

Actas

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EL BILINGÜISMO A DEBATE

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El bilingüismo a debate

Actas del IV Congreso Internacional de Enseñanza Bilingüe en Centros Educativos

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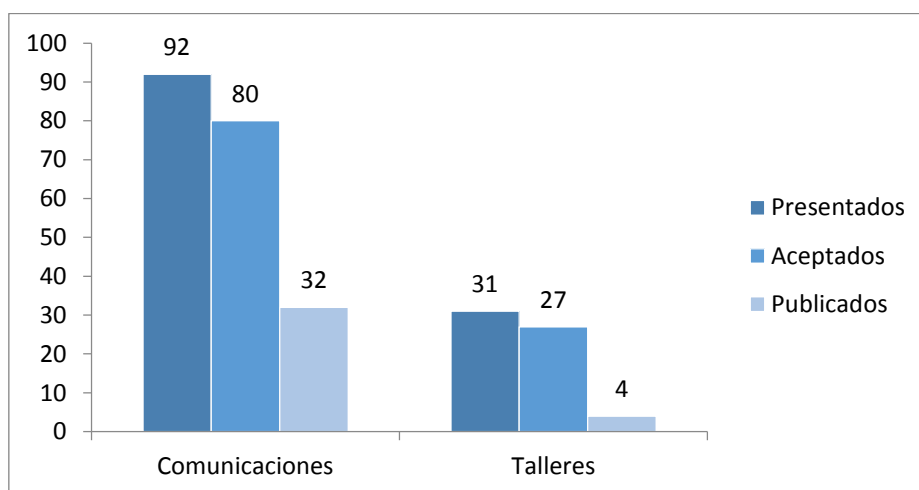
CIEB 2017

En el IV Congreso Internacional de Enseñanza Bilingüe en Centros Educativos (CIEB 2017) se presentaron para su valoración un total de 92 comunicaciones y 31 talleres.

Tras la revisión de todas las propuestas por parte del Comité Científico, se aceptaron un total de 80 comunicaciones, siendo rechazadas 12 propuestas, y un total de 27 talleres, siendo rechazados cuatro propuestas. No obstante, no todos los participantes enviaron su artículo para su publicación dentro del plazo previsto.

Por tanto, en estas Actas no se recogen las ochenta comunicaciones y los veintisiete talleres que fueron presentadas oralmente durante el Congreso, sino solamente las treinta y dos comunicaciones y los cuatro talleres cuyo texto completo fue recibido, revisado, evaluado y aceptado por los editores para su publicación. El Programa completo del Congreso puede consultarse en la página web del congreso: <http://www.cieb.es/>.

Para la publicación de la Actas del Congreso, se propone un formato digital con ISBN. En el siguiente gráfico, se muestra un resumen de los datos finales.



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PRESENTACIÓN IV CONGRESO INTERNACIONAL DE ENSEÑANZA BILINGÜE EN CENTROS EDUCATIVOS “LA ENSEÑANZA BILINGÜE A DEBATE”

La Universidad Rey Juan Carlos y la Asociación Enseñanza Bilingüe, fueron los organizadores del IV Congreso Internacional de Enseñanza Bilingüe en Centros Educativos –CIEB 2017– que se celebró en Madrid, en el Campus de Vicálvaro de la Universidad Rey Juan Carlos los días 20, 21 y 22 de octubre de 2017.

CIEB 2017, bajo el lema “La enseñanza bilingüe a debate”, planteo no solamente seguir analizando su funcionamiento sino también debatir sobre la enseñanza bilingüe, los programas, sus ventajas e inconvenientes, su desarrollo y su gestión, sus resultados, con el fin de contribuir a la búsqueda de soluciones para los problemas que se plantearon y por lo tanto, a la mejora de la calidad de todos los programas.

Un objetivo prioritario fue generar un foro de discusión, de debate, de intercambio de ideas y de experiencias entre profesionales de la enseñanza bilingüe y la enseñanza de idiomas y, a la vez, apoyar a los miles de maestros y profesores que han entendido perfectamente el potencial que supone ofrecer enseñanzas bilingües a sus alumnos, y que trabajan incansablemente, esforzándose por adquirir el mayor dominio de la lengua de instrucción y las máximas competencias posibles, tratando de incorporar a su labor docente los últimos avances tecnológicos y de utilizar en la enseñanza de idiomas, las variadas metodologías activas en boga hoy en día.

El Congreso CIEB 2017 como siempre tuvo un carácter innovador y promovió la presencia de expertos nacionales, tanto en aspectos prácticos como teóricos del bilingüismo.

COOPERATIVE LEARNING IN A BIOLOGY BILINGUAL CLASSROOM OF SECONDARY EDUCATION

Marina Gutiérrez Sejas

Resumen: El objetivo de la presente investigación es la implantación de aprendizaje cooperativo (AC) en un Instituto Bilingüe en inglés para determinar sus beneficios. Cuatro clases de 1ºESO fueron observadas realizando dinámicas cooperativas acerca de los Reinos microscópicos y el Reino *Plantae*, seleccionando uno de los grupos como control, con metodología individualizada. Se estableció que los grupos de AC estuvieran formados por cinco miembros de capacidad académica equilibrada y roles rotativos. Los estudiantes mostraron concepciones alternativas en aspectos básicos del AC, promoviendo su implantación. Además, el análisis de las rúbricas elaboradas indicó una correcta adquisición de los roles y un comportamiento adecuado. Sin embargo, la incorrecta elección del grupo control imposibilitó su comparación para analizar el rendimiento académico, teniendo que recurrir a calificaciones previas en la asignatura. En consecuencia, se evidenció un incremento notable en el rendimiento académico (evolución académica y porcentaje de mejora) de los grupos de AC con respecto al grupo control. La evaluación de esta metodología por el alumnado a través de las gráficas-diana demostró una correcta aceptación del AC. A la vista de los resultados extraídos se concluye la necesidad de implantación de metodologías cooperativas ya que presentan ventajas frente a dinámicas individualizadas.

Palabras clave: Aprendizaje cooperativo, modelos de enseñanza, biología, estudio

Abstract: The aim of this research was to implement cooperative learning (CL) in secondary English bilingual classrooms to determine its benefits. Four Biology classes of first year secondary education were observed cooperatively learning about Microorganisms and Plant kingdoms, selecting an individually-working control group. Cooperative learning groups were composed by five mixed-capacity members with established rotating roles. CL initial test showed students had misconceptions about this methodology, encouraging its implementation. The analysis of CL performance rubrics indicated a correct role acquisition and behaviour. However, the ineffective election of the control group to evaluate academic performance after CL lead to the consultation of previous academic results. Therefore, by the end of this research, academic performance concerning academic progression and percentage of improvement were remarkable in CL groups in comparison to the control group. Dart-charts employed to analyse student evaluation of CL showed a correct acceptance of the methodology implemented. In short, the results shown suggest the promotion of cooperative learning because of its advantages over individualistic methodologies.

Keywords: Cooperative learning, teaching models, biology, case study

Introduction

Spanish traditional view of education is often associated to passive transmission of knowledge together with a posterior memorization by students. However, this conception should be abandoned in order to adapt teaching systems to the requirements of XXI century students.

In a more specific context, this need of a change was evidenced after working during one trimester with several first-year bilingual section groups. A variation in the methodology had to be implemented in order to be better adapted to the difficulties students show by promoting significant learning. After considering

different novel learning methods, cooperative learning was chosen as the best adapted to the sample utilized.

Cooperative work takes place when an individual interacts with his/her companions and the environment, stimulating the creation of a learning process in which social contexts are valuable (Serafín, 2016) (Tsay y Brady, 2010). The importance of cooperative methodology is verified through a wide range of psychological principles but Vygotsky theory stands out. Vygotsky holds that human development is more influenced by social and cultural processes compared to biological ones; it also states that enjoying diverse social experiences stimulates the development of alternative mental processes (Vygotsky, 1979).

Besides, the elements which classify group work more specifically into a cooperative methodology have to be clarified. One of the most important ones is the “positive interdependence”, by which students believe that the objective is only reached when the team works collectively. The other fundamental element that allows the identification of cooperative work is “individual responsibility”: a member’s intervention must be appreciated in a personal and distinct way in order to promote the participation of all the students. Other elements that assure cooperative work is successful by creating a feedback continuous communication and by proportionating techniques to develop leadership or conflict management in the group, are known as “simultaneous interaction” between members, “promotion of personal and social skills” and “group processing” (Akdemir y Arlasan, 2012) (Johnson y Johnson, 1999) (Kyndt et al., 2013). Apart from these five basic elements, others such as equal participation or heterogenic groups can be added (Veenman et al., 2002).

Consequently, the principles described above together with the consideration of different parameters as interactions between pupils or working structure are essential to distinguish cooperative learning from other methodologies (see Table 1). The age of implementation can be an additional criteria used to differentiate the commonly equally considered terms “collaborative learning” (addressed to university students) and “cooperative learning” (assigned to younger pupils) (Bruffee, 1995).

Learning Methodology	Characteristics		
	<i>Work</i>	<i>Student learning goals</i>	<i>Student’s perception of his/her mates</i>
Individualistic learning	Individual	Individualized and unique	Absence of comradeship as learning is isolated
Competitive learning	Individual	Common	Rivalry between students
Cooperative learning	Done in small groups	Common between the members of the group	Mates are considered a source of knowledge

Table 1. An overview of individualistic, competitive and cooperative learning according to characteristics such as type of work, student learning goals and student’s perception (*Adapted from Kimberly et al., 2003*).

Having briefly described the characteristics of cooperative learning together with its differences when compared to other methodologies, the case-study previously mentioned has to be detailed. The main objective of this investigation was the implementation of cooperative learning to analyse if it adjusted better to the diversity students show, and therefore examine if it increased their motivation, promoted an effective learning and improved their marks. Secondary aims of the research were to design working materials attractive for the students or to introduce self and peer- evaluation dynamics.

Therefore, the educational study designed assumes the initial hypothesis by which the introduction of a cooperative methodology involves an improvement in: academic results, way of working in class and students' satisfaction. Further, these progressions will be more significant in groups which show a higher academic diversity and more difficulties during the learning process.

In order to carry the investigation out, a sample composed by 112 first year bilingual-section students of secondary school at the English bilingual IES Ángel Corella (Madrid) was selected. The research was conducted during Biology and Geology lessons in which the contents to cover corresponded to the study of Monera, Protista, Fungi and Plant kingdoms. With a view to facilitate the analysis of results obtained in the investigation, students were maintained in their reference groups and one of them was selected as the control group (1st ESO F). The academic profile analysis together with the marks obtained in the subject (Biology and Geology) in the previous trimester was the criteria established to decide the methodology implemented in each of the four groups.

Therefore, the two groups with a lower academic performance (1st ESO C and 1st ESO D) were implemented cooperative dynamics to analyse their adaptation to new learning techniques, especially in the most conflictive class (1st ESO C); the control group was randomly selected between the two classes with higher academic results and behaviour (1st ESO E and 1st ESO F) (see Table 2).

Class	Students	2 nd evaluation average mark in B&G	General characteristics	Methodology implemented
1 st ESO C	30	6,16	Low academic performance and problematic group	Cooperative
1 st ESO D	24	5,81	Low academic performance but curious group	Cooperative
1 st ESO E	28	7,21	High academic performance and excellent behaviour group	Cooperative
1 st ESO F	30	7,00	High academic performance and excellent behaviour group	Individualistic

Table 2. Distribution of the sample of students utilized in the research.

Succinctly, three out of the four classes of the sample worked cooperatively. In order to avoid the exclusion risk and to encourage cohesion between the students, cooperative groups were composed by five members with balanced academic performance (Bonals, 2000) (Vidal y Fuertes, 2013). Furthermore, rotating roles with associated functions were arranged in each group (listed in decreasing complexity order): group leader (ensures correct performance of the group and submission of the work), encourager (guarantees the participation of all the group members), secretary (the only person in charge of writing the answers to the work), referee (assures the correct behaviour of the group and keeps the volume low) and time keeper (must have a watch to inform about the time left in each activity). The rotation was carried out gradually during three sessions and finished with the academically weakest student occupying the most complicated role (group leader). In addition, students were provided a bank of expressions for each role to facilitate the progression of the cooperative activities.

In this context and having described the sample utilized in the research, the general organization of the methodology has to be outlined. An initial knowledge test was completed by all the groups, handing a second test about cooperative methodology to the groups working this way; the meticulously planned cooperative activities were executed after, considering the acquisition of the same knowledge by the control group (1st ESO F). The research ended with the completion of a final knowledge test and an additional self and peer evaluation for the cooperative working groups. The effectiveness of cooperative learning methodology could not be proven when comparing the results obtained by the control group (1st ESO F) to the cooperative ones as it will be reported later. Consequently, previous academic results had to be consulted in order to evaluate the benefits of the methodology implemented (see Figure 1).

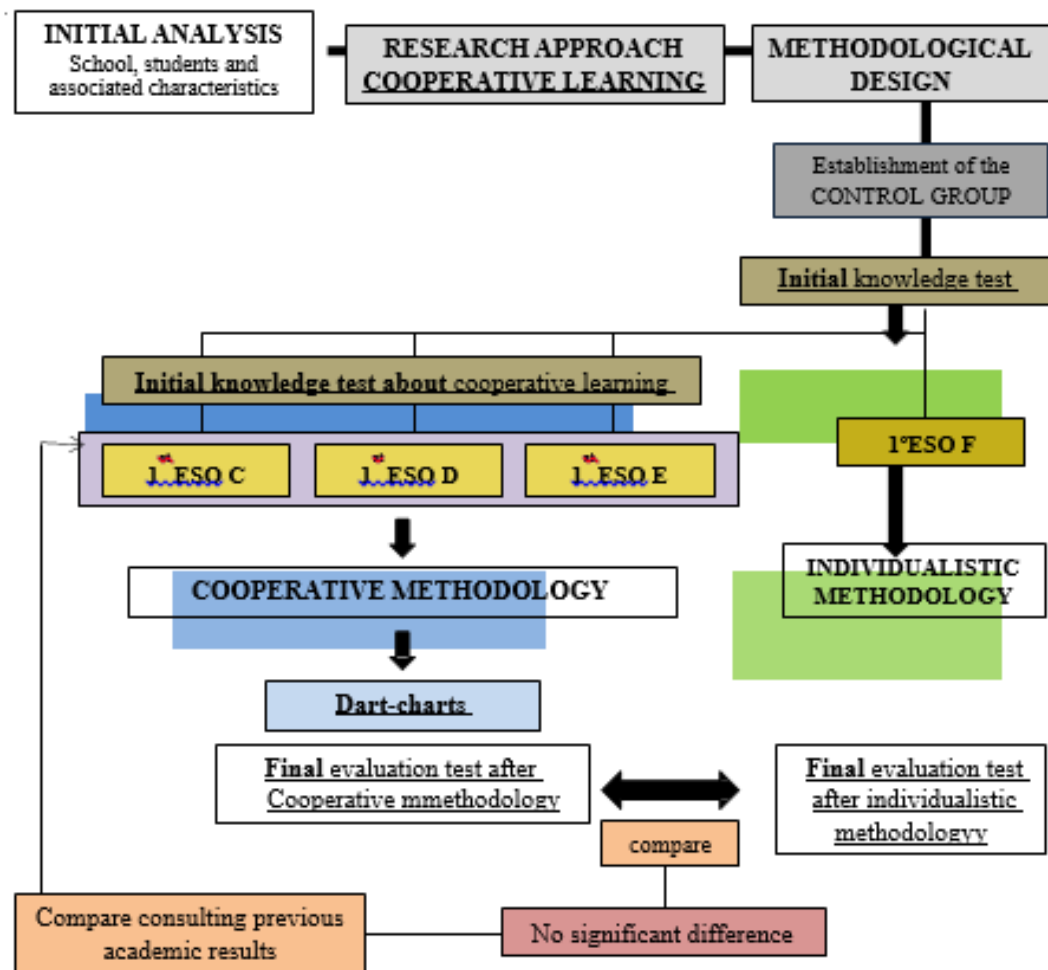


Figure 1. Flowchart of the methodology employed in the research.

It is clear that the case-study aims to evaluate the efficacy of the cooperative methodology considering the sample and method explained. However, the different cooperative activities involved in the research have not been detailed. The investigation took six sessions organised following a gradual increased complexity, in which the contents related to Microorganism and Plant kingdoms were covered (see Table 3). Furthermore, it is important to mention that each task had associated a specific time because of the inexperience students showed in this methodology, as it will be shown later. Besides, it is remarkable that the control group (1st ESO F) carried out the same activities but individually and considering some exceptions such as the delivery of posters elaborated by the teacher, to fulfil the table titled “Plant Uses” during sessions 4 and 5.

Session/ Methodology	Contents	Activities
Session 1 Individualistic	-	Fulfilment of initial test about CL <i>10 statements about cooperative learning to grade from 1 (disagree) to 5 (totally agree) points</i> Fulfilment of initial evaluation test <i>9 questions (short answer or true/false statements) to estimate knowledge and alternative conceptions about the topic "Microorganisms and Plants"</i>
Session 2 Cooperative	Bacteria kingdom	Basic explanation about CL and distribution of roles Cooperative activity 1 <i>Short text about bacterial infections in XX century hospitals with 5 questions attached</i>
Session 3 Cooperative	Fungi kingdom	Redistribution of roles following rotation criteria Cooperative activity 2 <i>Projection of two videos related to Fungi (video 1: explanation of their characteristics; video 2: formation of mould in hamburgers) with 6 exercises to debate</i> Distribution of texts (related to plant uses) to read and summarize for next session
Session 4 Cooperative	Plant kingdom	Redistribution of roles following rotation criteria Cooperative activity 3 – Part A <i>Construction of a poster associated with one plant use (e.g: Plants and biotechnology) by sharing the main ideas of the text read at home. Poster structure must include: title, abstract, introduction and two examples of the topic covered</i>
Session 5 Cooperative	Plant kingdom	Roles remain the same as Session 4 Presentation of the abstract of each <i>By the encouragers of each CL group</i> Cooperative activity 3 – Part B <i>Coordinated exchange of posters between groups to complete a global table about plant uses</i>
Session 6 Individualistic	-	Fulfilment of final evaluation test <i>10 questions similar to the initial evaluation to evaluate the efficacy of the methodology implemented</i>
Fulfilment of two dart-charts referred to self and peer-evaluation <i>The area of the geometric figure obtained after connecting the punctuation (1-5) given to each question in the dart-chart, visually evidences the results of each survey</i>		

Table 3. Distribution and description of sessions, contents and activities carried out in the investigation (CL: Cooperative Learning).

Once the methodology and its implementation have been described, the results obtained in the research have to be explained. In order to make their interpretation easier, they have been divided into four research variables with the

corresponding instruments used for the analysis (see Table 4). It has to be remarked the fact that academic performance is the only category in which a comparison with the control group (1st ESO F) is made because the rest are related exclusively to cooperative working aspects.

Research variables	Instrument
Previous knowledge about cooperative learning	Initial test about cooperative learning ¹ (<i>see Table 3</i>)
Acceptance and attitude towards the role assigned	Cooperative groups rubric ² <i>Evaluates the acceptance of the role by the student (1-3 points) together with the work submitted by the group (1-5 points) according to the established criteria</i>
Academic performance	Initial evaluation test (<i>see Table 3</i>) Final evaluation test (<i>see Table 3</i>) Cooperative groups and control group rubrics <i>Analyse the quality of submitted work progressively (cooperatively or individually)</i> Analysis of previous academic results in B&G
Satisfaction and accomplishment of objectives during cooperative learning	Two dart-charts referred to self and peer-evaluation ³

Table 4. Research variables and the instruments employed to collect information for the investigation.

The report of the results starts referring to the analysis of the previous knowledge the students had about cooperative learning, for which the initial test about this methodology is interpreted (see Table 4). Its examination evidences that students had previously worked in groups but emphasises the lack of basic knowledge on cooperative learning working techniques: an elevated fraction (70-100%) of students working cooperatively in the three classes (1st ESO C, 1st ESO D and 1st ESO E) declares that cooperative groups are formed by their friends or that two people can talk simultaneously when working in a cooperative way.

The erroneous conceptions are clearer in the most problematic class (1st ESO C), in which a 30% of students affirms that cooperative work does not include aspects such as assisting a peer to understand an activity or participate. Therefore, the

¹ The fulfilment of the initial test about cooperative learning is ignored by the control group (1st ESO F) as it is an instrument referred to cooperative dynamics which this group does not follow.

² The cooperative groups rubric is not applied to the control group (1st ESO F) because they work individually. In this case the rubric implemented only evaluates the work submitted individually (1-5 points) as the methodology is conventional.

³ The individual methodology implemented to the control group (1st ESO F) impeded the completion of the dart-charts as they are referred to the self and peer-evaluation of the members of a cooperative group.

analysis of this test confirms several misconceptions related to basic principles of cooperative learning (including positive interdependence and simultaneous interaction) and evidences the necessity of developing a correct cooperative methodology to benefit students.

The second variable analysed makes use of the cooperative groups rubric to evaluate the acceptance and attitude towards the roles assigned (see Table 4). The gradual increment of results obtained after extracting the punctuation of the individual role assumption (1-3 points) demonstrates: a progressive improvement in the cooperative methodology implemented, together with an increasing acquisition of the previously mentioned cooperative learning elements (see Figure 2). Hence, the cooperative methodology implemented promotes an appropriate learning atmosphere and correct student behaviour (Kimberly et al., 2003).

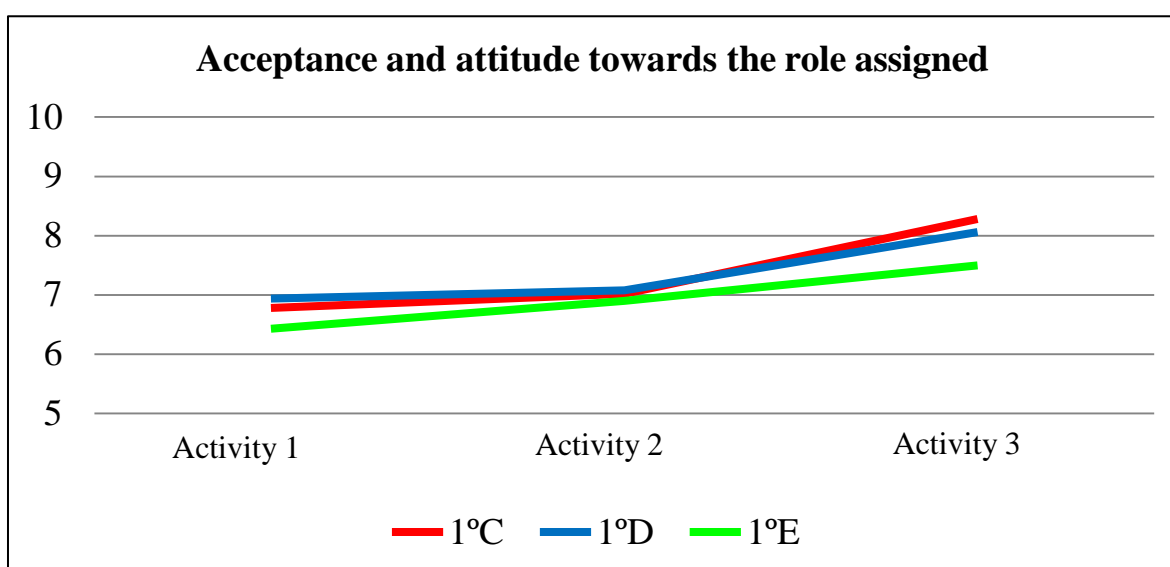


Figure 2. Line graph representing the acceptance and attitude towards the cooperative role assigned along the three activities (data extracted from cooperative groups rubric).

Thirdly, academic performance is the only variable which compares the results obtained by the groups working cooperatively with the control group (1st ESO F). However, this comparison is not effective probably due to the prominent superiority regarding academic performance and marks obtained by the control group (1st ESO F). Consequently, previous academic results in Biology and Geology are consulted to determinedly analyse academic performance in the groups working cooperatively.

Therefore, the advantages of cooperative learning concerning academic performance are evidenced when comparing the final evaluation results of the research to the average of three marks obtained in previous individualistic theoretic exams in the subject (see Table 4): the three classes working cooperatively show an increment in the academic results when following this methodology (see Figure 3). Additionally, this augmentation is larger in the most problematic class (1st ESO C) indicating an appropriate adaptation to the cooperative dynamics implemented. As a consequence, the benefits of cooperative methodologies (socialization and joint learning) in

opposition to traditional rote learning are demonstrated (Tsay y Brady, 2010).

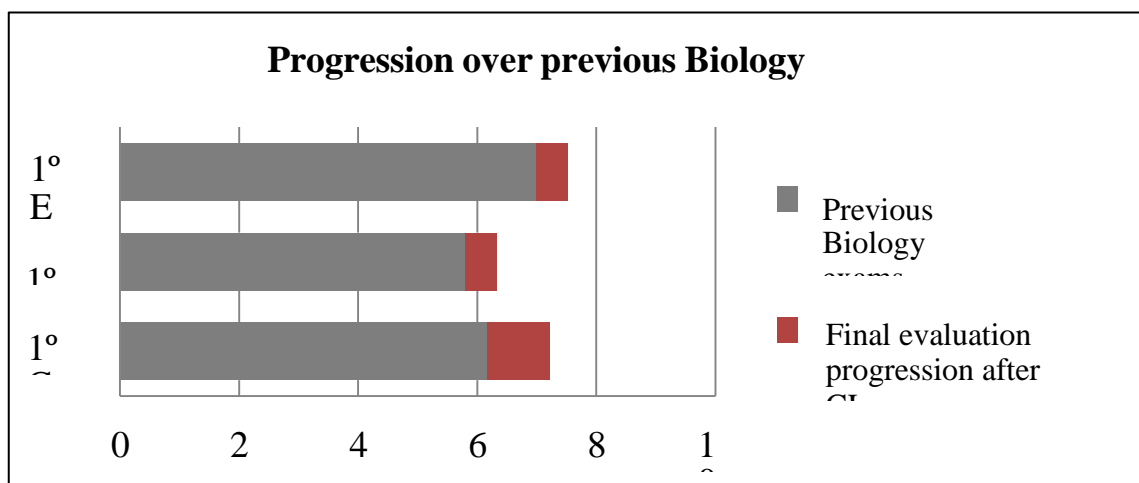


Figure 3. Bar graph representing the progression of cooperative methodology over previous Biology exams (data extracted from final evaluation after cooperative learning and from three previous theoretic exams after individualistic methodology)-

Moreover, academic performance can be also analysed with the results registered in the rubrics employed (both control and cooperative rubrics) to show the improvement in the activities submitted along the sessions (see Table 4). Despite of the higher results obtained by the control group (1st ESO F) due to their elevated academic level, the academic progression of cooperative groups is notable (see Figure 4). In addition, the cooperative groups show in the last activity, almost the same results as the control group, indicating the power of these dynamics and differing from previous studies which affirm that cooperative methods make learning difficult due to excessive socialization (Gillies y Boyle, 2010). Further, it can be conjectured that if cooperative activities continued, results would exceed the ones shown by the control group (1st ESO F).

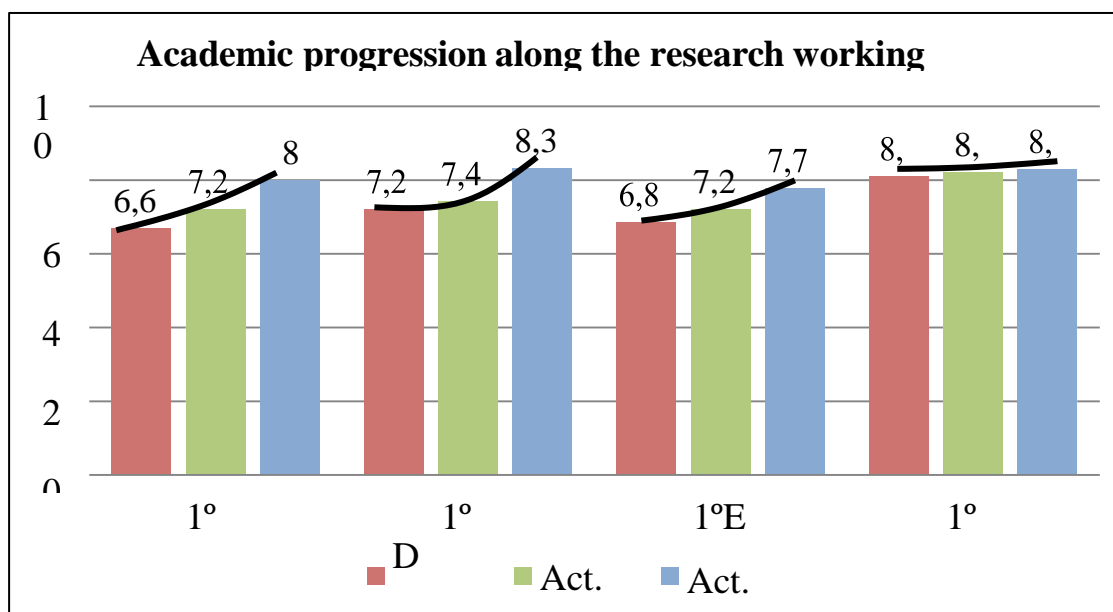
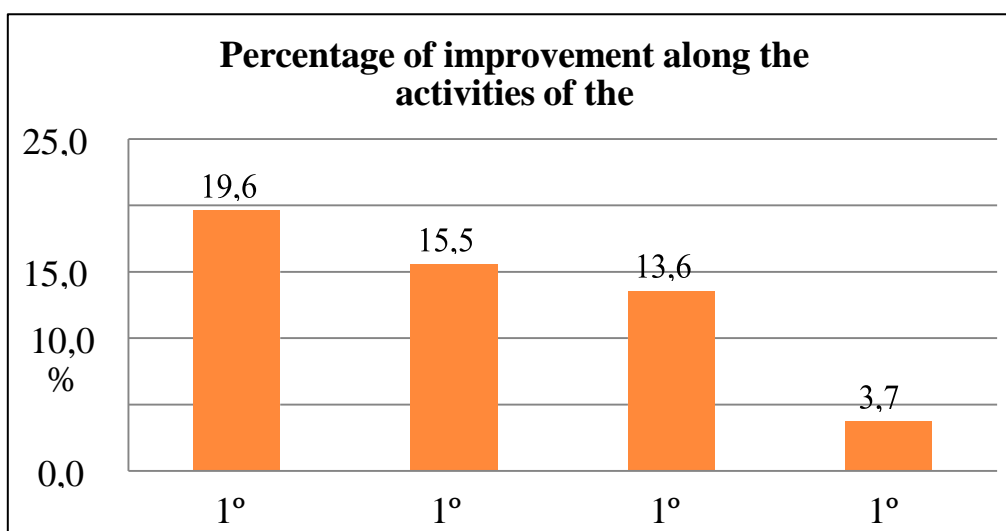


Figure 4. Bar graph representing the academic progression of each methodology (cooperative or individualistic) along the three working sessions established (data extracted from the cooperative and control group rubrics for each session).

However, the most visible evidence of the benefits cooperative learning takes on academic performance are indicated when analysing the percentage of improvement through the different activities carried out (values taken from the cooperative and control groups rubrics) (see Figure 5). This percentage is greater in the classes that work cooperatively in comparison to the control group (1st ESO F), reaching its highest value in the most problematic group (1st ESO C). A gradual academic progress together with an increase in academic performance are proven.



Although several analysis and comparisons were carried out to evidence the effectiveness of cooperative learning, only the most significant and representative ones have been shown. Nevertheless, all the comparatives demonstrate clear

benefits for students' academic performance and advancement when implementing cooperative learning dynamics in opposition to traditional individualistic methodologies.

The last research variable to analyse refers to satisfaction and accomplishment of objectives during cooperative learning and is examined using the two dart-charts (see Table 4), which self and peer-evaluated students after cooperative dynamics through six questions to grade from 1(disagree) to 5 (completely agree). Both dart-charts are given a positive punctuation (3 to 5 points) but students tend to be more judgemental when peer-evaluating (see Figure 6). This difference could be justified by an egocentric behaviour which characterises the young-teenagers that conform the sample employed (Berger, 2004). The additional question asking about the possibility of continuing with the same cooperative groups in future activities indicated that most students would accept it, and therefore demonstrates the successful distribution of students done for the research. However, from an educational perspective groups should be modified in future dynamics to promote socialization. Furthermore, evidence of a correct leadership by the academically weakest students in the last session was noted, proving that the model of rotating roles was correctly designed.

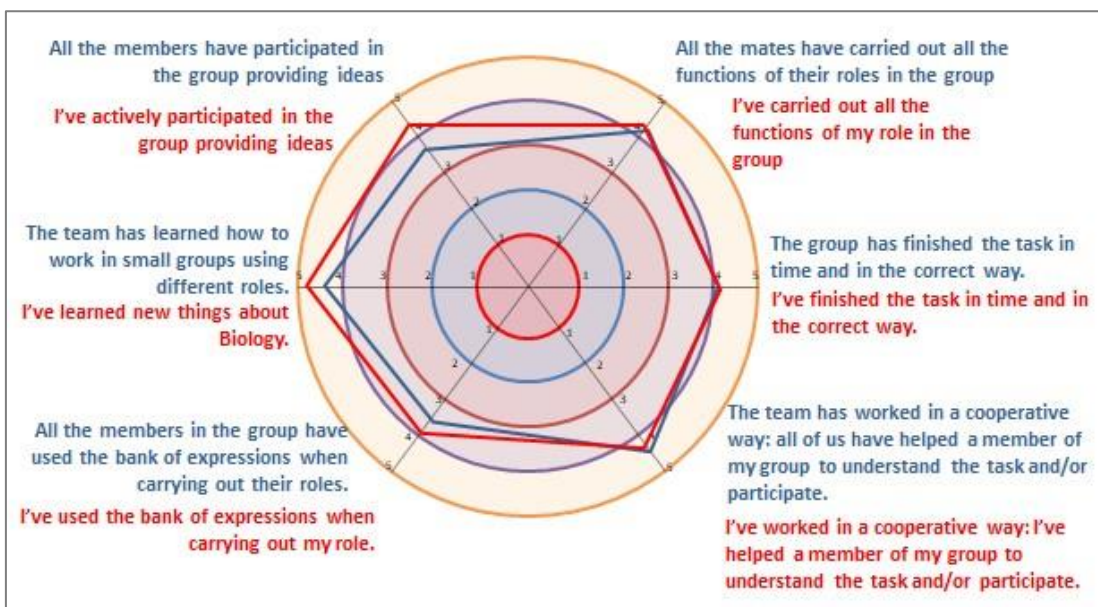


Figure 6. Dart chart representing auto (red color) and peer evaluation (blue color) although students were given two separate dart charts (data extracted from the average value from the three classes working cooperatively).

To conclude, the research evidences the efficacy of cooperative learning: it benefits the students that follow these dynamics promoting an effective learning, which can be demonstrated when analysing the progression of results along the cooperative sessions and the percentage of improvement compared to the control group. Consequently, the initial hypothesis enunciated has been proven as the academically more diverse and difficult group is the one that shows a higher improvement rate when working cooperatively. Nonetheless, the conclusions extracted from this research must be read with caution due to the sample size utilized or the incorrect election of the control group, which impeded the comparisons with cooperative groups due to its higher academic level.

Furthermore, it would be convenient to continue this investigation with future studies in other subjects, educational stages or schools to contrast the results presented. These suggestions aim to obtain general conclusions that strengthen the selection of cooperative learning over other traditional methodologies.

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