



Facultat de Psicologia, Ciències
de l'Educació i de l'Esport **Blanquerna**

Universitat Ramon Llull

laSalle

UNIVERSITAT RAMON LLULL

FACULTAT DE PSICOLOGIA, CIÈNCIES DE L'EDUCACIÓ I DE L'ESPORT

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Project-based learning in Secondary Schools

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Resum

Aquest estudi té per objectiu avaluar les percepcions dels estudiants i professors quan a la implementació del treball per projectes, en aquest cas, l'itinerari que s'anomena SUMMEM de l'Escola Pia Nostra Senyora. S'analitzarà l'itinerari que s'ha dut a terme en 2n d'ESO en el curs 2019/2020. Els participants han sigut 20 alumnes de 2n d'ESO i set professors. SUMMEM és un projecte transversal on els alumnes treballen de forma cooperativa i de caràcter inclusiu. En l'estudi, es pretenen avaluar els aspectes relacionats amb els objectius que tenen aquest mètode d'ensenyament, de quina manera s'apliquen i quines són les percepcions per part de les persones involucrades en el projecte. S'ha emprat una metodologia basada en la distribució de qüestionari dissenyat per contrastar les percepcions tan dels alumnes com dels professors.

Paraules clau: treball per projectes, SUMMEM, itinerari, percepció, objectius, projecte transversal.

Resumen

Este estudio tiene como objetivo evaluar las percepciones de los estudiantes y profesores en cuanto a la implementación del trabajo por proyectos, en este caso, el itinerario que se llama SUMMEM de la Escola Pia Nostra Senyora. Se analizará el itinerario que se ha hecho en 2º de la ESO en el curso 2019/2020. Los participantes han sido veinte alumnos y siete profesores. SUMMEM es un proyecto transversal donde los alumnos trabajan de forma cooperativa y con carácter inclusivo. En el estudio, se pretende evaluar los aspectos relacionados con los objetivos que tienen estos métodos de enseñanza, de qué manera se aplica y cuáles son las percepciones por parte de las personas involucradas en el proyecto. Se ha usado una metodología basada en la distribución de cuestionarios diseñados para contrastar las percepciones tanto de los alumnos como de los profesores.

Palabras clave: trabajo por proyectos, SUMMEM, itinerario, percepción, objetivos, proyecto transversal.

Abstract

The aim of this study is to inquire students and teachers in regards to the implementation of working in projects, in this case, the itinerary called SUMMEM from Escola Pia Nostra Senyora. The itinerary of 2nd of ESO of the year 2019/2020 is going to be analysed. The

participants were 20 students and seven teachers. SUMMEM is a transversal project where students work collaboratively and inclusively. In particular, the aim is to evaluate aspects in relation to the objectives that have this type of teaching methodology, the way it is applied and what are the perceptions from the members involved in the project. The methodology used is based on the distribution of questionnaires designed to contrast perceptions from both, teachers and students.

Key words: working in projects, SUMMEM, itinerary, perception, objectives, transversal project.

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1. INTRODUCTION

The Spanish Education System is giving more and more importance to collaborative, cooperative work and problem-based learning. Schools are incorporating this method as the basis to learn. For example, in problem-based learning, starts with an open question and students have to try to answer it by carrying out different activities. Usually, one of the final products is a tangible object which makes the project very attractive. Semi-private schools or private schools are starting to promoting this type of projects which can be very appealing for parents. Nevertheless, research proves that students acquire more and better information when they are working in groups. Some of the reasons behind are that students when working with other students, they can observe different points of view and contrast them. Another reason that has been provided is that having a student-centred class can help students who have some difficulties to follow the class. In theory, this is a really good method to use in class but what about when this theory is put into practice? For this reason, the present dissertation will try to shed some light in this regard.

2. OBJECTIVES AND HYPOTHESIS

The goal of this research is to explore the perceptions of students and also teachers with this type of collaborative and cooperative approach in learning.

1. To observe if students consider that the integration and the level of English have been adequate.
2. To explore whether students enjoy working in projects and working with other students. Also, if teachers think that students are enjoying the activities and working in groups.
3. To analyse if students and teachers perceive that one of the main objectives of working in project is achieved; students learn more while working in groups.
4. To consider what is the students' viewpoint regarding the length of the project, the activities, the theme, the level and their experience.
5. To examine what students think are positive aspects and negative aspects of the itinerary. Also, to investigate what teachers consider as weak points of this project.

The above objectives lead to the below hypothesis:

- Has the English language and the level been adequately integrated into the itinerary?

- Do students enjoy working in projects and with other students? What is the teacher's perception?
- Do students and teachers think that they learn more while working in groups?
- How do students consider the itinerary in terms of the length of the project, the activities, the theme, the level and their experience?
- What do students perceive as positive and negative aspects of the itinerary? What do teachers consider as weak points of the project?

3. THEORETICAL FRAMEWORK

3.1. The Nature of Learning

The Nature of learning: using research to inspire practice is a volume that includes extensive research on different perspectives of learning and applications. Its content of the book serves to apply numerous approaches in our nowadays society. Some of the aspects that the document includes are the 7 principles of learning.

According to this research, these principles need to be included in order to students to acquire new contents of the school curriculum. The first principle is that the learners are the centre, therefore, they are the ones who explore and construct their learning process “Learners are the central players in the environment and therefore activities centre on their recognition and growth” (Dumont, Istance and Beenavides 6). The second principle states that social nature is part of the learning process, hence, a social environment needs to be encouraged, for instance, by working cooperatively “Neuroscience confirms that we learn through social interaction — the organisation of learning should be highly social” (Dumont, Istance and Beenavides 6). The third principle affirms that emotions are integral to learning, thus, motivation needs to be paid attention by making learning more effective. The fourth principle remarks recognising individual differences among students, taking into account their prior knowledge. As a consequence, avoiding the “one size fits all” approach in teaching, by adapting activities according to these difference that may be found in a class. The fifth principle claims that all students have to be stretched, therefore, to ask them hard work and challenge but without excessive pressure. The sixth principle asks for assessment for learning by providing students what is expected from them and why. Formative feedback is strongly emphasised. Finally, the seventh principle expresses building horizontal connections to provide a good environment to

learn. This is applied by establishing a connection between formal learning and the environment and society. Thus, to promote authentic learning to have a deeper understanding

These previous principles are represented in work in projects since students are in the centre of the process, they have to socialise between the group to carry out the activities so at the same time, emotions are involved in this process. In addition, this type of projects covers different aspects and approaches in learning so more chances can be fitted to different learner's profiles. This type of work is demanding and challenging for students but from the beginning, they already know the rubrics and what is expected of them. Finally, these projects aim to be transversal and connected to their environment so horizontal connections are taking place.

3.2. Constructivism

Constructivism is considered to be the process in which learners construct or create their knowledge from their experiences “an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner (Elliott et al., 2000: 256). This aspect is promoted in Project-based learning where the content of the activities is related to their environment and experiences.

If experiences are taken into account in the learning process, knowledge is not innate in human beings but it is constructed from previous learning. According to Philips (1995) this prior knowledge influences what new or modified knowledge an individual will construct from new learning experiences. Hence, the process of learning is a constant modification or addition of a previous knowledge.

Another important aspect of constructivism and is still considered in pedagogy is that learning is an active process rather than passive. As mentioned before, Eliot et. Al., (2000) consider that people actively construct or make their own knowledge. This is a great shift in teaching since learners are no longer view as passives, as “an empty vessel” to be filled with knowledge. This is promoted as well in Project-based learning since students are adopting an active role (e.g. when doing research).

There are different perspectives in constructivism but three of them are going to be considered. On the one hand, cognitive constructivism based on Piaget (1936) where he tries to explain how a child constructs mentally a model of the world. According to Piaget, children are born with a basic mental structure on which all subsequent learning and knowledge are based. On the other hand, social constructivism developed by Lev Vygotsky (1978) emphasized how

social interaction is key in the development of cognition. He defended that community plays a central role in the process of “making meaning”.

Nowadays, one of the approaches that has been taken is the combination of both, Vygotsky and Piaget. Therefore, students are learning from both perspectives, individual contribution from students and also the dynamic of social relations that are established between participants, teacher and students in a classroom.

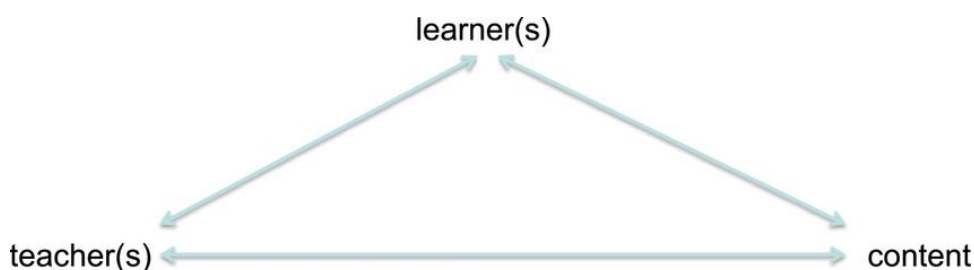
"si incorporamos las perspectivas socio-cultural y lingüística al modelo cognitivo de los procesos mentales, es posible vislumbrar cómo el lenguaje y los procesos sociales del aula, constituyen las vías a través de las cuales los alumnos adquieren y retienen el conocimiento" (Nuthall 1997: 758)

This last idea is reflected in Project-based learning since both, the individual contribution and social interaction will be part of the process when carrying out the activities.

3.3. The didactic triangle

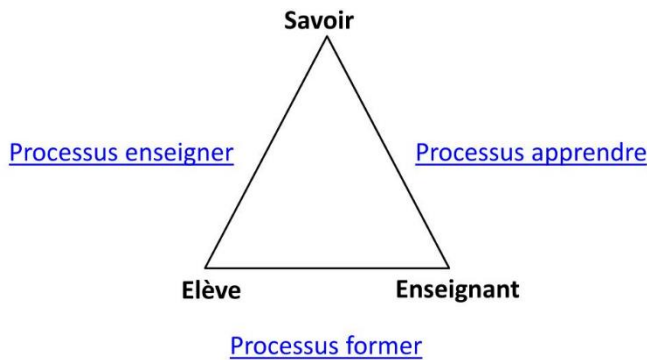
This didactic triangle can be found from the ancient world. Cicero on his work *De Oratore* and Quintilian in his work *Institutio Oratoria* already wrote about the education of an orator, expanded with the rhetorical triangle by Aristotle and finally into a didactic triangle. The parts of the triangle are the learner(s), the teacher(s) and the content to be learnt and taught. Additionally, it provides the relationship between the constituent parts: the relationship between learner and teacher, between learner and teacher, between learner and content, and between teacher and content.

Representation of a didactic triangle:



This model has served to many authors to attempt to explain a didactic situation, for example, Houssaye (1996) in his model, he defines any pedagogical act as the space between the three vertices of the triangle: the teacher, the pupil and the knowledge. The program to be taught is

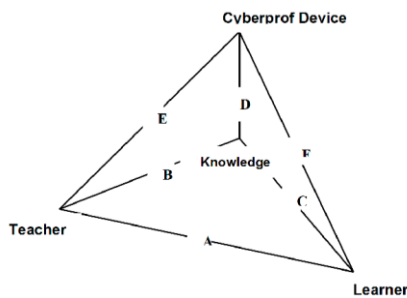
included in the knowledge and according to this theory, the teacher is the one in charge to transmit or make learning knowledge. Regarding the student, s/he acquires knowledge thanks to a pedagogic situation; the relationship between the teacher and the student. As for the didactic relationship is the connection between a teacher with the knowledge that allows him/her to teach. Finally, the learning relationship is established when the student is building knowledge to learn.



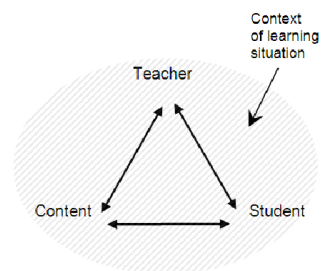
Le triangle pédagogique (Jean Houssaye, 1988)

This traditional approach to the triangle has been criticised due to the lack of information that provides for pedagogical purposes. The first aspect that is criticised is the “reductionistic” aspect. Gruschka (2001) and Herzog (2010) argue that lacks important aspects such as the fact that the student can only learn when teachers teach them, ignoring the factors of time, space and interaction.

Many authors have introduced new elements to the original idea of the didactic triangle, for instance, Lombard introduces a new dimension to the figure, becoming a tetrahedron under the influence of ICT. Another example where the didactic triangle has been used is the one from Kansanen (1999) which is aimed at analysing and describing the entire teaching and learning situation.



The didactic tetrahedron of Lombard (2003)



The Didactic Triangle Kansanen (1999)

Finally, Coll et al (1992a, 1992b, 1995) analysed education from the point of view of a joint activity around a task and/or a specific content. From the constructivist point of view, they were able to coin the notion of *interactivity*; defined as the actions of the teacher and students in a task or an object content of teaching and learning. On the one hand, students build meaning and interpret the sense of school content and on the other hand, the teacher and students build a joint activity through their contributions. Therefore, the student is the one in charge to construct meaning and the teacher has the role of “helping” the student to acquire this meaning. Hence, learning is inseparable from the social and communication process.

3.4 Group work: cooperative, collaborative learning and problem based-learning

3.4.1 Cooperative learning

On the one hand, Davidson and Worsham (1992) describe cooperative learning as follows:

Cooperative learning procedures are designed to engage students actively in the learning process through inquiry and discussion with their peers in small groups. The group work is carefully organized and structured so as to promote the participation and learning of all group members in a cooperatively shared undertaking. . . . Students work together cooperatively in each group to discuss ideas, clarify their understanding, think and reason together, solve problems, make and test conjectures, and so forth. Students actively exchange ideas with one another, and help each other learn the material. The teacher takes an active role, circulating from group to group, providing assistance and encouragement, and asking thought-provoking questions as needed. In each type of small group learning, there are a number of leadership and management functions that must be performed. . . . (pp. xi-xii)

The key contents of this fragment are that students are active in the process of learning, there is an organization and structure in a group so that all members participate. There are functions that must be performed from each member and one of the goals is that they exchange ideas to learn. Finally, the role of the teacher is to offer assistance and asking “thought-provoking” questions as needed.

One of the earliest examples of what we call nowadays “cooperative learning” was in the late 1960s in mathematics. Davidson (1970, 1971) developed and applied a “small group discovery method” where they worked together cooperatively discussing mathematical ideas, developed techniques for solving problems, proved theorems, etc.

Cooperative learning has shown effectiveness in education with positive effects on students. For instance, the development of higher-order thinking skills, self-esteem and self-confidence as learners, intergroup relations, social acceptance, development of interpersonal skills and the ability to take the perspective of another person. These results were from different studies such as Johnson and Johnson (1989), Slavin (1990) and Newman and Thompson (1987). These researches were taken from school level and at some college or university level

3.4.2 Collaborative learning

On the other hand, collaborative learning is defined as:

In most collaborative learning situations, students are working in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product. There is wide variability in collaborative learning activities, but most center on the students' exploration or application of the course material, not simply the teacher's presentation or explication of it. Everyone in the class is participating, working as partners or in small groups. Questions, problems, or the challenge to create something drive the group activity. Learning unfolds in the most public of ways. (MacGregor. 11)

In this case, collaborative learning is more focused on working in groups where they search for answers altogether. Students explore or apply the course material from questions, problems or challenges. In a collaborative project, students can divide their task and later, joint the individual parts to accomplish a common goal while in cooperative learning all members would be held accountable to increase their knowledge of the individual parts. An example of a cooperative approach in class would be the jigsaw method, where materials are divided into different parts and all members are expected to learn all parts of the material.

The volume of research on collaborative learning is much less than cooperative learning, still, there are some such as Cabrera et. Al (2002) found positive effects on the learner's preference, student outcomes and openness to diversity. Also, Tinto, Goodsell and Russo (1993) found how students were more engaged in this type of learning.

2.4.3 Problem-based Learning

Problem-based Learning was developed in the 1960s in the faculty led by Howard Barrows at McMaster University medical school and soon adopted in other universities like The University of Limburg in the Netherlands, the University of Newcastle in Australia and The University of New Mexico in the United States.

PBL is an approach to learning in which problems serve as the context and the stimulus for students to learn course concepts and metacognitive skills. PBL problems are compelling theoretical or practical problems, are based on real situations, and often have more than one right answer or more than one right way to get to an answer. In a PBL classroom, students confront a problem before they receive all of the relevant information necessary to solve it. Students work in teams to define the nature of the problem, to identify what additional resources they need, and to find viable solutions to the problem at hand. Students must generally apply the knowledge they have gained through their research, not only to solve the problem, but also to communicate the results of their findings. Faculty members act as facilitators who guide students by asking probing questions and monitoring group processes. (Major & Eck, 2000, pp. 1-2)

The key aspects of this fragment are that problem-based learning is based on problems of real situations and students must solve them based on their research in addition to the information received in class. In addition, students work in teams and they are guided by faculty members. Extensive research has been carried out to analyse how student's outcomes differ from traditional instruction. For instance, Strovel and van Barneveld (2009) found that PBL students outperformed on professional skills and elaborated essays. In the case of Severiens and Schmidt (2009) found an improvement of student study space as well as social and academic integration. Finally, another example from Albanese & Mitchell (1993) where PBL students have reported that their studies were more engaging, difficult and useful than non-PBL students.

4. METHODOLOGY

The method used for the present study corresponds to a pragmatic approach, as it combines both qualitative and quantitative data, being a mixed-method, but highlighting that most of the collected data are quantitative.

4.1. Participants and context

The research has been conducted in a semi-private school at Escola Pia Nostra Senyora in Barcelona. The school is situated in the centre of Barcelona at 227 carrer de la Diputació. This is the centre where I had my internship training, as part of the Master. The participants were from Second of ESO taking an "itinierari" which is part of the SUMMEM project that offers the school.

SUMMEM is a transversal project, in this case, the project lasted from the 13th of January to the 7th of February. The project was named “Quanta energia necessitem per jugar? Descubrim l’energia que ho mou tot”) and included 15 different activities. 2 out of 15 activities, the 11th and the 12th were in English and lasted one hour each activity. All secondary school teachers were involved in the project regardless of their expertise. The number of students in secondary school in each class ranges from 25 to 30 students and they are divided into two classes, 2nd A and 2nd B. Groups in this project were organized as heterogeneous as possible, so in each group, there was one student highly qualified and another student with learning difficulties. Finally, the remaining two were average students.

4.2 Instruments and data collection process

For the configuration of this research, two different instruments have been prepared with the aim of providing an answer to the objectives; first, questionnaires and second, a question send by email. Qualitative data has been collected through questionnaires whereas quantitative data in the question send to teachers by email. Therefore, data was collected from both students and teachers. On the one hand, students had to answer 12 closed items and 2 open items. On the other hand, teachers answered 7 closed items and 1 (optional) open item except for 2 teachers, where they had 2 different open items. The different questions for those two teachers are due to the fact that the coronavirus pandemic led to the closure of educational institutions. Two questionnaires are different from the rest because two teachers handed them to me physically while others were answered by google questionnaires. Therefore, the ones that were sent on-line, the open question was just ‘optional’ regarding extra comments they wanted to make in relation to SUMMEM (the reason why they were not asked compulsory open items was to facilitate them and design a quick questionnaire). In addition, I send an email to different teachers, and two teachers kindly answered an open question.

In student’s questionnaires, 11 items aimed to recruit the participant’s perception on the basis of the scale of three points depending on the question:

- | | | |
|----------------|---------------|------------|
| a. “Malalment | b. Bé | c. Molt bé |
| a. No | b. Indiferent | c. Sí |
| a. No | b. Mesomenys | c. Sí |
| a. Massa llarg | b. Massa curt | c. Adequat |
| a. Insuficient | b. Excessiu | c. Adequat |

[...]

The open items were in question 10 and the second part of of the question 12.

Question 10: “Com us han avaluat (avaluació continuada/única)? Què és el que han avaluat? Han utilitzat rúbriques per avaluar, us havien dit prèviament com us evaluarien (ensenyament de rúbriques, com ha de ser els treballs perquè siguin excel·lents...)

Question 12: Quina ha sigut la teva experiència d'aquest itinerari? Podries argumentar la teva resposta (un aspecte positiu I un altre negatiu)

In teacher's questionnaires, 6 items aimed to gather their perception on the basis of scale of three points, one with two points and one question with four points:

- a. No b. Indiferent c. Sí
- a. No b. Pocs c. La majoria d. Pocs
- a. No c. Sí

[...]

The two open items were the following:

Question 7: “Com ha sigut el procés de creació de les activitats i el contingut de l'itinerari? Com us heu ficat d'acord amb la resta dels professors?”

Question 8: “Quins han sigut els instruments d'avaluació utilitzats per dur a terme aquest itinerari? Els criteris d'avaluació eran d'avaluació continuada?”

The single open item for the online questionnaire was the following:

“(Opcional) Voldries afegir algun comentari sobre la dinàmica de SUMMEM?”

4.2.1 Questionnaires

In order to guarantee the reliability and validity of the instruments, considering the different research objectives and the age of the students, items were explained and the questionnaires were administered in Spanish, in order to reduce the possibilities of misunderstandings. Questionnaires were anonymous and picked up by myself. They were administered on the 12th of March, just the day before Spain started the quarantine due to covid-19.

Three questionnaires were designed including similar items: one for the students and two for the teachers; the first version of teacher's questionnaires were handed in person while the second version was sent by email. Besides, I had further doubts regarding the teacher's perception so I emailed them to had more feedback detail. The question was the following one:

“m'agradaria saber, quines creus que són les desavantatges/punts febles/inconvenients que has trobat que hi ha quan es fa l'itinerari. (Perspectiva alumnes i/o professors)”. The three questionnaires used in this research appear presented below.

4.3 Data collection

Twenty questionnaires were administered in the second term of the academic year 2019-2020. Specifically, on the 13th of March, a month and a week after they carried out the itinerary SUMMEM.

Some students asked about open item questions, so I clarified any doubts that students had. The questionnaires were answered in class and the time that students took to answer them was approximately three to five minutes. The questionnaires were anonymous and students knew that what they were answering was part of my TFM project.

Regarding teacher's questionnaires, two questionnaires were collected on the 13th of March and the rest, an email with google questionnaire was sent on the 19th of March. Twelve teachers answered back to the email, filling the questionnaire.

5. . RESULTS AND DISCUSSIONS

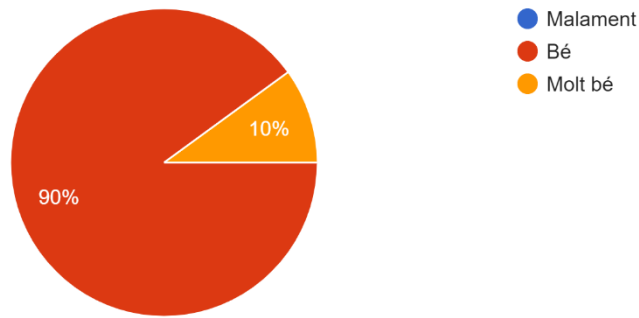
This section aims at presenting and discussing the results of this research in the following order: 1, teachers' perceptions; 2, students' perception. Results are presented according to the objectives of the current research. Each objective is reflected in some items in the given questionnaires.

Regarding the questionnaires, with the aim of presenting meaningful results, the percentage of the vote of each value in the Likert scale has been calculated. Nevertheless, some students did not answer all questions, that is the reason why some questions have nineteen answers instead of twenty.

5.1 Student's perception

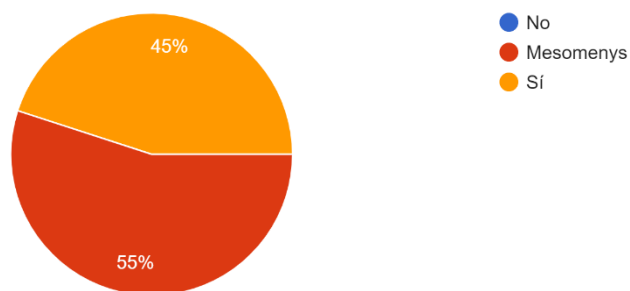
1. Com s'ha integrat la llengua anglesa en l'itinerari?

20 answers



2. El nivell d'anglès era adequat?

20 answers



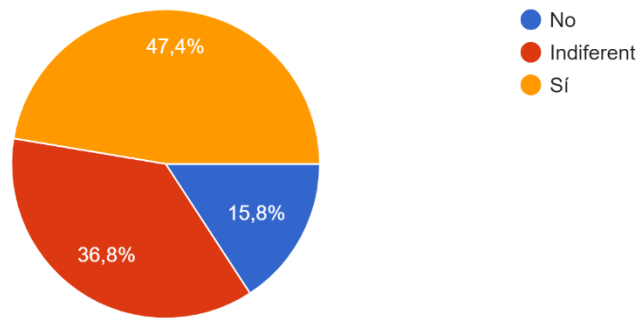
These two questions serve to answer the first objective:

- To observe if students consider that the integration and the level of English have been adequate.

Almost all students agree that English has been integrated into this project correctly, and ten per cent of them agreed that it has been introduced greatly. Regarding the English level used, near half of the students answered that it was suitable, while the rest answered that it was more or less suitable. This last case, it may be due to the fact that some students considered the level either too easy or too difficult depending on the student. Some students asked me what to answer if they found the level too low, and I replied to them to answer “mesomenys”. This last aspect I consider it is difficult to satisfy all student since their level is very different from one student to another. I suppose the level was lowered a little so all students could understand the instructions.

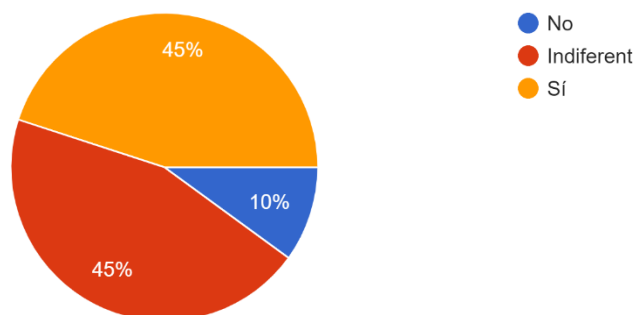
3. Què penses sobre l'itinerari, t'agrada treballar per projectes?

19 answers



4. T'agrada treballar en grups?

20 answers



These two questions answer objective number two, which is:

- To explore whether students enjoy working in projects and working with other students. Also, if teachers think that students are enjoying the activities and working in groups.

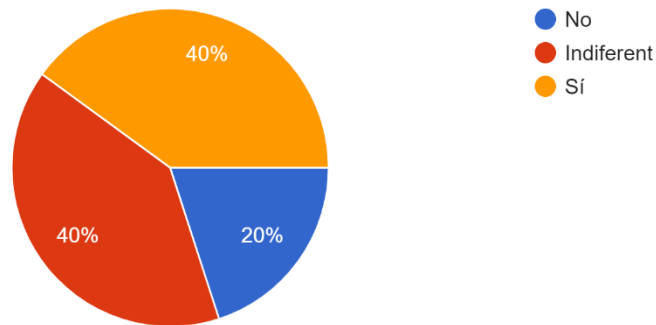
On the one hand, students were asked whether they liked to work in projects and near half of the students answered “yes” and near one-third of them were on the fence regarding whether they like it or not. Finally, fifteen-point eight per cent of the students reported that they did not like it. On the other hand, the fourth question: “do you like working in groups”, the results changed slightly, decreasing the dislike from the students and increasing the numbers of students on the fence. I consider this is a key aspect of this type of work which is to know if students are enjoying it or not since it will influence on the acquisition of new elements.

Students who are against working in groups and do not like working in projects is the small minority (near sixteen per cent and ten per cent respectively). Nevertheless, if students who were in a neutral position and not in favour were significant, near thirty-seven per cent and forty-five respectively in the two questions. Therefore, half of the class seems not to be

enthusiastic about it. I consider that with this result, this aspect should be work on, and try to lessen greatly this percentage

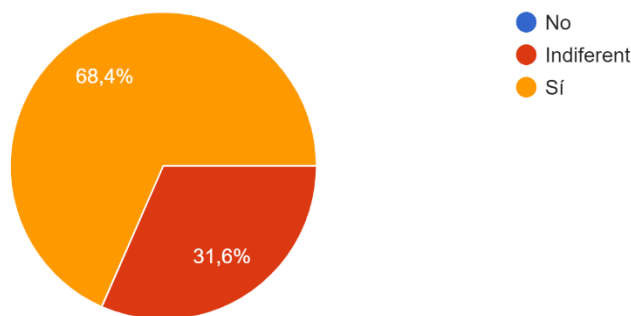
5. Penses que s'aprèn més treballant en grups?

20 answers



6. Creus que és beneficiós pels alumnes que tenen dificultats d'aprenentatge, treballar en grups? (Ja que es poden ajudar els uns dels altres?)

19 answers



Question number 5 and 6 from student's questionnaire corresponds to one part of the third objective of the project which is:

-To analyse if students and teachers perceive that one of the main objectives of working in projects is achieved; students learn more while working in groups.

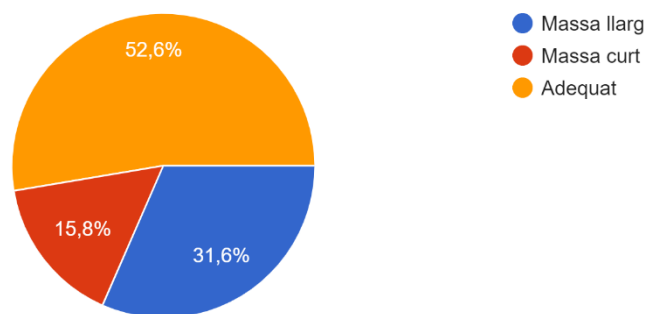
To give an answer to this objective, two questions were formulated. The first question being: "Do you think that you learn more by working in groups?". Forty per cent of students think

that they learn more while twenty per cent did not. The remaining forty per cent are neutral in this question. In contrast, in the following section: “Do you think working in groups is beneficial for students that have learning problems (since they can help each other?), none of the students answered in the negative. Almost seventy per cent of students answered affirmatively while the rest provide a neutral answer.

Feedback provided from question number five shows the lack of information that students have received regarding working in projects. One of the main reasons that working in groups is promoted is because studies have proved to be beneficial to acquire new contents. I consider that students should be aware of this previous aspect. However, if students do know but still some of them consider that they do not learn more, and near half of them remain neutral in this question, possibly, the approach to this method is not correctly applied.

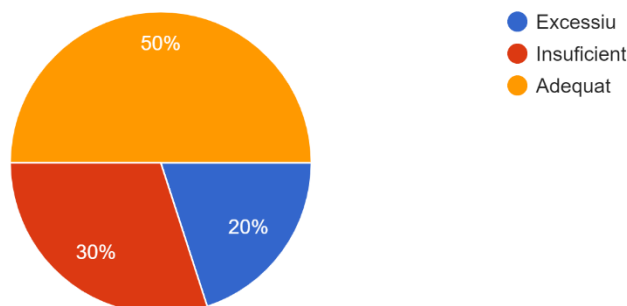
7. Què penses sobre la duració de l'itinerari?

19 answers



8. Què opines sobre el temps ofert en cada activitat?

20 answers



The questions above serve to answer the first part of objective number four:

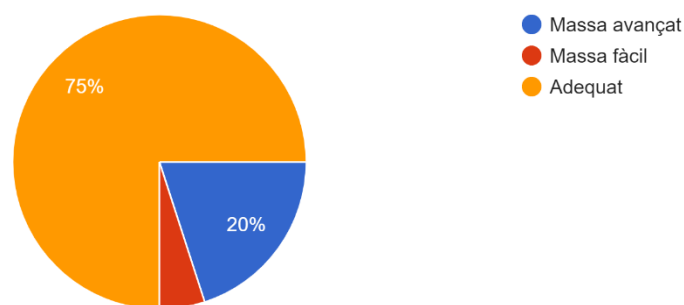
- To consider what is student's viewpoint regarding the length of the project, the activities, the theme and their experience.

Around fifty per cent of the students think that the time offered for each activity and the length of the project has been appropriate. Almost thirty-two per cent think that the length of the project has been too long and twenty per cent, they also think that the time offered for each activity has been excessive. In contrast, almost twenty per cent of students felt the length of the project too short while thirty per cent of the students thought insufficient the time offered for each activity.

Regarding these two questions, it may be difficult to satisfy all students, still, half per cent of students felt to be adequate. Therefore, I consider these results to be positive.

9. Què penses sobre el nivell de les activitats?

20 answers



Question number nine answers a part of objective 4:

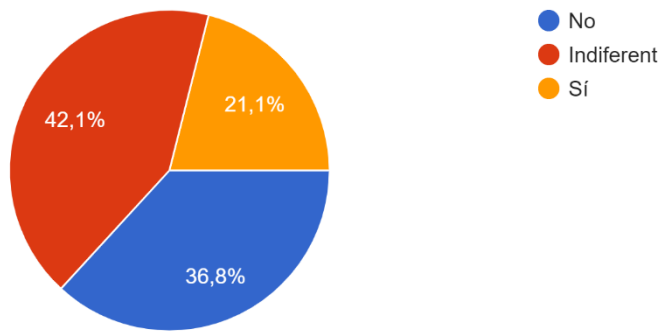
- To consider what is the viewpoint regarding the length of the project, the activities, the theme, the level and their experience.

Seventy-five students considered adequate the activity level and five per cent considered too easy. The rest, the twenty per cent of students thought activities were too difficult.

The feedback received in this question, as the previous two, it is difficult that all students agree. Nevertheless, 75 per cent of students felt it was adequate, which is a very positive result.

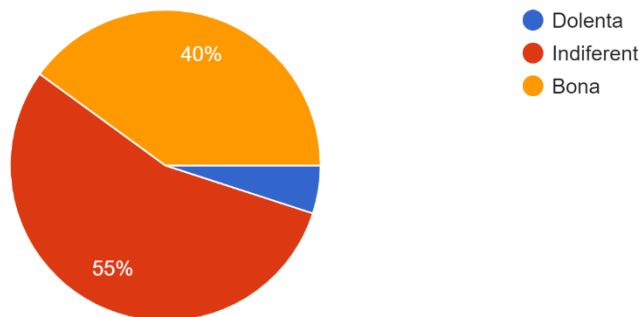
11. T'ha agradat el tema de l'itinerari?

19 answers



12. Quina ha sigut la teva experiència d'aquest itinerari?

20 answers



These last two questions serve to answer the last part objective number 4:

-To consider what is the student's viewpoint regarding the length of the project, the activities, the theme and their experience.

Around twenty-one per cent of students did like the theme project and forty per cent of students reported having enjoyed the itinerary. In contrast, almost forty per cent of students did not like the theme and five per cent of students responded having a bad experience carrying out this project. Finally, about forty-two per cent of students have provided a neutral answer about the itinerary theme and fifty-five per cent of students responded neutral position about having enjoyed the project experience.

Regarding question eleven, I consider to be very high, the percentage of students that did not like the theme of the itinerary, which was near thirty-seven per cent. Still, it may be difficult to satisfy all students, but a measure could be taken to reduce this percentage. Possibly, by

reducing this number, an increment of the number of students that have had a good experience could take place.

Regarding open items, not all students provided a written answer. On the one hand, the first open question was:

- Com us han avaluat (avaluació continuada/única)? Què és el que han avaluat? Han utilitzat rúbriques per avaluar, us havien dit prèviament com us avaluarien (ensenyament de rúbriques, com ha de ser els treballs perquè siguin excel·lents...)?

This was the following feedback:

- Amb rúbriques.
- Han avaluat tot en general.
- Sí ens han dit les coses perquè surtin millor.
- Crec que m'han avaluat normal.
- El treball en equip i feina feta.
- Avaluació continuada, tècniques cooperatives. Si s'havien dit les rúbriques.
- Ens han avaluat amb rúbriques i ens havien dit anteriorment com funcionen.
- Avaluació continuada, el treball, rúbriques.
- Avaluació continuada, com hem treballat. Les fitxes, si i no ho sé.
- Han avaluat el comportament, com m treballat, si em treballat tots junts, etc. I per fer això hem utilitzat rúbriques.
- Han avaluat diferents activitats i ens han donat rúbriques.
- Avaluació continuada, com hem treballat i les fitxes. Si, no ho sé.
- han avaluat diferents activitats.
- Ens han donat rúbriques per avaluar.

On the other hand, the second open item corresponding to question number thirteen and corresponds to objective number five:

-To examine what students think are positive aspects and negative aspects of the itinerary

The question was formulated as: Podries argumentar la teva resposta (un aspecte positiu i un aspecte negatiu)?

The following sentences were the student's answer.

- Perquè he entès coses que no entenia
- El tema a mi no m'ha agradat. Alguna de les activitats que s'han fet m'han agradat
- M'agrada molt el construir la joguina.
- Crec que l'itinerari era normal (bé) però els grups fatal
- M'és indiferent perquè ha estat un itinerari que no tenia un tema interessant però la joguina si ho era
- Negatiu: una integrant del grup no treballava. Positiu: la resta si treballaven
- Les persones que no treballen en grup
- M'ha agradat bastant ja que he pogut conèixer més als meus companys però
- Han sigut més entretingut que aprendre en una classe. Negatiu: quan hi han coses que ens ha costat una mica
- Realment no m'importa l'itinerari només el faig i ja està. No tinc una experiència bona o mala, encara que ha sigut divertit
- M'ha agradat quan construïem la joguina, però quan fèiem les fitxes eren masses
- És millor que la classe normal
- Ha sigut més entretingut que la classe normal, hi han coses que ens han costat
- M'ha agradat perquè he après bastant del tema i treballar en grups. no m'ha agradat perquè no m'ha acabat d'agradar el tema
- El tema estava bé però algunes activitats eren complicades

Regarding the first open question, the fact that students were aware of how they were going to be evaluated, it is positive.

Regarding the second question, positive aspects are the ones that predominate in the comments. The ones that do coincide are that they liked building a toy, that they enjoyed more doing SUMMEM than a regular class, and that they liked the theme of the project. In contrast, negative comments agree that group arrangements were not good and that some of the members did not work.

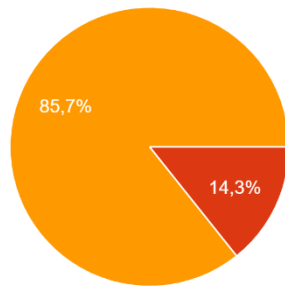
5.2 Teachers' perception

In teachers' perception, two different groups are distinguished; the first group, those teachers who have been in this part of the itinerary or others that have been part of other itineraries. The second group, those teachers have not been part of an itinerary but they know what the project

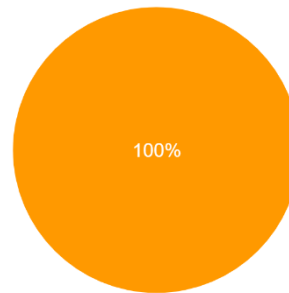
is about. The first's group graphic will be shown on the left and on the right the second group response will be shown.

2. Creus que els estudiants gaudeixen de les activitats?

7 answers



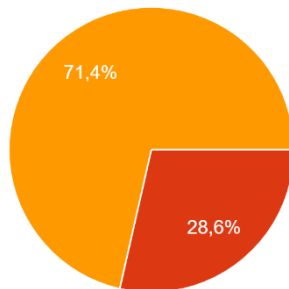
7 answers



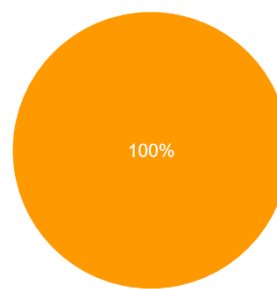
● a. No
● b. Indiferent
● c. Si

3. Penses que els alumnes gaudeixen treballar en grups?

7 answers



7 answers



● a. No
● b. Pocs
● c. La majoria
● d. Tots

Question number two and three corresponds to the second objective:

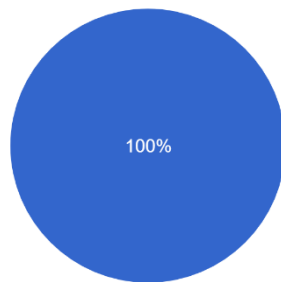
- To explore whether students enjoy working in groups, in projects and what is the teacher's perception of the same matter.

On the one hand, around eighty-six per cent of teachers of the first group considered that students enjoy carrying out the activities of the project while the rest remained in a neutral position in the matter. Regarding the third question, about seventy-one per cent of teachers consider that most students enjoy working in groups while the rest, considered that few students enjoy working in groups. On the other hand, in the second group, all agree that students enjoy carrying out activities of the projects and also that the majority of students like working in groups.

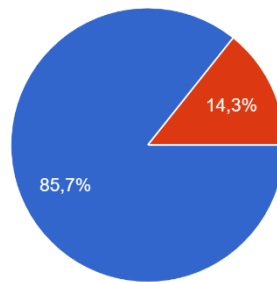
Teacher's perception is slightly different from student's feedback. In the first group of teachers have answered more similarly to student's response. In the first, question, there were more number students being indifferent with activities but since teachers answered "the majority", it coincides of what students have said since the majority also implies that some students did not enjoy it.

1. Què penses sobre l'itinerari, és una bona forma d'adquirir nous coneixements?

7 answers



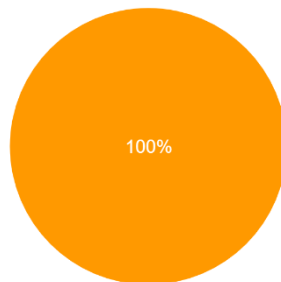
7 answers



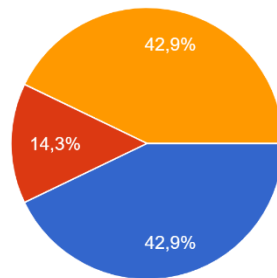
● a. Sí
● b. Indiferent
● c. No

4. Creus que treballar en grups beneficia als alumnes que tenen problemes d'aprenentatge? (Ja que s'ajuden els un dels altres?)

7 answers



7 answers

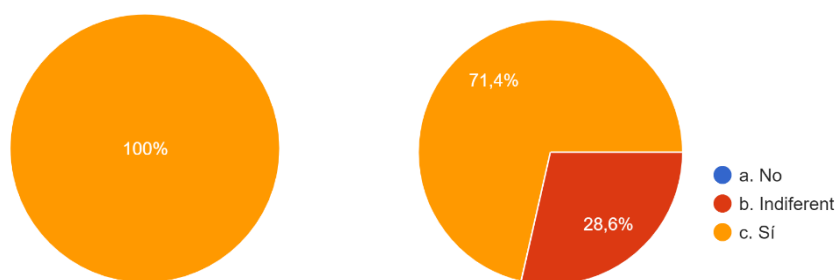


● a. No
● b. Indiferent
● c. Sí

5. Penses que treballar per projectes beneficia als alumnes?

7 answers

7 answers



Number one, four and five from the questionnaire serves to answer objective number three:

- To analyse if students and teachers perceive that one of the main objectives of working in projects is achieved; students learn more while working in groups.

In the first group, teachers agree that the itinerary is a good way to acquire knowledge, beneficial for students in general and also those who have learning problems. In contrast, the second group, almost all teachers agree with the first item but not all of them, and regarding the fourth item, three out of seven teachers responded affirmatively while the other three out of seven responded negatively. The rest, one out of seven provided a neutral answer. Finally, around seventy per cent of the second group consider that working in projects is beneficial for students while the rest positioned themselves neutral.

Regarding these three questions, I consider that it is very positive that all teachers of the first group believe in the main premises of the method which are that it is a good way of acquiring new knowledge, and also, for those students who have learning difficulties is beneficial. The difference between the first group and the second group presents how the instruction of the first group has change teachers' mindset.

Regarding teachers' open questions of the first version (teachers were from the first group), these were the following:

6. Com ha sigut el procés de creació de les activitats i el contingut de l'itinerari? Com us heu ficat d'acord amb la resta dels professors?
7. Quins han sigut els instruments d'avaluació utilitzats per dur a terme aquest itinerari? Els criteris d'avaluació eren d'avaluació continuada?

These were the answers provided for the sixth question:

- Primer es decideix què és el fil conductor I després ens reunim per decidir les activitats I ens les repartim per desenvolupar-les.
- Un petit equip de professors va preparar les activitats de l'itinerari. S'ha explicat a la resta de l'equip docent.

The following are the answers for the seventh question:

- S'avalua el treball durant les sessions I es té en compte l'autoavaluació dels alumnes.
- S'avaluen les activitats concretes i el treball en equip a partir de rúbriques.

Regarding the open question from questionnaire version 2:

(Opcional) Voldries afegir algun comentari sobre la dinàmica de SUMMEM?

- S'aprenen continguts per a la vida, els que es recorden i s'assaja de viure en una societat diversa
- Afavoreix el treball en equip del professorat.

This last aspect is very interesting since, in the past, teachers worked individually and at best, they worked in groups within the same educational areas. Nowadays, in these transversal activities, I think that teachers can learn from each other, by discussing and seeing other teacher's approaches in class.

Finally, the question that I send by email serves to answer the second part of the objective number 5:

-To investigate what teachers consider as weak points of this project.

This is the message send to teachers: Et volia fer una pregunta sobre el treball final de màster que estic fent de l'itinerari. Es parla sempre molt bé dels aspectes positius en treballar en projectes i en grups. Però m'agradaria saber, quines creus que són les desavantatges/punts febles/inconvenients que has trobat que hi ha quan es fa l'itinerari. (Perspectiva alumnes i/o professors)

This is an answer from a teacher that was part of the itinerary:

Per part dels professors

- Saber què és exactament el treball cooperatiu i saber-lo explicar. Els professors que estan dins del projecte SUMMEM sovint no saben ben bé què és o com funciona o per a què es fa treball cooperatiu. Això sovint desllueix la feina tant de la resta de professors com els alumnes, i també confón els alumnes en relació a les tasques (què han de fer i com han de fer-les).
- Temps i organització: Fer bé activitats de treball cooperatiu requereix temps i organització, tant per muntar, en aquest cas, l'itinerari d'aprenentatge (SUMMEM), com per explicar-lo a la resta de professors que hi participen. Això sovint es fa amb poc temps i, en moltes ocasions, no es pot explicar bé l'itinerari i els professors que no l'han muntat, no saben bé com funciona. Un cop més, això és un punt feble donat que els alumnes perceben la confusió.
- Seguiment del treball cooperatiu. Una de les coses més importants del treball cooperatiu és ensenyar a treballar en equip. De poc serveix demanar als alumnes que facin les coses amb tècniques cooperatives si, després, no se'n fa un seguiment detallat i no s'avalua el treball i les tasques de cada membre, així com també s'ha de fer un seguiment del quadern d'equip i dels objectius de l'equip. Si això no es fa bé, els estudiants només treballen en grup però de forma poc cooperativa i eficient.

Per part dels alumnes

Aquesta part la veig més complicada i crec que t'ho hauria de respondre l'alumnat, però et deixo les meves impressions:

- El treball cooperatiu no serveix de gaire, es pensen que perden el temps perquè les tasques no s'avaluen de la forma tradicional i les hores de treball son massa diferents de la forma tradicional que tenen d'aprendre.
- Treballar de forma cooperativa és impossible, sempre hi ha membres del grup que no volen treballar o col·laborar i així sempre acaben treballant els mateixos.

Due to generally positive results from the teacher, I wanted to investigate what were the negative aspects or negative outcomes from this project. This last comment is from one of the teachers who was in charge of the itinerary.

As week points from teachers, s/he points out that not all teachers that are involved in this itinerary have knowledge on what cooperative is and how it works which affects the performance from both teacher and students. In addition, s/he points out that due to the lack of time, teachers who have created the activities do not have the time to explain to other teachers

involved, which affects directly to students since they can perceive some confusion from some teachers. Lastly, s/he points out that students are not always monitored regarding their involvement in the project, their cooperative work, continuous evaluation, etc. This leads students not working cooperatively.

In regards of students, her/point of view is that some students have complaint about members of the group who do not work; therefore, s/he says that they are always the same students who do the task. The other aspect that s/he argues is that students feel like they are wasting their time since the evaluation and the duration is different from the traditional approach. The lack of knowledge of the project SUMMEM, in general, has been discussed in question number 5 and 6 of the students' questionnaire as a hypothesis based on the results. This comment validates what the first impression was which is that students are not given information on what they are working on and why.

This is an answer from another teacher that was part as well from the itinerary:

- Els alumnes més avançats, de vegades es queixen de que al final són ells els que acaben tirant del carro i que per això prefereixen fer les tasques de manera individual, i els alumnes més ganduls doncs continuen així i van a remolc dels altres. Pel que respecte als que tenen més dificultats, s'intenta que les tasques que els hi toquin les puguin fer i així ajudar, en la mesura que poden a l'equip.
- Pel que respecte als professors si ets tu el que prepara l'itinerari doncs el coneixes bé i veus el que va bé o no, i si ets el professors que estàs allà perquè és la teva hora de matèria, no sempre tens molt clar el que toca fer.

Interestingly, the second teacher's comments coincide with what the previous teacher has commented. On the one hand, this second teacher argues as the first teacher, that there are some students who feel the responsibility to be in charge when doing tasks, in this case, this teacher specifies that there are those who are more "advanced". On the other hand, s/he states the same "problem" as the first teacher, which is how some teachers who have not prepared the activities are not sure what they have to do.

6. FINAL CONCLUSIONS, LIMITATIONS AND LINES FOR FUTURE RESEARCH

6.1 Conclusions

The results have given answers to different research questions presented. As far as the first research question, students were satisfied in the way English language and the level was integrated, therefore, in a transversal point of view, the person in charge of English activities did a great job. Nevertheless, I consider that the English present is insufficient if we take into account that there were only 2 activities out of 15 in English.

Regarding the research question number 4, there are not remarkable results except for the chosen theme. I consider difficult to establish a common ground where everyone is satisfied with the length of the project and the time offered, therefore, different degrees of contentment expected. Nonetheless, between fifty and fifty-two per cent of students felt adequate. In my opinion, what it has to be taken into consideration is the chosen theme of the project since nearly thirty-seven per cent of students were not keen on the theme. Letting students have some voice in choosing the theme would encourage their motivation and their enjoyment in the project. For example, letting them decide among different options, the theme they want to work on, or taking into account their opinions for the next year. By letting students have decisions, as mentioned before, the number of students that had a good experience may increase.

According to the second research question, students that are discontent with groups may be due to the fact that groups are created heterogeneously and not taking into account with whom they get along with. Some of the students' comments were that some students did not work and the configuration of groups was terrible which coincides with the perception of the last two teachers who answered by email. As a solution, as the first teacher commented in the email, students should be more monitored closely, tracking the tasks of each member, watching closely their team notebook, etc. In addition, teachers should be more familiarised with what they are doing, in order to monitor them, since these teachers have commented on how some teachers do not know what activities students are doing.

Concerning the third research question is interesting how students in their questionnaire, in the beginning, in the fifth question, there was twenty per cent of students who disagree that students learn more in groups. This changes in the following question, when it is explained that students with learning difficulties can be benefitted with the help of other members of the group. In this last question, none of the students contemplated none beneficial group work. I consider that

students must be informed why they are working in projects. As the first teacher (from the email) pointed out, she had the feeling that students thought they were wasting their time because they were not evaluated in a traditional way and because the way the schedule is organized is very different as well. Therefore, it seems that students do not know why they are doing this type of projects in the first place. That is the reason why I consider key explaining students for instance, why they are doing this type of project, why these groups are organized in that way, why they are learning that content, making it explicit the linkage between their content and their everyday life, etc.

6.2 Limitations and lines for future research

This investigation served to observe how effectively in projects was applied, in this case, SUMMEM from Escola Pia Nostra Senyora. In order to obtain this information, questionnaires and questions by email were used. The kind of data that was collected was oriented to gather students' and teachers' impressions and thoughts on this matter. This is a really small sample to be generalised. Nevertheless, collaboration is lacking from both students and teachers. Teachers seem to lack on time in order to be more coordinated with each other, therefore, I consider that more investment is needed in the education system in order to apply this type of projects.

On the one hand, investment should be reinforced in the education of teachers. I consider to be important and key to be updated with education research. In this particular school, one teacher from each course was the one receiving the information of the changes in the education system and then, this person was in charge to explain to others. In the case of SUMMEM, the ones that were more familiarised with the activities were the ones who designed it and the others, they were in class with students but without knowing what they were working on. A way should be found to find time so all teachers know what are the activities students must follow.

On the other hand, investment should be considered as well into education in general. For instance, as mentioned before, teachers have not enough time to get together and discuss. Therefore, the government should take into consideration and open the possibility of having more teachers at schools. Considering what the first teacher said by email, there is no use to apply this type of projects if it is not properly carried out. I consider that this is a problem from a previous step, which I mentioned before, teachers are not educated and updated. The first step would be to try to have teachers all on the same page, and with the all information necessary to implement anything.

Finally, research to collect data in the efficacy on this type of projects should be carried out since if this is an aspect that is generalised in other centres, they may need to change the approach of the application. If this type of projects is not correctly executed the effect is counter-productive. For instance, as in this research points out, if teachers do not revise the work of every member, this can lead to some of the students significantly more work than others. This situation may cause students to be very demotivated and dislike the experience. Therefore, rethinking and measures should be taken into account in order to have better outcomes. Measures such as more investment in the number of teachers and resources at schools.

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8. ANNEXES

Student's questionnaire

Quanta energia necessitem per jugar? Descubrim l'energia que ho mou tot

1. Com s'ha integrat la llengua anglesa en l'itinerari?
 - a. Malament
 - b. Bé
 - c. Molt bé

2. El nivell d'anglès era adequat?
 - a. No
 - b. Mesomenys
 - c. Sí

3. Què penses sobre l'itinerari, t'agrada treballar per projectes?
 - a. No
 - b. Indiferent
 - c. Sí

4. T'agrada treballar en grups?
 - a. No
 - b. Indiferent
 - c. Sí

5. Penses que s'aprèn més treballant en grups?
 - a. No
 - b. Indiferent
 - c. Sí

6. Creus què és beneficiós pels alumnes que tenen dificultats d'aprenentatge, treballar en grups? (Ja que es poden ajudar els uns dels altres?)
 - a. No
 - b. Indiferent
 - c. Sí

7. Què penses sobre la duració del itinerari?
 - a. Massa llarg
 - b. Massa curt
 - c. Adequat

8. Què opines sobre el temps ofert en cada activitat?
 - a. Insuficient
 - b. Excessiu
 - c. Adequat

9. Què penses sobre el nivell de les activitats?

- a. Massa avançat b. Massa fàcil c. Adequat

10. Com us han avaluat (avaluació continuada/única)? Què és el que han avaluat? Han utilitzat rúbriques per avaluar, us havien dit prèviament com us avaluarien (ensenyament de rúbriques, com ha de ser els treballs perquè siguin excel·lents...)?

11. T'ha agradat el tema de l'itinerari?

- b. No b. Indiferent c. Sí

12. Quina ha sigut la teva experiència d'aquest itinerari?

- c. Dolenta b. Indiferent c. Bona

Podries argumentar la teva resposta (un aspecte positiu i un aspecte negatiu)?

Teacher's questionnaire (1)

Itinerari aprenentatge: Quanta energia necessitem per jugar? Descubrim l'energia que ho mou tot

1. Què penses sobre l'itinerari, és una bona forma d'adquirir nous coneixements?

- a. No b. Indiferent c. Sí

2. Creus que els estudiants gaudeixen de les activitats?

- a. No b. Indiferent c. Sí

3. Penses que els alumnes gaudeixen treballar en grups?

- a. No b. Pocs c. La majoria d. Tots

4. Creus que treballar en grups beneficia als alumnes que tenen problemes d'aprenentatge?
(Ja que s'ajuden els un dels altres?)

- a. No b. Indiferent c. Sí

5. Penses que treballar per projectes beneficia als alumnes?

- a. No b. Indiferent c. Sí

6. Com ha sigut el procés de creació de les activitats i el contingut de l'itinerari? Com us heu ficat d'acord amb la resta dels professors?

7. Quins han sigut els instruments d'avaluació utilitzats per dur a terme aquest itinerari?
Els criteris d'avaluació eren d'avaluació continuada?

Teacher's questionnaire (2)

8. Què penses sobre l'itinerari, és una bona forma d'adquirir nous coneixements?

- a. No b. Indiferent c. Sí

9. Creus que els estudiants gaudeixen de les activitats?

- a. No b. Indiferent c. Sí

10. Penses que els alumnes gaudeixen treballar en grups?

- a. No b. Pocs c. La majoria d. Tots

11. Creus que treballar en grups beneficia als alumnes que tenen problemes d'aprenentatge?

(Ja que s'ajuden els un dels altres?)

- a. No b. Indiferent c. Sí

12. Penses que treballar per projectes beneficia als alumnes?

- a. No b. Indiferent c. Sí

(Opcional) Voldries afegir algun comentari sobre la dinàmica de SUMMEM?

-
- Activity 11 and 12 from the itinerary

RECORD CHART

	FLOOR	SURFACE #2
Trial 1 (90cm)		
Trial 2 (90cm)		
Trial 3 (90cm)		
Average #1:		
Trial 1 (cm)		
Trial 2 (cm)		
Trial 3 (cm)		
Average #2:		
Trial 1 (cm)		
Trial 2 (cm)		
Trial 3 (cm)		
Average #3:		

FINAL ACTIVITY



Després de l'experiment, feu la següent activitat utilitzant la tècnica del llapis al mig.

What forms of energy did you observe in this experiment?

Take a blank sheet of paper and draw a diagram of the energy transformation process in this experiment. Use key words and drawings.

GLOSSARY

turn into	convertir-se	hold	aguanta
both	les dues	high	alt
bouncing	que rebota	drop	deixar caure
bounces	rebota	chart	graella
rebounds	torna a botar	reaches	arriba
measuring tape	cinta mètrica	step	passes (a seguir)
surface	superfície	average	mitjana
extend	estendre	height	alçada

	<p style="text-align: center;">ITINERARI APRENTATGE Quanta energia necessitem per jugar? Descobrim l'energia que ho mou tot</p> <p>Alumne/a: _____ Grup: _____</p>	 <p style="text-align: center;">2n ESO</p>
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ACTIVITAT 12 (1 hora)	L'ENERGIA HO MOU TOT	FD
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EXPERIMENT #2 Bubbling Up

(Check the glossary for the underlined words that you don't understand.)

Lots of things we use every day are classified as chemicals. In this experiment, we'll watch energy transform when we mix two different chemicals together. Let's see!

Materials:

- measuring spoons
- hermetic plastic sandwich bag
- white vinegar
- baking soda
- lab thermometer

Steps:

1. Give a number to each member of the group (student 1, student 2, student 3, student 4).
2. **Student 1:** Measure 1 teaspoon (5 ml) of vinegar and pour it into an empty plastic bag.
3. **Student 2:** Touch the bag. Do you feel anything about the temperature of the vinegar? Now, take the temperature with the thermometer.
4. **Student 3:** Write down in the record chart the temperature of the vinegar.
5. **Student 4:** Measure 1 teaspoon (5 g) of baking soda and add it to the bag. Mix everything softly by squeezing the bag. What do you observe when the chemicals mix?
6. **Student 2:** After 30 seconds take the temperature again. Has it changed?
7. Close the bag and feel the mixture. Does it feel the same as before?

RECORD CHART

	BEFORE MIXING	AFTER MIXING
Temperature		

WHAT HAPPENED?

Explanation

Chemical reactions take place when one chemical combines with another to form a new substance with different properties. Any time you mix two chemicals together to create a chemical reaction, thermal energy (heat) can be involved as the reaction takes place. Reactions can be endothermic or exothermic.

“Endo” means “in”, “exo” means “out” and “thermal” means “heat”.

In an endothermic reaction, the thermal energy goes in (it’s absorbed), but in an exothermic reaction, the thermal energy goes out. (it’s released).



FINAL ACTIVITY

Després de l’experiment, contesteu les següents preguntes mitjançant la tècnica del llapis al mig. Podeu contestar en anglès o en català.

1. Taking into account everything that you have seen and learned, what did you observe in this experiment?
2. What forms of energy did you observe?
3. What type of reaction took place in your experiment, endothermic or exothermic?

GLOSSARY			
spoon	cullera	pour	abocar
hermetic	hermètica	empty	buida
bag	bossa (de plàstic)	chart	graella
baking soda	bicarbonat	softly	suaument
teaspoon	cullerada	squeeze	apretant, tocant

- The calendar of the itinerary

	ITINERARI APRENTATGE Quanta energia necessitem per jugar? Descobrim l'energia que ho mou tot	 2n ESO Curs 19-20
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CALENDARI

SETMANA 13 A 17 GENER

dia	DIMARTS 14	DIMECRES 15	DIJOUS 16	DIVENDRES 17
fitxa	Presentació vídeos Activitat 1	Activitat 2 + Activitat 3	Activitat 4 + 5	Activitat 5+ Diari de sessions+ Carrera cotxes
lloc	aula	aules	aules	Aules + passadís/pati
material	fitxes	fitxes	Fitxes + mat. Cotxe + ordinadors	Fitxes + cotxe + ordinadors
classroom				
professorat	Esther Sandra Sandra Lluís Lluís Irene	Helena Sandra Anna S Lluís Mercè Esther	Esther Esther Carme Sandra Lluís Lluís	Sandra Meritxell Lluís Lluís Carme Esther

SETMANA 20 A 24 GENER

dia	DIMARTS 21	DIMECRES 22	DIJOUS 23	DIVENDRES 24
fitxa	Activitats 6 i 7	1 grup a l'aula fa la 8 + 11 2 grups al taller de tecnologia, la 9	2 grups a l'aula fan la 8 + 11 1 grup al taller de tecnologia, la 9	Activitat 10 i 10' + quadern equip i diari sessions
lloc	Aules + informàtica 2a hora	Aules i tallers	Aules i Tallers	Aules + INFORMÀTICA
material	fitxes	fitxes	Fitxes + FULL FITXES EN GRAN	Fitxes Diari de sessions + Q.d'equip
classroom				Foto croquis
professorat	Esther Sandra Sandra Lluís Lluís Irene	Helena Sandra Anna S Lluís Mercè Esther	Esther Esther Carme Sandra Lluís Lluís	Sandra Meritxell Lluís Lluís Carme Esther

SETMANA 27 GENER A 31 GENER

dia	DIMARTS 28	DIMECRES 29	DIJOUS 30	DIVENDRES 31
fitxa	Activitat 13	Acabar 11 i fer 12 + diari sessions	Activitat 14 continuació	Activitat 14 continuació + Diari de sessions
lloc	Aules	Aules	Aules/Taller	Aules
material	Fitxes	fitxes	Fitxes	Fitxes
classroom				
professorat	Esther Sandra Sandra Lluís Lluís Irene	Helena Sandra Anna S Lluís Mercè Esther	Esther Esther Carme Sandra Lluís Lluís	Sandra Meritxell Lluís Lluís Carme Esther

SETMANA 3 A 7 FEBRER

dia	DIMARTS 4	DIMECRES 5	DIJOUS 6	DIVENDRES 7
fitxa	Activitat 14 continuació	Activitat 15 continuació	Activitat 15 continuació	Final itinerari + quadern d'equip
lloc	Aules/taller	Aules/Taller	Aules/Taller	
material	fitxes	Fitxes	Fitxes	Diari de sessions + Q.d'equip
classroom		Instrucciones		
professorat	Esther Sandra Sandra Lluís Lluís Irene	Helena Sandra Anna S Lluís Mercè Esther	Esther Esther Carme Sandra <i>Lluís</i> Lluís	Sandra Meritxell Lluís Lluís Carme <i>Esther</i>