of including the Sustainable Development Goals in the lessons of history in a natural way, the teaching method followed was based on the implementation of workshops composed by modules of research and debate about the achieved knowledge, as well as their own experiences. To do so, a diachronic vision of the problems faced by the SDGs in the History of the English-Speaking countries was carried out during the lessons in order to establish the basis to make students understand that the origin of a historic problem affects them nowadays.

3.3 Assessment

The students were asked to elaborate an assessable research project in the last part of the academic year. The reason of this assessment method lays on «Project work gives students the opportunity to develop their strategies for tackling research questions and scenarios» (Race, 2009, p. 39). This project would worth the 10% of the final mark of the subject and it would work as the conclusion of the knowledge acquired during the semester. To elaborate the project, they were given complete form freedom. They were encouraged to be creative and express themselves as comfortably as possible about how one of the 17 Sustainable Development Goals has historically evolved in an English-speaking country and its projection into the future. They were previously told that the best contributions would be shared on the Twitter account of the GTA2030 as «Innovative Teaching incorporates technology in to teaching learning methods to create a rich learning experience for students

and a rewarding teaching experience for faculty» (Khairnar, 2015, p. 869). Moreover, research has shown that the use of technologies and collaborative learning improve the communication between students and faculties s (Laird & Kuh, 2005). When the deadline ended, the classification of the type of form chosen by the students to elaborate their SDGs Project was the following:

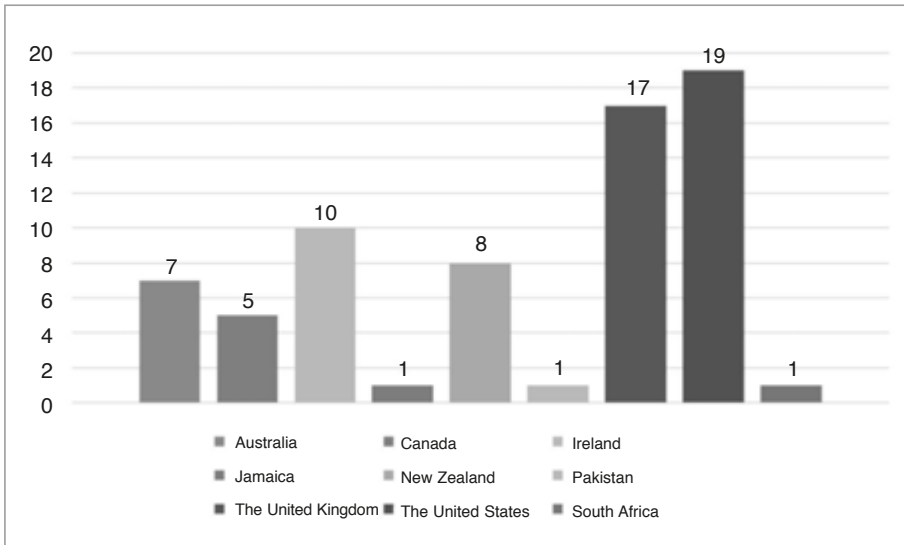
Figure 1
SDGs assessment classification



The range of the classification was 46 written essays, 16 videos, 6 PowerPoint presentations and a comic out of the 69 samples collected. In order to assess them, it was necessary to design a rubric which served as a central and egalitarian axis because of the heterogeneity of the samples received. The three items which regulate the assessment are: the veracity of the facts presented; the fulfilment of the suggested objectives; and the originality of the chosen topic.

Another remarkable characteristic to bear in mind after having analysed the samples of the projects is the students' choice of the countries in order to elaborate their research projects. The information collected can be observed in the graphic that follows:

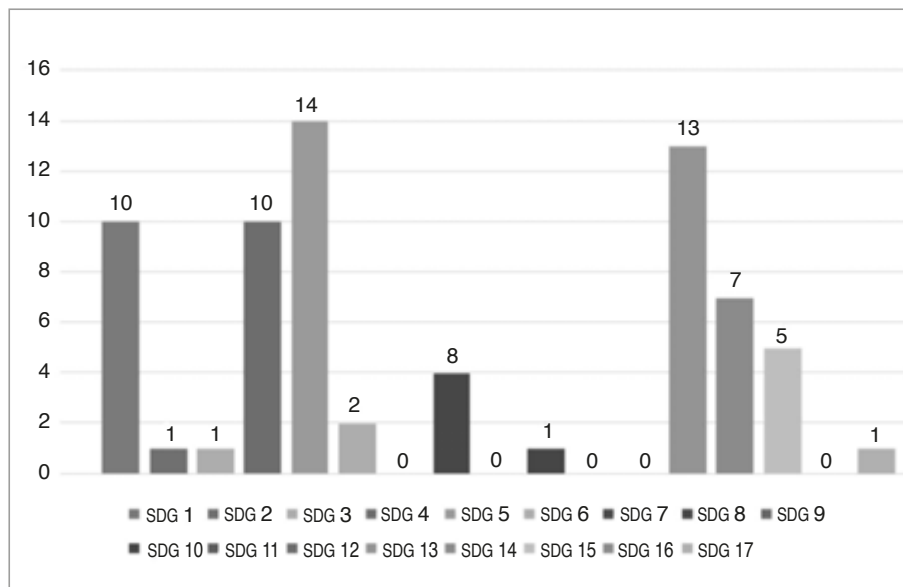
Figure 2
Countries chosen by the students



To base their projects on, students predominantly chose The United States (19), followed closely by United Kingdom (17) and Ireland (10). The fact of these three countries being the most popular ones among students was foreseeable to a certain extent. On the one hand, it is irrefutable that the first countries that come to everybody's mind when English-speaking countries are referred to are the USA and the British Isles, since these are the countries with the vast majority of English speakers. On the other hand, it is necessary to consider that, as they are students in their first year of university, their decision of studying the degree in English Studies has been based on their predilection for or bond with both the culture of some of the most well-known countries and the English language. It is worth stressing that such countries as Jamaica, Pakistan and South Africa were barely chosen by the students, with one student each.

Eventually, another analysable factor is the variety of the Sustainable Development Goals selected by the students in order to elaborate their projects. The information compiled is shown in the graphic that follows:

Figure 3
SDGs chosen by the students



The SDGs chosen by a greater number of students were Gender equality (14), Climate action (13), No poverty (10) and Quality education (10). The popularity of Gender equality among students was certainly reflected during the sessions of debate and this fact may have probably influenced on its selection. However, it is worth stressing that five SDGs were not represented by any of the students. In this case, Affordable and clean energy, Industry, innovation and infrastructure, Sustainable cities and communities, Responsible consumption and production and Peace, justice and strong institutions could not draw students' attention despite the possibilities of development when covering this range of issues.

4. CHALLENGES FOUND

When a plan to integrate the teaching of the Sustainable Development Goals to the History of English-Speaking Countries subject is established, three challenges or main problems can be found.

The first challenge consists in outlining a teaching plan that includes in a diachronic way the historic consequences which have created the necessity

of these Sustainable Development Goals with a special attention in the English-speaking countries. The reason of this specification is found in the fact that this is a subject in the degree in English Studies. The teaching of history sometimes causes what is known as a historical distancing among students. This concept is a metaphor to explain how people situate themselves between the past and present (den Hollander et al., 2011). It is common that professors find a lack of connection or incompatibility between the facts taught and the students, since they can neither sympathise with the events nor notice that our current reality is nothing but the consequence of those events. Nonetheless, this is not a new problem caused by current society. In fact, it is widely known by university lecturers and history teachers and historians in general, as Phillips states:

The idea of historical distance is hardly new. On the contrary, historians have staked a great deal on the idea that distance gives us the detachment we need to form a dispassionate view of the past. Indeed, this distinction between supposed objectivity and blind prejudice has often been seen as the divide between cultures that are capable of modern historical perspectives and those that are confined to religious or ideological irrationalism. But we need not press the question this far to recognize the ideological weight carried by the idea of distance — or the potential benefits that may come from liberalizing our conception of this powerful idea. (Phillips, 2015, p. 32)

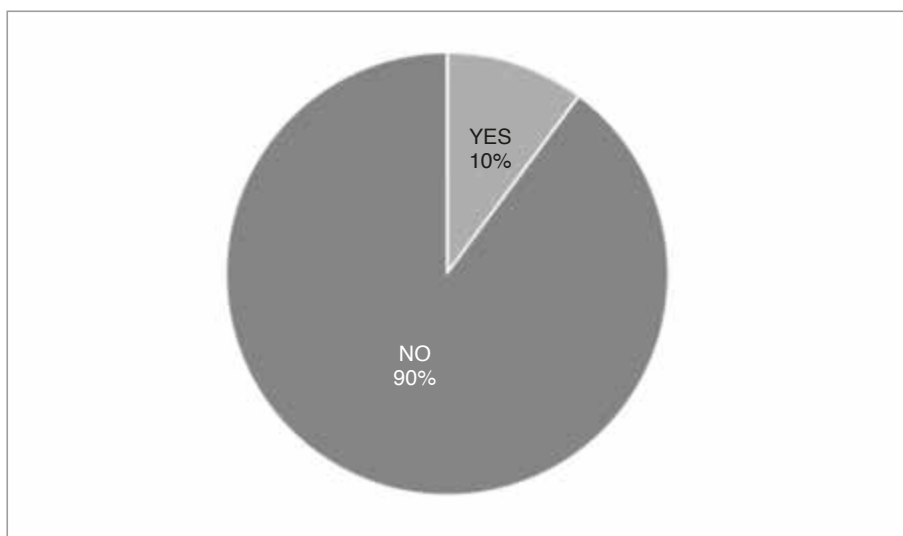
In order to solve the problem of distancing in the classroom, the association of the historicity of those Sustainable Development Goals to the topics with a recurrent presence in the society to which the students belong was required. To set a specific example in relation to the Gender equality goal, it was suggested a topic which was contemporary enough so that all of them could easily relate. Teaching was led to make them aware of the fact that the struggle for equal rights for men and women of the current Feminism is nothing but the consequence of the emptiness and apparent oversight of the relegated figure of women in the liberal state. It extends until the 20th century and it was firstly manifested by Mary Wollstonecraft, the author of *A Vindication of the Rights of Woman*, who reports the situation from a defending perspective, which is an essential part of Feminism. Students were taught the evolution of the Feminism movement, from the 1848 Seneca Falls Convention to the appearance of the first suffragists, led by Emmeline Pankhurst. This fact helped them to understand the intersec-

tionality which Feminism has evolved nowadays. This particular example leads them to know which the origins of such a current topic are and lays the foundation to substantiate it in a more critical way due to the fact they have already had a solid basis to build their reasoning.

The second challenge lies precisely in the creation of an atmosphere of communication and work between the students, which is comfortable and comprehensible enough, and which favours critical thinking and debate. The origin of this challenge arises from two points mainly. On the one hand, as this subject is taught in the first semester of the first year of the degree in English Studies, the students were immersed in the process of getting to know each other. On the other hand, they were originally inhibited when making voluntary or entirely subjective contributions under the fear of being judged. As a matter of fact, this fear or insecurity has been specially boosted due to the global pandemic of Covid-19, during which teaching in Spain was inevitably replaced to an online version, which resulted in evident lacks in the quality of teaching as well as a regression in sociability and a noticeable individualism in the students' character. If this fact alone was considered a potentially meaningful drawback to take into consideration, previous knowledge about Sustainable Development Goals was utterly decisive, as it can be observed in the figure below:

Figure 4

Students with previous SDGs knowledge



Thus, only 6 out of 59 students initially knew the existence of the SDGs. This large percentage of unawareness avoided precise communication and a sufficient degree of understanding to build solid ideas and well-founded opinions. On one hand, the SDGs knowledge problem was solved with a combination of lecture and the self-research in order to do the assessment task I have asked them as part of their final grade. On the other hand, the problem of the lack of participation was avoided with a selection of hot topics to debate in the sessions so that nobody could remain indifferent and they were willing to participate and share their own point of view. A meaningful example was found during the debates about the historic evolution of the LGTB rights. Some students raised their personal experiences defending the importance of a space in classrooms as well as the fact of being taught by members of the LGTB community. A student stated that «it is not necessary to be an ancient Roman so that the professor can explain how the Roman Empire's invasion in England was». Such comment generated a certain degree of controversy and it led to a debate about if it is really necessary to be a member of the collective in order to inform and make know the problems to achieve equality of rights. The selection of this debate in particular, as well as its development, attained students' involvement in an effective way which ended up creating the desired atmosphere of debate for the following sessions.

The third and last challenge is to integrate the results obtained by the students in the assessment process due to the heterogeneity of the samples received. Although the specific results found in the samples made by the students will be discussed hereinafter, I can anticipate that, as the students were free to use the format, they desired in order to set out their own conclusions, the creation of a specific and more flexible rubric to account for the quality of their contributions was needed. So, as it is mentioned before, the three items which regulate the assessment were the veracity of the facts presented; the fulfilment of the suggested objectives; and the originality of the chosen topic.

Most of these challenges could be foreseen during the subject planning and solutions to each of them could be anticipated likewise. Nevertheless, students' heterogeneity and the characteristic nature of the sessions of debate entailed a certain degree of dynamism and flexibility in the resources needed to prepare these sessions. Finally, every single challenge found could be

solved, which facilitated the satisfactory fulfilment of the objectives suggested at the beginning of the academic year.

5. CONCLUSIVE RESULTS

Once this research has concluded, a series of conclusions can be drawn from the analysis of the information obtained. The integration of the Sustainable Development Goals in Higher education is absolutely possible, but it requires a joint effort on the side of the institutions, organizations and professors. This effort will be futile if professors do not feel supported by the institutions and the latter do not grant the appropriate tool to execute their task. Likewise, educators need to commit to the integration of the SDGs in their teaching, without undermining the competences students have to acquire. Institutions must accomplish this deal so that students and, by extension, society benefits from this symbiosis. Higher Education Institutions must serve as knowledge lighthouses where students cannot only acquire information but also the tools to research and assimilate the necessary skills to make the world a more sustainable place:

Education for sustainable development aims at enabling everyone to acquire the values, competencies, skills and knowledge necessary to contribute to building a more sustainable society. This implies revising teaching content to respond to global and local challenges. It should also promote teaching methods that enable students to acquire skills such as interdisciplinary thinking, integrated planning, understanding complexity, cooperating with others in decision-making processes, and participating in local, national and global processes towards sustainable development. (HESI, 2021, p. 3)

Additionally, Higher Education Institutions can offer a wide range of branches of knowledge. Within its ranks, world-renowned researchers of every single known fields are found, which gives them the potential capacity of looking for new solutions and divulging their findings. This fact, apart from being a privilege, needs to be a responsibility that turns them into those nucleuses with the power of being the driving force that motivates the change towards a more sustainable society. This commitment is gathered in the SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. This duty might be complicated if profes-

sors decide to accept it in an individual way. This is the reason why the creation of working groups is very advisable since the joining of several professors who share the same goal will ease the change and will create a greater impact. This fact is translated into the possibility of reaching a bigger number of students who are ready to accept what it is agreed in the 2030 Agenda.

In the integration of the SDGs in the teaching of the History of the English-Speaking Countries subject, a change of approach to adapt to the specific needs has been convenient. As it dealt with first-year-students in the degree in English Studies, it was essential to foster students' participation and critical thinking in order to reach a greater degree of immersion and compromise with the SDGs. As a result, the traditional teacher-centred approach did not meet the requisites of this situation. A student-centred approach was followed instead and the results were very positive. Consequently, students' interest and commitment could be boosted thanks to a teaching which was guided to achieve students' participation and be geared towards their involvement in history. The students initially started as a group of people who had a certain common passion towards the English-speaking countries, who did not know each other and had little or no previous knowledge about the Sustainable Development Goals and their historic evolution. When the semester came to an end, the group of students had conveniently evolved, built ties among them and a basis to reason their ideas. Hence, it notably contributed to the creation of a critical thinking and an active attitude in the students.

The combination of different types of technology in the teaching of the subject has positively favour students' acceptance and the assimilation of the SDGs. Therefore, «teaching with technology engages students with different kinds of stimuli involve in activity-based learning. Technology makes material more interesting» (Khairnar, 2015, p. 869). It is notorious that students' involvement with the SDGs was awarded with the 10% of the final mark in the subject as long as the project was properly elaborated. Nevertheless, most of them were more thrilled by the fact that their contributions could be posted in the GTA2030 official Twitter account of the University of Alcalá. The use of social media introduces a dynamic relationship between students and their learning process as they include tools they use in their daily routine and those which are part of their academic, and consequently soften de lines among them (Rutherford, 2010).

Among the most used methods in the teaching of the subject, the sessions of debate were undoubtedly the most accepted ones by the students. Thanks to this type of strategy, a better degree of acceptance and sensitivity in students has been achieved. Furthermore, students registered their satisfaction with this type of teaching rating it with a 9.2 out of 10 in the anonymous survey of professors which is carried out at the end of the semester. The teaching of history usually generates a certain level of tedium among students due to the historical distancing and the impossibility of accepting that our current society is nothing but the consequence of those historical events which are explained throughout sessions. Nonetheless, the application of workshops to collect the necessary information which gave them the required tools to debate with well-founded arguments was a success when reaching the skills suggested at the beginning of the academic year.

Another remarkable result is the information obtained in the samples of the SDGs projects. Despite the fact that students had freedom of format to elaborate their projects, a vast majority of them chose the essay as the method to express themselves. Only 25 out of 69 students opted for a more visual option. The reason of it could be found in the habit of elaborating their projects as essays throughout all their lives as students as «in some subjects, assessment is dominated by essay writing (Race, 2009, p.80). The choice of the countries and the SDGs on which their projects are base is also noticeable. The USA and the SDG 5: Gender equality are the topics which concern most students. These results are an indicator of the concerns of a generation and, as a consequence, to direct the efforts towards that direction.

5.1 Limitations

The greater limitation of this research has certainly been the time. The teaching of History of the English-Speaking Countries only lasts a semester. If the mere fact of compressing all the history of these countries in only six months is a hard task, being able to induce the SDGs in the syllabus without distorting the teaching of the subject is a challenge. Having a whole academic year to teach the subject would have given more possibilities of delving into certain topics and covering others which, due to this lack of time, were rejected during the planning of the teaching. A solution that

could help would be receiving an education about Sustainable Development Goals throughout their preuniversity education due to the fact that most students were unaware of their existence at the beginning. Thus, sessions could be better leveraged since students had well-founded information of the SDGs.

Another limitation derived from the teaching lies in the assessment. Although the results of the research have been positive, it is still wondered until to which extent the fact that the samples received have been the consequence of a requirement to pass the subject has influence on it. Hence, a valued idea is to set the assessment of this innovation project out to the students as optional, whose only award was to post them in the social networks of the GTA2030 and, by this means, to give them visibility in an academic platform.

Finally, in order to measure the impact of High Education Institutions on the SDGs it would necessary to discover what is already being done (Calles, 2020) and it would essential for the evaluation, follow-up and attainment of the SDGs (Choi et al., 2016; Gusmão Caiado et al., 2018).

5.2 New Avenues

The results of this research have been both positive and satisfactory. This is the reason why new avenues arise when this activity is planned to be repeated in the years to come. One of the facts that students have emphasised is their enthusiasm when combining teaching and social networks. Nowadays, the most famous social networks among students are TikTok, BeReal and Instagram, and in the case of the first one, it has become the most popular of the social media platforms (Brooks, 2021). All these platforms share the possibility of being more visual, as they prioritise the sharing of images and videos. Nonetheless, these use of these three social media platforms have been taken in less consideration than Twitter in relation with its educational potential (García-Suárez & Trigueros-Cervantes, 2015) The use of one or more social tools could be used to engage students' interest, and subsequently the spend more quality time on their academic activities (Kennedy, 2000). The dynamism is one of the main characteristics of these social media, so it allows to students to become active participants instead of passive consumers (McLoughlin & Lee, 2007). As the GTA30, we decided to extend our radius of action to these platforms in

order to arouse a greater interest among students and, ultimately achieve that a bigger number of people are informed and cooperate to reach the goals of the 2030 Agenda. The adaptation of these new learning experiences will help to address the necessities of today's learners (Baird & Fisher, 2006; Christensen, Horn, & Johnson, 2008) as students are the future leaders and legatee of technology (Leal Filho, et al., 2018).

Other new avenues come from the possibility of modifying some of the topics raised during the sessions with a view to drawing students' attention to those SDGs with a lower popularity in the light of the samples received, such as the SGD 8: Decent work and economic growth or the SDG 16: Peace, justice and strong institutions. By this means, the problems which seem to catch less attention from the new generations could be voiced. This fact becomes really important due to the fact all the SDGS are inter-connected and it is not possible to achieve one without achieving the others (Egron-Polak, 2016). The results reached in this research are considered to be a resounding success and it is positively valued the repetition of this teaching innovation project in the academic years to come the repetition of this teaching innovation project in the academic years to come is positively valued.

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RESEÑAS

LIBROS

Cultura ingobernable

BEIRAK, J. (2022).

ARIEL. 222 PÁGS.



La obra es un ensayo que pretende pensar el futuro de la cultura y hacer consciente a las élites políticas gobernantes y al ciudadano medio de que esta puede cambiar el mundo, y de que puede estar siendo escenario de la radicalización democrática.

En la actualidad la cultura goza de un amplio crecimiento, pero al mismo tiempo de una baja estima y de una cierta indiferencia, nos viene a decir la autora. Parece relegada a un mero acto de consumo, en vez de convertirse en espacio de creación y comunidad. De ahí el intento de hacer frente a este devenir para situarse en la actualidad delante la cultura no como consu-

midores sino como agentes que potencian los espacios cotidianos y que buscan recuperar las dimensiones olvidadas de la misma.

La autora reconoce que el concepto de cultura es uno de los más «escurridizos» que existen. Las definiciones más científicas que del término se han ido dando desde mediados del siglo xx (Kroeber-Kluckhohn, Moles, etc.) han ido reivindicando elementos olvidados de la misma, pero ciertamente con el paso del tiempo los subrayados han sido diversos: «Podría decirse que cada época ha tenido sobre el arte y la cultura la misma mirada que ha tenido sobre sí misma. En la Edad Media, por ejemplo, se subrayaba su conexión con lo divino; durante la Ilustración, con el orden, la razón y la civilización; durante el siglo xx se conceptualizó como un espacio de conflicto inconsciente y, en la posmodernidad, como una multiplicidad de relatos. Si fuera cierto, como se ha dicho a menudo, que hoy la cultura se entiende como comunicación, podría ser esa la clave para explicar el hecho de que, actualmente, la participación se halle cada vez más en el centro de los debates culturales» (p. 15).

Tres serían los debates principales en la actualidad sobre la cultura: el primero, gira en torno a la cultura como algo centrado en el campo de las artes o como algo que puede extenderse a los modos o formas de vida. El segundo sobre cultura como industria o como algo que pertenece al ámbito de los derechos ciudadanos. Y, finalmente, el debate en torno a la alta cultura y la cultura popular.

La obra cuenta con un preámbulo, seis capítulos y un simpático epílogo donde la autora hace una especie de autobiografía desde la perspectiva de su relación con la cultura. Creo que es un elemento más a tener en cuenta que le da al ensayo un valor más aquilatado.

Jazmín Beirak Ulanosky nació en Madrid el 2 de diciembre de 1978, hija de exiliados argentinos. Licenciada en historia y en teoría del Arte, trabajó como investigadora en la Biblioteca Nacional de España y ha escrito de política cultural en diversos medios nacionales y extranjeros. Actual-

mente es responsable de cultura de Más Madrid y diputada portavoz de cultura en la Asamblea de Madrid desde 2015.

Podríamos señalar finalmente que la obra, el ensayo de Beirak, es fundamentalmente un alegato por una cultura abierta, instrumento de emancipación y transformación social: «es necesario armar una defensa de la cultura que, por un lado, rompa con la lógica autorreferencial que suele regir en las entidades oficiales e institucionales y, por otro lado, que aspire a ir más allá de las demandas sectoriales y profesionales concretas. Es necesario un movimiento que defienda, cuide y promueva la cultura como bien común y como patrimonio colectivo... Así pues, es necesario reconocernos, conectarnos y comenzar a pergeñar una pequeña revolución cultural. Con ese movimiento en ciernes está en deuda este libro y a él espera en alguna medida poder contribuir» (p. 184).

José Luis Guzón Nestar.

Nadalízate. Aprende del mejor deportista español de la historia cómo sacar lo mejor de ti

CUBEIRO VILLAR, J. C., y
GALLARDO, L. (2023).

ALIENTA EDITORIAL. 176 PÁGS.



Se trata de un libro que describe el proceso que ha seguido Rafa Nadal desde sus inicios como tenista en Mallorca hasta sus últimas conquistas, repasando el currículum deportivo, pero matizando, también, aquellos momentos de dificultades que han podido surgir y relacionándolo con los conceptos de pasión, misión, vocación y profesión que los autores establecen como inicio de la inspiración personal. Lejos de ser un libro meramente de recorrido de un currículum profesional, relaciona los éxitos deportivos con los valores, aspectos de personalidad y hábitos que aproximan al éxito.

En la primera parte se explica el concepto del dialogo interior que se establece en cada persona y como este es, fundamental, para alcanzar los objetivos deportivos, al igual, según los autores, que en la vida en general, de ahí que nos recalquen que sea positivo y parta de valores como la humildad, pero buscando el crecimiento y la superación continua permanentemente.

Se ponen de manifiesto, también, la capacidad para tener una meta y saber que se está destinado a lograrla, con valentía, serenidad, coraje, templanza, justicia y equidad, sabiduría y educación y a la vez siendo generoso con uno mismo y con los demás, valorando el esfuerzo propio, pero teniendo la capacidad de reconocer en el adversario deportivo el mérito del esfuerzo y el nivel que a su vez repercute en el de uno mismo en cuanto a que de la calidad del adversario determina cual debe ser la de uno mismo para intentar superarlo.

En la segunda parte se presta más atención al concepto «hacer equipo», Sin duda, constituye un apartado novedoso, porque refiriéndose al tenis (deporte individual), deja claro que, aunque el triunfo se circunscribe a un solo deportis-

ta, para alcanzar la victoria hay un equipo entero detrás que contribuye a ella, desde la multidisciplinariedad, y lo importante que es tener cerca a las personas que pueden «nutrir» ese equipo y en su debida distancia al resto de personas (seguidores, etc.). Por supuesto, la importancia de hacer un buen equipo se basa en que el equipo tenga la misma ética de trabajo y todos guiados por los valores de la confianza y el compromiso.

La tercera parte recoge la importancia de ser positivo en cuanto al auto convencimiento de la consecución de los objetivos (hay que verse a uno mismo consiguiendo el objetivo), imaginarlo para poder conseguirlo y que del interior (de las ganas de uno mismo) salga la motivación para hacerlo. Estos detalles pueden marcar la diferencia entre llegar o no al objetivo junto con una fuerte creencia en la «cultura del esfuerzo» como medio para conseguir los logros.

En la cuarta y última parte, ponen el foco en la importancia que tiene, cuando ya la experiencia lo permite, utilizar la intuición, el pensar rápido, pero también el estar acostumbrado a adaptarse a circunstancias duras y cambiantes y a anticiparse a los demás.

En resumen, un libro en el cual se utiliza la figura de un deportista legendario para explicar desde el punto de vista de la relación entre las actitudes y la lucha por conseguir los objetivos que uno se marca, una trayectoria impecable en lo personal e inigualable en lo profesional.

Luis Pascual.

Nebrija. El sabio que amaba las palabras

RIERA, A., y DEL AMO, O. (IL.).
(2022).

EDITORIAL PLANETA. 64 PÁGS.



«¿A qué viene lo de escribir un libro sobre Nebrija?» Con esta pregunta, Ana Riera nos introduce en la historia de esta gran figura del humanismo. *Nebrija. El sabio que amaba las palabras* es un libro idóneo para los primeros ciclos de primaria, tanto por su lenguaje claro y expresivo, como

por sus múltiples y coloridas ilustraciones. En él, se realiza un amplio repaso por la vida del humanista andaluz desde su nacimiento. En este punto, cabe señalar como aspecto muy positivo el hincapié que hace la autora en la infancia y los primeros estudios de Nebrija, lo cual permite una mayor identificación de los niños con una figura que, de otro modo, quizá les resultaría algo ajena.

Conforme avanza la lectura, asistimos al resto de hitos vitales del humanista: su faceta de docente y educador, desempeñada en numerosos y diversos lugares, y también su importante labor como investigador. Además de su férrea defensa del latín, que trascendió las aulas de la Universidad de Salamanca –donde impartía sus clases– gracias a su *Introductiones Latinae*. Y, también, como no podría ser de otra manera, su *Gramática de la lengua castellana*.

Durante toda esta lectura, el texto principal aparece acompañado de cuadros y apartados de los que la autora se sirve para explicar a los pequeños lectores algunos conceptos y datos importantes: el humanismo, los mecenas, la función de las gramáticas o la invención de la imprenta entre otros.

Gracias a ellos el texto se vuelve mucho más claro y educativo sin perder fluidez y dinamismo. Un dinamismo que, además, es reforzado por las numerosas preguntas retóricas que buscan mantener la atención plena de los niños, así como por las constantes exclamaciones, que aportan una mayor expresividad a la narración, y por la alternancia de un registro formal con colocaciones y coloquialismos cercanos a la oralidad.

Nebrija. El sabio que amaba las palabras cierra con algunas curiosidades y reflexiones en torno al castellano, relacionando cuestiones históricas con asuntos de total actualidad, algo que, por otra parte, encontramos a menudo durante su lectura y que, bajo nuestro punto de vista, enriquece enormemente el texto. Así, Nebrija aparece descrito como «un gran tuitero de su época» por su gusto por los juegos de palabras y las guerras dialécticas. Afirmación acompañada por una divertida ilustración en la que Nebrija y sus coetáneos manejan *smartphones* con gran naturalidad. Un ejemplo muy claro de cómo este texto se articula como un diálogo constante con los jóvenes que busca despertar su interés y saciar su curiosidad mediante los vínculos entre el

pasado del humanista y la realidad del presente en el que vivimos. Las ilustraciones de Óscar del Amo, coloridas, expresivas y cargadas de humor, no hacen sino reforzar estos constantes guiños a los lectores y convertir este *Nebrija. El sabio que amaba las palabras*, en un libro más que recomendable por su gran valor educativo.

Concepción Martín Huertas.

Déjalos ser niños. Una guía práctica para acompañar a los pequeños en una crianza respetuosa

ESTREMER, L. (2022).

EDITORIAL PLANETA. 256 PÁGS.



La lectura de textos que orbitan alrededor de las pautas educativas y de crianza, de las formas de intervenir, de acercarnos a las

diferentes etapas de crecimiento de nuestros alumnos o hijos, escuchar otras voces y mirarnos en otros espejos... nos mantiene, tanto a madres y padres como a profesores, activos, despiertos, renovando y revisando nuestros propios planteamientos y nuestra manera de relacionarnos con niños y jóvenes...

Ésta que nos ocupa hoy, una guía práctica especialmente indicada para niños de Educación Infantil y si acaso primeros años de Primaria para cuestiones muy específicas, que nace de la mano y sobre todo de la experiencia en primera persona de Laura Estremera, resulta un material interesante, quizá no especialmente revelador o innovador, pero sí certero y útil, y desde luego creíble en tanto que es el fruto de su propia experiencia. Se suma a la literatura que aborda cuestiones de crianza, desarrollo y educación, pero pone el foco de atención especialmente en el protagonista, en el destinatario de nuestra intervención educativa. Se trata del resultado de un esfuerzo por comprender «desde dentro» la manera de procesar y percibir de los niños: no sólo cuáles son sus características según su etapa de desarrollo o cuestio-

nes similares, sino sobre todo sus necesidades principales, y la manera de generar experiencia y aprendizaje. Desde la lactancia y el apego, pasando por la gestión de emociones, el desarrollo neurológico, motriz, esta guía trata de dar respuesta a las cuestiones fundamentales de la etapa de Educación Infantil. De esta manera, hay también una voluntad tácita en su redacción, la de resituarnos a los adultos como acompañantes y facilitadores, catalizadores, potenciadores, devolviendo el protagonismo a quién por derecho le corresponde, que es al niño. Y si el protagonismo lo tiene precisamente la infancia, el niño, lo que aquí se plantea no es patrimonio exclusivo del marco doméstico, o del académico, sino más bien de todos los espacios que habitan los niños: la casa, la escuela, el parque como lugar de ocio socializador, etc.

Quien está detrás de este texto cumple un perfil profesional poliédrico tremendamente enriquecedor. Laura Estremera reúne la practicidad y el dinamismo propio de la formación profesional como Técnico en Educación Infantil, y lo enriquece con el soporte teórico más academicista y técnico, e igualmente enfocado en la intervención educativa, desde su for-

mación como Maestra de Audición y Lenguaje, y Psicomotricista, aportándole además la perspectiva terapéutica desde su conocimiento y experiencia como psicóloga, especialista además en los procesos de duelo infantil y de estimulación temprana. Apasionada –no lo oculta, sino todo lo contrario– de las metodologías activas, ya nos ha hecho referencia en anteriores publicaciones, como *Criando*, y *Ser niños*, y en la actualidad está recibiendo formación sobre el método Pikler del movimiento libre de los niños, y que reseña especialmente en su cuarto epígrafe.

La estructura que ha elegido para su exposición obedece a cuestiones muy razonables: 1. ¿Cómo somos? ¿De dónde venimos? Conociéndonos. 2. ¿Cómo nos desarrollamos? 3. Acompañar. 4. ¿Cómo aprendemos? 5. Una escuela vivencial. Cada uno de los capítulos finaliza con un texto sintético que condensa las ideas principales, y aunque las ilustraciones no son muy abundantes, porque en cierta forma no son tan necesarias para comprender la idea de cada texto, sí resulta interesante el archivo de imágenes que se adjunta al final, varias páginas a color con fotografías de su trabajo de campo que ilustran el desarrollo del dibujo en

los niños, el juego simbólico en salas de psicomotricidad, trabajos con materiales naturales, que sirve de estímulo para el desarrollo en la infancia, creaciones con barro y diversos materiales que favorecen precisamente el aprendizaje por experimentación desde la propuesta de escuela vivencial. Desde nuestra revista, os deseamos una lectura provechosa. Que sea acicate y semilla de nuevas experiencias e ideas para compartir en el futuro.

Israel Iglesias Huerga.

Los valores humanos de la España poscovid

FERNÁNDEZ ASEÑO, J. A.
(2022).

UNIÓN EDITORIAL. 218 PÁGS.



Los valores humanos aplicados a nuestro tiempo, como ejercicio de vivencia axiológica actual y res-

puesta a la problemática de nuestra convivencia diaria, tal y como hemos aprendido desde la incertidumbre y lo inesperado en la experiencia COVID, es uno de los objetos y fines de esta obra. Además, da a conocer escritos que nos acercan a la persona de D. José María Méndez a quien se hace homenaje con este libro.

La obra editada por José Antonio Fernández Ajenjo en Unión Editorial como parte de Monografías, cuenta con la aportación de sus compañeros de viaje, a partir de reflexiones en relación con sus enseñanzas, doctrinas y aplicación de los valores humanos contemporáneos que nos acercan a «lo útil, lo bueno, lo bello y lo santo».

D. José María Méndez como filósofo, reflexionó sobre los fundamentos de la Axiología o Filosofía de los Valores mediante libros, conferencias, cursos, etc., explicitando los grandes valores éticos como el respeto, la justicia y el autocontrol y aquellos en los que se subdividen. Como sacerdote, supo armonizar los valores desde su vivencia.

El editor José Antonio Fernández Ajenjo es doctor en derecho administrativo por la Universidad de Salamanca, donde investiga y colabora y académico de la real aca-

demia de jurisprudencia y legislación. Colabora con la Agencia Estatal del Consejo Superior de Investigaciones y el Servicio Nacional de Coordinación Antifraude del Ministerio de Hacienda, aportando su experiencia en el campo de la ética pública. Por su parte, los coautores, como profesionales vinculados a la Filosofía, el Derecho, la Educación, el Periodismo, la Pedagogía, la Filología, Axiología, etc., avalan la obra por su trayectoria, producción literaria y contribución con su texto cooperativo.

La obra comienza con un Exordio como introducción que dispone el ánimo del lector ante la persona de D. José María Méndez de quien el editor destaca su profesionalidad y dedicación a la Axiología y Filosofía de los Valores a través de sus producciones y la Asociación Estudios de Axiología, lo que invita a acercarse a la obra de José María Méndez.

El libro se divide en tres partes. La primera sobre la maestría en valores humanos de D. José María Méndez para la España poscovid. Aquí se desglosa en cuatro capítulos de varios autores que tratan las diversas enseñanzas espirituales, pedagógicas, filosóficas, políticas y axiológicas del homenajeado. La segunda, en torno a las claves de

los valores humanos de la España poscovid, donde otros coautores le homenajean destacando tópicos axiológicos, educativos y el sentido de la vida, entre otros. Finalmente, y a modo de cierre, se ofrece el ejemplo valioso de Salvador Martínez de la Asociación Estudios de Axiología.

La obra es un compendio de autores y compañeros de J. M. Méndez, que además de enfatizar su figura como agradecimiento y merecido homenaje, se enfatizan las enseñanzas de todo tipo, donde se engarzan los valores éticos que Méndez ha propuesto a lo largo de su actividad profesional, académica y religiosa. No sólo la España poscovid tiene que aprender de la vivencia coherente de Méndez y su propuesta de valores éticos, sino también el resto, como aval que redimensiona la perspectiva axiológica en el vivir humano, educativo y filosófico, y también, en la organización empresarial responsable, ética, eficiente y sostenible. Motivos que inducen a leer la obra para aprender y tomar referentes de formación y calidad, de quienes han ido dejando huella en nuestra diversa sociedad poscovid.

Para quien hace esta reseña, profesor universitario de educación en valores, la obra es un especial refe-

rente por todo lo dicho y, además, como producción de expertos en la materia, que sitúan y dan a conocer con sus reflexiones y aportaciones, la dilatada producción axiológica y filosófica de Méndez, en concreto su acreditada tabla de valores éticos.

Por todo lo expresado desde el contenido del libro, se trata de una obra, que además de homenajear al compañero, se ofrece formación y enseñanza sustancial para los que seguimos el viaje poscovid iniciado por D. José María Méndez.

Fernando González Alonso.

Un verano en Portugal

GUTIÉRREZ, P. (2023).

EDEBÉ. 132 PÁGS.



Pablo Gutiérrez fue seleccionado por la revista *Granta* como uno de

los mejores narradores jóvenes en español, cuando apenas había publicado su primera novela, *Rosas, restos de alas* (La Fábrica, 2008), que recibió el premio Tormenta al mejor autor novel. Posteriormente, fue galardonado con el Premio Ojo Crítico de RNE por la novela *Nada es crucial* (Lengua de Trapo, 2010), obra que fue traducida al francés y al italiano. Desde entonces, no ha dejado de publicar sus obras (*Democracia*, 2012; *Los libros repentinos*, 2016) con gran éxito, mientras imparte clases, da conferencias y participa en mesas redondas. Su primera novela pensada para el público juvenil especialmente fue *Memoria de la chica azul* (2021). Con *El síndrome de Bergerac* (2021) no solo se ha alzado con el Premio Edebé de Literatura Juvenil, sino que ha querido rendir todo un homenaje a sus alumnos.

Manu, Nora, y su familia deciden irse de vacaciones a Portugal alquilando una casa en la playa, en Praia Vermelha. Pronto, los dos hermanos van descubriendo un mundo alrededor: el chalet de al lado (los Aldermann, Hans y Stephanie y sus hijos Marco y Joel), Colin, el que tiene el negocio de bicicletas, O Zé, el restaurante, la playa; Fiona, la bruja

que no era tal. El autor nos transmite con maestría la fantasía de estos chicos, su sensación de libertad... nos hace disfrutar de la amistad que comparten con sus amigos (Marco, Joel, Colin, Nos... el pescador, la guardinha (policía)), la amistad perdurable de estos dos jóvenes (Manu y Joel) y la misma experiencia del viaje de vacaciones, tanto a la ida, como a la vuelta.

21 pequeños capítulos en que se narra una historia muy bonita, con frescura, agilidad, una historia que engancha también a los adultos.

José Luis Guzón Nestar.

El cerebro y la mente humana. Cómo son y cómo funcionan

MORGADO BERNAL, I. (2023).

EDITORIAL ARIEL. 256 PÁGS.



El profesor Morgado hace uso de su experiencia docente para expresar de forma didáctica, clara y científica los contenidos de un saber complejo, que solo los que lo dominan en profundidad son capaces de hacer asequible al lector, sea o no especialista en el tema.

El cerebro y su relación con la mente es un tema clásico, pero también de gran actualidad y popularidad tanto en el campo de la investigación y la docencia, como de la divulgación científica. Las neurociencias están presentes en todos los ámbitos de las llamadas ciencias biológicas y de la salud, así como en las sociales y educativas, en el caso de estas últimas, muy pujantes en la actualidad, se traducen o plasman en disciplinas como la Neurodidáctica, Neuroeducación, Psicobiología de la Educación, Neurociencias Educativas, entre otras. Es por ello que se encuentran insertas en los planes de estudio de diversos estudios Grados y Master. La separación entre los aspectos biológicos, psicológicos y educativos de la conducta son afortunadamente ya de otra época.

En un libro que calificaría de breve, poco más de doscientas páginas, hace un recorrido amplio, muy actual y claro, por las temáti-

cas clave y de mayor interés en el campo de la neurociencia.

En capítulos, en ocasiones de cuatro páginas, es capaz de sintetizar, dando respuestas claras, aunque no siempre es posible que definitivas, a temas tan complejos y controvertidos a lo largo de la historia de la ciencia como qué es la mente, la consciencia y la autoconsciencia y la relación entre las mismas. Como nuestro cerebro nos posibilita la realización de múltiples acciones automáticas, que pronto superará la inteligencia artificial, pero también otras como el hecho único en la especie humana de ser conscientes de nuestra existencia, y por ello tener que dar cuenta y razón de por qué vivimos y para que vivimos. Sin dar algunas respuestas a esas cuestiones existenciales la persona humana, como unidad psico-biológica, físico-mental, sentirá esa falta de sentido o vacío existencial del que ya nos hablara Víctor Frankl.

Analiza los mecanismos sensoperceptivos para el conocimiento del mundo que nos rodea; los circuitos de recompensa y el papel de sustancias como las endorfinas y las encefalinas en la reducción del dolor o en el placer físico e intelectual. Unas nos motivan para vivir y otras nos llevan al desaliento.

Describe el funcionamiento activo del cerebro mientras dormimos para integrar los recuerdos o para soñar. El papel de la homeostasis para la supervivencia, o los incentivos como el sexo, mediados por variables emocionales y sociales complejas que no se dan en otras especies y que nos permiten integrar razón y emoción, una emoción que nos facilita o dificulta el aprendizaje, el recuerdo o el olvido. Nuestros procesos mentales de ver, escuchar, hablar o soñar se revisten de un cierto color o tono afectivo, gracias a la actividad de estructuras como el sistema límbico y la amígdala cerebral. Los procesos pueden alterarse, activarse o inhibirse, funcionar a un nivel inconsciente o mientras dormimos, sin que la mente deje de trabajar. Aún inconscientes (por una anestesia) no perdemos la mente, el cerebro sigue activo.

Dedica un capítulo especialmente amplio al tratamiento de la sexualidad humana «el incentivo supremo», en sus diversas e intrincadas manifestaciones y variantes afectivo-emocionales, y otro las pequeñas diferencias existentes entre el cerebro del hombre y la mujer.

Se trata de un abordaje ameno, pero no ausente de una gran finura conceptual, y actualidad científica

en cada tema. En cada avance se muestra un nuevo horizonte de saber y nuevas preguntas que invitan a la búsqueda de respuestas. Nos muestra el exclusivo potencial del lenguaje humano como palanca para el desarrollo de la inteligencia (o más bien de las inteligencias múltiples y variadas), y los avances culturales y científico-técnicos, señalando las principales estructuras implicadas en nuestro encéfalo, como órgano de representación del mundo tanto externo como interno.

En los últimos capítulos muestra el papel de la evolución, la herencia, el ambiente educativo y las condiciones de vida en el desarrollo de nuestras capacidades. Finaliza con una breve información sobre las patologías neurológicas y su conexión con las enfermedades mentales, agrupa dichas patologías neurológicas en dos grandes grupos, las que afectan a la motricidad y las que afectan a la mente. En apenas cinco páginas sintetiza las causas, síntomas y tratamiento de cerca de diez de ellas. Los límites de la mente, concluye, son los límites del cerebro. El gran poder de cerebro y la mente humana es la capacidad de construir un mundo mejor, utilizando nuestra razón y emoción con el propósito de mejorar el bienestar propio y ajeno.

Es de agradecer, en un libro divulgador como este, el glosario de términos que aporta. Como nuestro autor sostiene, la ciencia no puede quedarse en los manuales académicos, debe poder llegar, sin renunciar a su carácter científico, a cuantos tengan inquietudes culturales.

Se trata de un manual de lectura fácil y amena, que puede ser de interés para cuantos nos dedicamos a la docencia en el campo de la Psicobiología y una herramienta de apoyo para nuestros alumnos, una oportunidad para despertar y abrir sus mentes, una fuente de inspiración para la investigación en las múltiples temáticas que desarrolla. El alumnado actual, tan acostumbrado al estilo de comunicación de las redes, a las noticias breves, a los vídeos de escasos minutos, puede encontrar en este libro múltiples focos de interés en el campo de las neurociencias, tratados con la concisión y amenidad a la que acostumbran, que así les impulsen a investigar, a descubrir más, a profundizar en cada tema.

Solo felicitar al profesor Morgado y desearle mucho éxito en la divulgación de su obra. Espero que tanto profesores, alumnado o público en general profano en la materia, sepan valorar y dis-

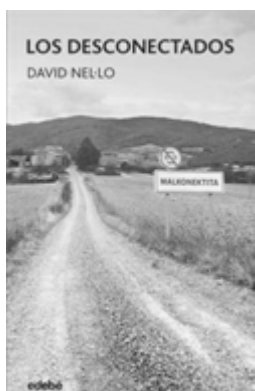
frutar de este regalo que nos permite saber algo más sobre quienes somos.

Luis Ángel Velado Guillén.

Los desconectados

NEL·LO, D. (2023).

EDEBÉ. 144 PÁGS.



En medio de un mundo hiperconectado, *infectado* (por la abundancia de mala información), no todo el mundo sigue el *mainstream*, sino que hay gente que decide conscientemente ponerse a un lado y dejar que esta sociedad de la información y la comunicación siga extendiendo su contagio a quienes quieran.

Es verdad que sustraerse a la esta sociedad hipertecnológica no es fácil. Hay cosas que nos han facilitado tanto la vida, pero, por otro lado, no cabe duda que la técnica

y la tecnología (especialmente las de la comunicación) nos complican enormemente la vida. ¿Qué hacer? No es ciencia ficción pensar en grupos que se retiran a una vida menos tecnológica e informática. Ya hay grupos. También los hubo en el pasado y que siguen en la trayectoria elegida. Bastaría pensar en los grupos Amist, de Pennsylvania Dutch, que tienen a gala, en algunos casos, vivir sin ningún tipo de tecnología, y en otros de disfrutar de los mínimos tecnológicos.

El autor es David Nello Colom (Barcelona, 1959), ya conocido por alguna obra anterior. Publicó su primer libro *L'Albert i els menjabrossa* en 1994, hace exactamente veinte años. Desde entonces ha escrito más de treinta libros para lectores pequeños y mayores. Así mismo, su mérito literario ha sido reconocido con numerosos premios. Muchas de sus obras están situadas en otros países, fruto de sus estancias en el extranjero. Actualmente vive en Barcelona donde sigue escribiendo y traduciendo.

En quince capítulos nos narra la visita a Malkonektita: «¡Atención! Habéis entrado en una zona sin cobertura. Os acercáis a Malkonektita. Una buena metáfora que

sin duda hará pensar a nuestros jóvenes y a quienes se encuentren más dependientes de las nuevas tecnologías».

José Luis Guzón Nestar.

El amante polaco

PONIATOWSKA, E. (2022).

SEIX BARRAL. 904 PÁGS.



Elena Poniatowska (nacida en París en 1932) es una escritora, activista y periodista mexicana. Es descendiente del último rey de Polonia, Stanislaw Augusto Poniatowski, que reinó a finales del siglo XVIII. Elena emigró a México a los diez años, junto con su madre y su hermana Kitzia, huyendo de una Europa devastada por la Segunda Guerra Mundial. Su madre, Paula Amor de Ferreira Iturbe, fallecida en marzo de 2001 a los 92 años,

fue mexicana afrancesada, cuyos antepasados abandonaron México después del fusilamiento del emperador Maximiliano. Nacida en Francia, doña Paulette conoció a su futuro esposo, el príncipe Jean Evremont Poniatowski Sperry, durante un baile en París y se casaron poco después, en 1922. Del matrimonio nacieron tres hijos: Elena, Kitzia y Jan.

De vuelta a México, Poniatowska estudió taquimecanografía para después trabajar como secretaria bilingüe, pero nunca hizo el bachillerato. Según ella, no se acercó a la universidad, aunque ha recibido varios doctorados honoris causa de universidades de México y del extranjero. Como joven periodista, son famosas sus entrevistas a grandes personajes como Luis Buñuel, Octavio Paz, Diego Rivera, Juan Rulfo o André Malraux.

Elena Poniatowska es autora de más de cuarenta libros que abarcan casi todos los géneros: entrevista, cuento, teatro, crónica, testimonio, novela, ensayo y biografía. En esta extensa novela (900 páginas), que bien puede considerarse su obra mayor, Elena Poniatowska estudia a su antepasado, el rey Stanislaw, en el contexto de la historia polaca del siglo XVIII, y va estableciendo un interesante paralelismo con su pro-

pia vida en México y su agitada historia contemporánea.

Stanislaw Poniatowski fue el último rey de Polonia como nación independiente, entre los años 1764 y 1795. Recibió una esmerada educación y de joven viajó por diversas capitales europeas, aprendió varios idiomas y se adhirió a las nuevas ideas ilustradas y democráticas, en contraste con la nobleza tradicional polaca, que haría todo lo posible para impedir el éxito de su futuro reinado. La novela critica ácidamente, por ejemplo, a la familia Czartoryski, nombre familiar en ambientes salesianos, pues uno de sus descendientes, *Augusto Czartoryski* (1858-1893) sería sacerdote salesiano, y fue beatificado en 2004.

El joven ilustrado Stanislaw pasa una temporada en Rusia, y allí se convierte en amante de la que luego sería la Zarina Catalina la Grande. Esta intervendría después para que Stanislaw fuera nombrado rey de Polonia en 1764. El nuevo rey intentó convertir Polonia en un país democrático e ilustrado, promoviendo la cultura y la educación de las clases bajas y medias. Él pensaba que «darle conciencia de sus derechos es la mejor manera de enseñarle a un pueblo a pensar» (p. 596).

Pero será paradójicamente su antigua amante, Catalina, quien le traicionará cruelmente y precipitará el dramático final de su reinado. Sus reformas fracasan y Polonia es repartida como una tarta entre Rusia, Prusia y Austria en 1795. Durante un siglo desaparece el nombre 'Polonia' de los mapas y el rey acabará sus días desterrado en San Petersburgo.

La novela describe la historia de estos dos expatriados, el rey Stanislaw y la propia Elena Poniatowska. Curiosamente, el monarca polaco se pregunta en cierto momento: «¿Cómo se protege a un país contra enemigos de la talla de Rusia?» (p. 434). Que se lo pregunten a los actuales habitantes de Ucrania...

Así, a través del desamor, la pérdida, la lucha por la justicia y los derechos humanos, avanza esta interesante novela que en última instancia nos habla de sentimientos, ideales, desamores y traiciones que se van repitiendo a lo largo de los siglos. Con razón escribiría el rey Poniatowski en su diario: «Nadie me hizo tanto daño como aquellos que decían amarme» (p. 504). En sus memorias, el embajador en Polonia Mazzei anotó: «El rey de Polonia era mejor conocido en las doce colo-

nias de América que en Europa. Lo consideraban un iluminado, el mejor ciudadano, un republicano y no un déspota como el resto de los soberanos europeos» (p. 702). Hay una pregunta que la dramática historia del buen rey Poniatowski va dejando poco a poco: *¿Merece la pena ser bueno? ¿Un rey no debe hacerse temer?* El siguiente diálogo con su principal colaborador es muy revelador:

- Majestad, sus cortesanos no son lo que cree. Un soberano no puede darse el lujo de ser ingenuo y decir *sí* a todo. Usted destila nobleza, pero cosecha burlas y engaños.
- Lo imagino, Glayre, pero a estas alturas prefiero creer en los demás que decepcionarme a cada paso (p. 434).

A pesar de su gran extensión, la novela se lee con mucho interés y el lector ve reflejada su propia vida y la historia de la humanidad con sus luces y sombras. Por eso el mensaje de la novela puede resumirse con la brillante dedicatoria con la que el abuelo de Elena Poniatowska encabezó un libro:

«A mis hijos y nietos, que no parecen saber a dónde van, para que sepan de dónde vienen» (p. 22).

Jesús Rojano Martínez.

Tolstói ha muerto

POZNER, V. (2022).

SEIX BARRAL. 322 PÁGS.



La Literatura es la manera más hermosa y más humana de contar la Historia. Dedicamos a continuación unas palabras a la estupenda obra *Tolstói ha muerto*, de Vladimir Pozner.

Traducido, prologado e introducido por Adolfo García Ortega, asistimos a un texto de tejido casi artesanal: la estructura complementaria, alternante respecto de los dos grandes cimientos narrativos —«Historia de un matrimonio», que reúne fragmentos acerca de la compleja relación entre Tolstói y Sofía Andréyevna, su mujer, y «El Drama», que supone el mismísimo eje central del trágico presente, instalado en noviembre de 1910, en torno a los últimos días del escritor en la estación de Astapovo—, responde a un minu-

cioso ejercicio de ensamblaje verosímil, bruñado por un dominio de los elementos y los tiempos literarios en su variante más periodística, mediante una crónica que agita nuestra curiosidad in media res, paso a paso, como si siguiéramos su argumento pegados a la radio.

Con un aroma casi detectivesco, el autor desgrana el carisma del singular genio ruso a través de un modelo de transcripción insólito, mezclado con dosis de teatralización, a partir del único goteo de información procedente del telégrafo ubicado en Astapovo. Elabora una crónica en movimiento, en directo, que envuelve lo que podríamos denominar una suerte de melancolía encarnada, de bella infelicidad.

Tolstói ha muerto no solo nos redescubre a Tolstói como uno de los mayores personajes de la Historia, sino que nos descubre directamente a Pozner: uno de los autores más completos y virtuosos de su generación, mucho más denostado por la ignorancia que por la crítica, presenta en esta obra una habilidad narrativa extraordinaria, de altísima originalidad y gran fuerza expresiva.

Tanto es así que logra dos éxitos inmediatos: por una parte, equipa-

ra la calidad del contenido, tan relevante, tan apasionante, con la calidad técnica, formal, que se desprende del genial modo en que nos lo transmite. Por otra parte, como una de las primeras consecuencias de ello, dota de una emoción magnánima a cada página.

La capacidad inmersiva de su estilo, la agilidad con la que transita la acción por tan extenso elenco de voces –de personajes ciertamente diversos, maravillosamente retratados– y la excelente adecuación del formato elegido en favor de una trama absolutamente dramática en su sentido más clásico cautivan sobremanera a un lector que solo puede entregarse a una magnífica experiencia.

A modo de conclusión del presente comentario, consideramos que *Tolstói ha muerto* es de lectura más que recomendable para los amantes de tan insigne figura humanístico-literaria, así como imprescindible para quienes aún no hayan tenido el placer de leer a Vladimir Pozner. El abrazo entre el panorama sociocultural dibujado en sus páginas y el permanente diálogo temático que establece con muchas de las grandes cuestiones de nuestra idiosincrasia como especie nos regala un viaje sumamente enriquecedor.

Fernando López García.

Humanos

QUINTANA-MURCI, L. (2021).

DEUSTO. 304 PÁGS.



¿Qué fue antes la genética o la genómica? ¿Por qué hemos llegado hasta este siglo XXI como seres inteligentes? ¿A costa de qué otros seres (humanos) o gracias a quién (o quiénes)?

Lluís Quintana-Murci es un prestigioso investigador franco-español que nos invita a viajar en el tiempo formulándonos preguntas sobre nosotros mismos y mostrándonos las respuestas en lo que llevamos inherente a nuestra propia sustancia como seres (humanos): nuestro código genético, nuestro ADN, la herencia de todos los que han ido contribuyendo a través de miles de años a que el ser humano del presente sea lo que es en este momento de nuestra evolución.

El viaje comienza en África, en una o en varias *áfricas*, probable-

mente de un único antecedente común, pero con continuas transformaciones y contaminaciones genómicas: *denisovanos*, *neandertales*, *sapiens*, *antecesor* y, probablemente, alguna que otra especie aún desconocida, pero presente en esa huella inevitable que es la herencia...No, no son tribus de un reino de Juego de Tronos, sino parte de nuestros orígenes, más o menos mezclados en una secuencia de más de 3000 millones de pares de bases entrelazadas en una espiral.

A lo largo del libro, se nos presenta una imagen global del sentido de evolución iniciado por Darwin y el de genética, que comenzaría fundamentalmente Mendel. Los primeros capítulos son una presentación de las diferentes fuentes que componen el mensaje críptico que es nuestro ADN; cómo se ha ido intuyendo, recomponiendo y definiendo; cómo ha influido en la configuración de los diferentes grupos poblacionales; cómo fue conquistando el mundo desde un lugar común, al noreste de África; como ha ido influyendo en la demografía de los diferentes continentes y países; cómo sus características han variado según los entornos, o las costumbres, o ambas cosas; cómo la selección natural ha contribuido a reforzar

nuestros sistemas de defensa inmunitaria o cómo nos ha hecho más vulnerables ante determinadas enfermedades. En definitiva, cómo nos ha ido alejando del simio que fuimos, aunque en palabras del autor, sin olvidar que no hemos dejado de ser unos primates (aunque humanos).

En la primera parte, más allá de una suma de cifras (bastante tenemos con los millones de letras del *cariotipo*), sigue dándonos vértigo asomarnos a millones de años de evolución, desde el momento en que los homínidos se apoyaron sobre sus patas traseras, hasta aquel en el que pintaron sus cuevas (hace unos 40.000 años), o empuñaron un arado (hace menos de 4.000). Asombra pensar que especies teóricamente inconexas, como el Neandertal y el Sapiens, comprobamos ahora que no solo coexistieron (como mínimo, un 2% de nosotros es neandertal), sino convivieron y configuraron los Humanos que ahora somos. Incluso gracias, también, a especies desaparecidas.

La segunda parte es la historia de un viaje sin fronteras, en el que homínidos de pequeño tamaño trascienden de continentes y abandonan el continente originario: más allá, el mestizaje se define

como la fuente de nuestros orígenes. Y los datos del genoma extraído en diferentes y numerosísimos estudios así lo demuestran. No es, sin embargo, nada fácil una respuesta homogénea a cómo fueron luego caracterizándose cada uno de los grupos humanos que definen nuestra actual sociedad: ¿Cómo se colonizó América? ¿Qué influencia tuvo Asia en la configuración genética de los actuales habitantes de Europa? ¿Y qué pasa en Oceanía, qué nos revela la genética sobre el origen migratoria de esas poblaciones? ¿De dónde, cómo y cuándo llegaron a esas islas remotas? ¿Podemos fiarlo todo al análisis genómico de unos fragmentos de hueso, a veces no demasiado pródigos? ¿Cómo se entiende actualmente –si es que es posible hacerlo–, el concepto de «raza»? ¿Qué rastros dejaron en todos esos individuos, –que somos nosotros mismos–, periodos como el de la esclavitud, el colonialismo...?

La tercera parte relata el proceso de adaptación al medio y las teorías (y evidencias) de la selección natural: de cómo los mejores individuos (o los que mejor saben hacerlo) son los que sobreviven. La importancia de la adquisición del lenguaje, las pequeñas variaciones

que se crearon en unos órganos determinados y la genética mantuvo y transmitió a las nuevas generaciones: unos pequeños huesos que modifican un cráneo y hacen posible emitir sonidos interpretables e intercambiables; unos determinados hábitos que provocan nuevos comportamientos según el clima o la altura; una alimentación que transforma también los cuerpos y realimenta nuevos posibles cambios... que llegan para quedarse.

La cuarta, está centrada en la historia de los principales avances (y retrocesos) que la genética tiene a la hora de enfrentarnos a los microbios. Si ya Orson Welles responsabilizaba a las bacterias como las principales aliadas de los humanos ante la invasión marciana en su Guerra de los Mundos, Quintana-Murci nos habla de las principales pandemias que nuestra cortísima historia –según los tiempos de la Evolución– ha conocido. Se trata de *pestes negras, malarías, tuberculosis, sídais, gastroenteritis, coronavirus* y otras zarandajas...

Hay una quinta y última parte aún, en la que se pone un énfasis mayor sobre las condiciones actuales de nuestra sociedad mestiza: más que un relato histó-

rico, es en este caso una prospectiva de futuro con una intención preventiva ante las amenazas que acontecimientos como la COVID-19 demuestran. El relato se centra en estudiar las repercusiones que nuestras actuales formas de vida están acarreado, o pueden acarrear: nuevos patógenos que surgen de manera más o menos provocada; posibles cambios que los tratamientos médicos pueden llegar a producir en nuestros sistemas inmunitarios; diferencias entre las afecciones de las poblaciones de la sobreabundancia y las que mueren por inanición; el futuro (esperanzador) de una medicina que utilice los conocimientos genéticos para convertirse en una herramienta de precisión, destinada a eliminar las dolencias pero sin llegar a dejarnos desprotegidos ante otras eventualidades.

¿Quiénes somos? ¿A dónde vamos? ¿De dónde venimos? Son las preguntas con las que empieza este libro y muy bien son las mismas que podemos utilizar para terminar de referirnos a él. En las últimas cuarenta páginas, una bibliografía que demuestra el ingente trabajo de investigación llevado a cabo por el autor, que se plasma en un libro brillante y apasionante.

Juan José García Arnao.

Los Medina

SANTOS, C. (2023).

EDEBÉ. 232 PÁGS.



Los Medina es la historia de una familia dedicada a la venta de droga. Sin embargo, el libro se centra en los jóvenes de la familia y sus luchas para abrirse paso en un medio hostil. Ángel Medina, dieciséis años, el nieto de don Nicolás, su nieto favorito, ansioso por hacerse un hueco en la jerarquía familiar; su hermana pequeña Jessica Medina, Jess, siempre seria, observando todo; y su primo Nico, de la misma edad que Jess, probablemente el único al que la chica escucha, su confidente.

La obra es amplia, como es el número de obras de Care Santos que cuenta con un largo historial. Care Santos es una escritora catalana que escribe tanto en castellano como en catalán. Nació en Mataró (Barcelona) en 1970. Empezó a

escribir a los 8 años, a los 14 ganó su primer concurso literario y a los 25 publicó su primer libro, una colección de relatos. Desde entonces, ha publicado catorce novelas, seis libros de cuentos, dos libros de poesía, un libro de aforismos y un gran número de novelas para jóvenes, entre las que destacan la saga formada por *Mentira*, *Verdad*, *Miedo*, *Ben* y *Los Medina* (Edebé), que la ha convertido en una de las autoras más leídas del momento. Su obra ha sido traducida a 23 idiomas, incluyendo el inglés, alemán, italiano, francés, rumano, polaco, sueco, noruego, holandés, coreano, persa y chino. Entre sus títulos destacan *Habitaciones cerradas* (Planeta, 2011), que fue adaptada a mini-serie de televisión y estrenada en TVE en 2014; *Deseo de chocolate* (Premio Ramon Llull 2014), *Media vida* (Premio Nadal 2017) y *Todo el bien y todo el mal* (Destino, 2018). Es colaboradora habitual de *El Periódico* y otros medios de comunicación. Imparte cursos de escritura creativa. En 2020 recibió el Premio Cervantes Chico, otorgado por el ayuntamiento de Alcalá de Henares otorgado al conjunto de su trayectoria.

La obra comienza de una forma muy llamativa con una especie de

introducción al mundo de la droga: se nos dan los muchos nombres que recibe, los problemas que acarrea, las consecuencias de su consumo para finalizar con un rotundo: «Yo que vosotros me concentraría en no ser parte del montón de desgraciados. En no dejar que un polvillo blanco, unas hojas verdes o una piedra enana de color marrón decidan vuestro destino» (p. 13).

Una obra muy bonita, muy bien narrada y con un fondo motivador muy profundo. **José Luis Guzón Nestar.**

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EDUCACIÓN Y FUTURO Nº 48

MARÍA AYUSO GOIG

Es graduada en Doble Grado en Educación Infantil y Primaria por la Universidad Autónoma de Madrid en el curso académico 2021/2022. A lo largo de este, ha recibido tres becas consecutivas por aprovechamiento académico excelente, otorgadas por la Consejería de Educación, Juventud y Deporte de la Comunidad de Madrid. A su vez, ha obtenido una nota media de 9,49 puntos y ocho matrículas de honor. Actualmente, cursa el Máster Universitario Online en Tecnología Educativa y Competencias Digitales en la Universidad Internacional de la Rioja y prepara el nivel C1 de inglés, habiendo obtenido en el año 2016 el nivel B2 de la citada lengua y de francés. Ha ejercido y lo sigue haciendo como profesora de inglés en Educación Infantil para la empresa English Plus. También, es tutora de Prácticum IV y Trabajo de Fin de Grado en el Grado en Educación Infantil en la Universidad Camilo José Cela durante el curso académico 2022/23. En el primer cuatrimestre de este mismo curso ha sido tutora de las asignaturas «La Escuela de Educación Infantil en España» y «Procesos de Enseñanza y Aprendizaje en Educación Infantil» en el Grado en Educación Infantil en la Universidad Nacional de Educación a Distancia. Ha participado como ponente en el Congreso Internacional de Investigación, Transferencia e Innovación en Educación en la Universidad Autónoma de Madrid en el año 2022 (<http://hdl.handle.net/10486/706174>), publicando también el artículo resultante en la revista de la Universidad de Granada Reidocrea: «Las propiedades físicas de la materia en el segundo curso de Educación Primaria a través de una secuencia de indagación» (doi: 10.30827/Digibug.77275).

JOSÉ ANTONIO FERNÁNDEZ BRAVO

Doctor en Ciencias de la Educación, por la especialidad de *Didáctica*. Profesor de *Desarrollo del pensamiento Lógico y Matemático* (Centro de Enseñanza Superior Don Bosco - *Universidad Complutense de Madrid*) (2000-). Decano de la Facultad de Educación de la Universidad Camilo José Cela (UCJC) (2013-2016). Director de la Cátedra Conchita Sánchez de Investigación para la Educación Matemática. Investigación de procesos para la innovación en la ense-

ñanza de las matemáticas en España, Canadá, USA (Michigan), Paraguay, Perú, Colombia, México, Alemania, Italia, entre otros. Director de seis Proyectos Europeos Leonardo de Investigación e Innovación Educativa. Colaborador del departamento de Primera Infancia y Educación Inclusiva de la UNESCO. Ponente Mentas Brillantes (2015), Aprendemos juntos (BBVA) «Cuaderno de viaje de un maestro» (2019). Premio de Metodología Creativa (Italia, Reggio Emilia, 2009), por el libro «*La resolución de problemas matemáticos. Creatividad y razonamiento en la mente de los niños*». Autor de 135 obras sobre Educación y aprendizaje de la Matemática. Extensa formación del profesorado y difusión en Congresos Nacionales e Internacionales.

GEMA JIMÉNEZ PUENTE

Máster Teaching English as a Foreign Language especialidad Teaching Through English in Bilingual Schools en la UAH de Madrid. Profesora bilingüe y directora del CEIP Daniel Martín (Alcorcón, Madrid). Diplomada en Magisterio en la especialidad de Lengua Extranjera (inglés) en la Escuela de Magisterio ESCUNI. Certificada en Flipped Learning a través de Flipped Learning Global Iniciativa con Jon Bergmann como instructor. Profesora bilingüe y directora del CEIP Daniel Martín. Profesora de UNIR en el Máster en Educación Bilingüe. Colaboradora-autora en los libros de CLIL de Educación Primaria Bilingüe en la editorial SM-Dyton. Formadora del Curso de Experto en CLIL de UNIR. Preparadora de exámenes de Cambridge PET y KET. Ponente en varias jornadas y congresos relacionados con la educación bilingüe en la Universidad Complutense, UDIMA, UAH, GRANADA y CRIF Las Acacias. Responsable-coordinadora de varios proyectos de formación en el CEIP Daniel Martín.

LAURA JIMÉNEZ MORENO

De vocación temprana, comenzó a trabajar en academias de inglés a los 18 años, compaginándolo con sus estudios de Magisterio de Primaria con especialidad en Lengua Extranjera, en la Universidad Complutense de Madrid. Tras diplomarme en 2009, se mudó a Londres, donde siguió perfeccionando el idioma. De regreso a España comenzó su labor educativa en centros privados y, en el curso 2011, gracias al programa «profesores visitantes», tuvo el privilegio de trabajar en New Mexico International School (Estados Unidos), formándose en la metodología IB. Al volver a España, y durante seis años, formó parte del equipo del

Colegio Ártica, especializado en trabajo cooperativo y por proyectos. En 2017 finalizó sus estudios de Máster en Enseñanza del Inglés como Lengua Extranjera en la Universidad de Alcalá de Henares. Finalmente, en 2019, se graduó como maestra en educación musical. Actualmente, ejerce su labor docente en la educación pública y sigue formándose en metodologías innovadoras y pedagogías alternativas.

ELENA TERESA LÓPEZ COBEÑAS

Doctora en Psicología. Profesora titular y directora de título de Grado en Educación Primaria Facultad Educación de la Universidad Camilo José Cela (UCJC) (2013-2016); (Secretaria académica 2012-2016) y (Premio a la docencia 2012-2013). Miembro del consejo editor de la revista FAISCA: Revista de Altas Capacidades. Formación del profesorado y difusión en Congresos Nacionales e Internacionales. Beca de investigación FPI Ministerio de Educación y Ciencia con referencia. SEJ 2005 - 00545. Estancia en la Universidad de Connecticut en Storrs (EEUU) en el departamento de Alta Capacidad y Talento, con el Profesor Josep Renzulli.

VICENTE JAVIER LÓPEZ MATE

Doctor en Estudios Literarios. Profesor asociado de Didáctica de la Lengua y la Literatura en la Universidad de Alcalá. Su área de investigación se centra en la literatura medieval inglesa, así como la enseñanza de la lengua inglesa a través de la literatura. Es miembro de la Asociación Artúrica Internacional. A lo largo de los últimos años ha formado parte y coordinado diversos proyectos relacionados con la innovación docente y la integración de los Objetivos de Desarrollo Sostenible en la docencia universitaria (Grupo de Trabajo Agenda 2030 «Promoción de los Objetivos de Desarrollo Sostenible a través de la Educación Superior: Humanidades y Ciencias Sociales») y en la proyección internacional de la Universidad de Alcalá en los que ha colaborado con profesores de las universidades más prestigiosas del mundo (Red Internacional de Estudios Culturales, Lingüísticos y Literarios en Lengua Inglesa: de la extensión a la difusión).

ANDREA MADRID TRÍBANO

Máster en Enseñanza de Inglés como Lengua Extranjera por la Universidad de Alcalá de Henares (UAH). Grado en Magisterio de Educación Primaria por la

Universidad Autónoma de Madrid (UAM). Título de idiomas ISEIII – C1 Integrated Skills in English por el Trinity College London de Madrid. Curso de inmersión lingüística – C1 por la Universidad Internacional Menéndez Pelayo (UIMP) en La Línea de la Concepción. Entre 2020 y 2022, auxiliar de inglés (Extracurriculares y preparación de CAE en centros educativos) en Brey Institute, S.L. Desde 2022 Seller Partnert Support Associate en Amazon Spain Services.

SARA SÁNCHEZ VÍLCHEZ

Máster en Enseñanza de Inglés como Lengua Extranjera. Maestra Graduada en Educación Primaria especialista en lengua extranjera inglés. En la actualidad: asesora técnico docente en instituto nacional de tecnología educativa (INTEF). Maestra de inglés en Educación Infantil y Primaria (Delegación de Educación de Castilla la Mancha 2016-2022): metodologías activas, proyectos metodología CLIL, trabajo colaborativo y cooperativo. Inclusión de nuevas tecnologías en la práctica docente. Programas de plurilingüismo, tutoría, experiencia en integración de currículo británico impartiendo Literacy, y participación en proyectos Erasmus. Maestra de lengua extranjera (Consejería de Educación de la Comunidad de Madrid 2014-2016): tutoría en centro bilingüe impartiendo lengua inglesa, ciencias naturales y sociales. Preparación pruebas KET y PET de Cambridge, Primaria y Secundaria. Maestra de español y Asistente de Conversación en Reino Unido 2012-2014 para niveles *year 3 a year 6* de acuerdo al currículum nacional KS1. Preparación de las pruebas GCSE al alumnado en Sixth Form.

Colaboraciones con la Universidad de Alcalá de Henares como miembro experto en comisión evaluadora Congreso de Estudiantes de Didáctica de las Ciencias Grado en Magisterio de Educación Primaria (MEDC) II, III, IV y V edición, y con el Instituto Nacional Tecnologías Educativas en Manchester (Reino Unido) para la elaboración de una presentación didáctica sobre la publicidad en España (30 horas).

ESTHER TESTERA SIMÓN

Grado en Maestro de Educación Primaria con Mención en inglés en la Universidad Autónoma de Madrid (2010-2014). DECA (Declaración Eclesiástica de Competencia Académica). Instituto Internacional de Teología a Distancia

(2015-2017). Máster Universitario en Enseñanza del Inglés como Lengua Extranjera – Especialidad en Teaching Through English in Bilingual Schools en la Universidad de Alcalá (2017-2019). Mención en Educación Física del Grado en Maestro en Educación Primaria Universidad Internacional de la Rioja (2019-2020). Certificate in Advanced English (C1) 2015 y Certificado de Nivel Avanzado EOI (C1) 2021. Participación en diferentes cursos (2014-2019): Aprendizaje basado en retos y problemas en entorno virtual – nivel avanzado, Portfolio de evaluación de competencias, A CLIL framework for Natural and Social Science, Flipped Classroom, The playground classroom- methodology at Primary level. ETI – Malta, Habilidades para el tratamiento de problemas de comportamiento infantil, Curso de metodología y perfeccionamiento en lengua inglesa para maestros de Ed. Primaria (Sussex University – Brighton), Cambridge English Teaching Framework Development Programme, La gestión Integral del Centro mediante el desarrollo de competencias complementarias.

VIOLETA VERA PÉREZ

Coordinadora bilingüe y profesora de inglés bilingüe en el CEIP Ciudades Unidas desde el año 2015. Comenzó a trabajar en la red de colegios bilingües en 2013, y ha llevado a cabo multitud de proyectos, entre los que destacan el primer premio y la mejor dirección en el Certamen de Teatro Escolar de la CAM en 2019. Diplomada en Magisterio – Lengua Extranjera por la Universidad de Alcalá en 2012, se ha especializado desde entonces en enseñanza y crianza bilingüe, asistiendo a congresos, cursos y formación en la universidad de Chichester. Finaliza en 2021 el Máster en Enseñanza del Inglés como Lengua Extranjera con matrícula de honor. Habiendo crecido personal y profesionalmente cerca de sistemas bilingües, con un C2 de inglés, tiene experiencia y conocimiento en los sistemas educativos británico y español, CLIL, el desarrollo del cerebro bilingüe en la infancia y la literatura en el aula.

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Nº 48

PRESENTACIÓN

Language and Content Instruction: Maximizing Student Engagement in Bilingual Primary Schools

TEMA CENTRAL

The Impact of Teaching Sciences Through Inquiry Based Learning in a CLIL Primary Classroom

El impacto de la enseñanza de las Ciencias a través del aprendizaje basado en la investigación en un Aula AICLE de Primaria

The Benefits of Implementing an Extensive Reading Program to Increase Vocabulary Acquisition in the Bilingual Classroom

Beneficios de implementar un programa de lectura extensiva para mejorar la adquisición de vocabulario en la clase bilingüe

Flipped Classroom Through CLIL: Evaluating Effectiveness of Flipped Learning in a Bilingual School

Flipped Classroom a través de CLIL: evaluando la efectividad de Flipped Classroom en un colegio bilingüe

Learning Centers Based on Multiple Intelligences: Enhancing English Language Learning in Primary Bilingual Education

Centros de aprendizaje basados en inteligencias múltiples: Una herramienta de mejora del aprendizaje de la lengua extranjera en contextos educativos bilingües

The Use of Short Stories and Phonemic Awareness in the EFL Classroom to Improve Students' Reading and Writing Skills

La utilización de Literatura y la conciencia fonológica en la Clase de Inglés como Lengua Extranjera para mejorar las destrezas lectoras y de escritura del alumnado

MATERIALES

A Teaching Proposal for English as a Foreign Language Classrooms: Adapting a Short Story from a Silent Short Movie to Promote the Visual-Imagery Strategy as a Reading Comprehension Technique

Una propuesta didáctica para el aula de Inglés como Lengua Extranjera: adaptando un relato corto a partir de un cortometraje mudo para promover la Estrategia de Visualización como técnica de comprensión lectora

ARTÍCULOS

Estudio de la práctica del método CEMA en Educación Primaria. Rúbrica de intervención

Study of the Practice of the CEMA Method in Primary Education. Intervention Rubric

El aprendizaje de las propiedades sensoriales a través de la instalación artística y la indagación en Educación Infantil

Learning Sensory Properties Through Art Installation and Inquiry in Early Childhood Education

Agenda 2030: Challenges in the Application of the Sustainable Development Goals in University Teaching

Agenda 2030: Desafíos en la aplicación de los Objetivos de Desarrollo Sostenible en la enseñanza universitaria

RESEÑAS

