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TED MASTER'S DEGREE

**The learning
process as a
cooperative
task among
teachers and
students**



Màster oficial formació de professorat d'educació
secundària obligatòria i batxillerat, formació
professional i ensenyaments

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**To Roger,
for his unconditional support throughout this year**

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Abstract

Abstract: This dissertation gathers several ideas and guidelines on professional improvement as a teacher. This study includes two empirical studies. The first one focuses mainly on the teacher's figure. It is meant to be a study of the several resources that the teacher uses in order to construct the student's knowledge in an English classroom context. Furthermore, it represents an approach to learning as a cooperative task among teachers and students. The second empirical study focuses on the students. It is a study on how students learn cooperatively by analyzing their oral productions when working in small groups. The following section introduces a personal approach to all the experiences and feelings the trainee-teacher has lived, mainly during her two practicum periods, considered as a process of professionalization. To conclude this dissertation, a summary of the major findings and the possible areas for future improvement are included.

Key words: Content and Language Integrated Learning (CLIL), content-based, interaction, non-verbal communication, construction of knowledge, cooperative learning.

Resumen: Esta disertación recoge diversas ideas y guías sobre el desarrollo profesional del profesor. Este trabajo incluye dos estudios empíricos. El primero está focalizado en la figura del profesor. Este pretende ser un estudio sobre los diferentes recursos que el profesor utiliza para construir el conocimiento incorporando a los estudiantes en el contexto del aula de inglés. Además, representa un acercamiento al aprendizaje como una tarea cooperativa entre profesores y estudiantes. Por otro lado, el segundo estudio empírico se centra en los estudiantes. Se trata de un estudio sobre como los estudiantes aprenden cooperativamente mediante el análisis de sus producciones orales cuando trabajan en pequeños grupos. La siguiente sección introduce un acercamiento personal a todas las experiencias y los sentimientos que la profesora en prácticas ha vivido principalmente durante sus dos períodos de prácticas, considerados como un proceso de profesionalización. Para concluir esta disertación, se incluye un resumen de los principales hallazgos y de las posibles áreas para futuras mejoras.

Palabras clave: Aprendizaje Integrado de Contenidos y Lengua (AICLE), aprendizaje por contenidos, interacción, comunicación no verbal, construcción del conocimiento, aprendizaje cooperativo.

0. Introduction

The amount of time spent during these last months in a secondary school and the observation of the students' reactions have been immensely useful for the trainee-teacher in order to realize something she already had a notion of. As of 2010, secondary school students are not the same as they used to be five, ten or fifteen years ago. These students have changed as society has greatly developed. Therefore, the way of teaching has to be different from what it used to be in the past. At the moment, becoming a good teacher implies something else that goes beyond the fact of mastering the subject one is going to teach. Teaching at a secondary school nowadays is a demanding and challenging task, and one has to be willing to motivate and encourage students to learn.

Consequently, as the two empirical studies included in this dissertation show, the trainee-teacher has modified her focus of observation from the teacher to students. The trainee-teacher has realized that the main characters in the play of the classroom are the students, what they learn and how they learn it. From her point of view, the teacher's role is guiding students and being able to interest the students and encourage them to continue learning in the future.

The research context of these two studies is explained in the following section (section 1). There, a description of the school and the students who had been the focus of the analysis can be found. Then, the global objectives of the dissertation are covered (section 2), followed by the theoretical framework of the two small scale empirical studies and an explanation of the methodology applied (sections 3 and 4). Afterwards, section 5 covers the analysis of the two small empirical studies developed from a data corpus, enclosed as appendixes.

The next section (5), corresponds to the trainee-teacher's personal approach to all the practices and feelings she has experienced throughout the course, but mainly during her two practicum periods. This overall reflection aims at focusing on the process of the trainee-teacher professionalization. To finish this dissertation, the trainee-teacher presents her conclusions as a summary of her major findings and moreover, the possible areas for future improvement (section 6). Finally, the references (7) and the appendixes (8), which the video and audio transcriptions used in both studies can be found.

1. Context

1.1. The school

The video and the audio recordings analyzed for the two empirical studies included in this dissertation were recorded at Institut Garona¹. This is the only secondary school in this town and it was founded in 1994. This year, there are approximately more than 600 students and 66 teachers. In this secondary school they offer ESO and Batxillerat (specifically there are 5 classes in 1st ESO, 5 in 2nd ESO, 5 in 3rd ESO and 4 in 4th ESO. In Batxillerat, there are 3 groups in 1st and 2 groups in 2nd).

Garona is located in the middle of Vallès Occidental region. The socioeconomic and cultural level of the students and their families is medium-high. And the number of immigrants (newcomers) is very low, less than 1%. Therefore, the most spoken languages are Catalan and Spanish.

It is also important to mention that this school is involved in the PELE (Projecte Educatiu Llengües Estrangeres) project that is based on the use of a foreign language to work on the curriculum of other subjects. The central objective of this project is to improve the students' linguistic competence in the third language (English in this case) by means of giving curricular content blogs in the foreign language (CLIL). Moreover, this year the English Department has a Language Assistant who helps in the English and CLIL classes.

1.2. The students

The students who appear in the audio and video recordings are a group of 4th ESO. They are mainly 15-16 year old students, although some of them are nearly 18 because they are retaking the course.

It is relevant to mention that this specific group is fairly heterogeneous. Some of the students attend English extracurricular classes and their level of competence by the majority ranges would be an A1/A2 COE level according to the Common European Framework. On the other hand, some students show a quite low level of competence. Nevertheless, they are used to following these classes only in English. L1, Catalan, is only used in very specific moments; generally when it is necessary to translate something that has not been understood.

¹ Garona is the secondary school nickname.

2. Global objective of the dissertation

The objective of this dissertation is the professional development of the trainee-teacher as she tries to become a better educator. She has taken into account everything she has learnt throughout the theoretical courses, all she has read and written, her own practical experience teaching at the secondary school and the observation of other teachers' performance.

Regarding the two empirical studies included in this dissertation, as she has already mentioned, the initial one is focused on the teacher's figure. The purpose of this primary study was to draw the attention to the strategies that the teacher uses in order to establish the target content. This helps her involving students in the conversation. The trainee-teacher was particularly interested in demonstrating the importance of all the extra resources, besides language itself, that the teacher uses leading to the construction of knowledge. The trainee-teacher takes especially into account students and the understanding of the development of the class as a cooperative task.

So, the research questions on which the teacher focuses her attention are the following:

- How is communication and participation achieved among the two co-teachers and the students?
- Which resources does the teacher use?
- How do the elements of the non-verbal behaviour help the teacher to achieve her goals in class?

Subsequently, the topic of her second research was cooperative learning, shifting the focus from the teacher to students. This time, the objective was to observe how students negotiate and cope with the new information through team work.

To achieve these goals, this study poses the following research questions:

- Does this activity favour the learning of students with different characterization and learning profiles?
- How does the feeling of success influence students learning and motivation?

3. Theoretical framework

The main purpose of this section is to deal with some authors and theories that have previously studied the aspects the trainee-teacher is considering in the small empirical studies.

The first empirical study focuses on the following topic: “How does the teacher use her resources to construct the knowledge incorporating the students in an English classroom context?. An approach to learning as a cooperative task among teachers and students and the usefulness of the non-verbal language”.

Firstly, there is an approach to communication from a socio-cultural perspective and the importance of considering all the elements of communication that are also involved in the classroom context (point 3.1.).

Afterwards, there is a summary of different authors' approaches that have considered the construction of knowledge as an interaction between the teacher and the students and how learning is achieved bearing in mind these opportunities of interaction. Moreover, the strategies and the techniques the teacher uses to guide the construction of knowledge, starting with her speech. Regarding this point, the general communication acts carried out by teachers in the classroom context (point 3.2.).

Finally, there is an attempt to show the importance of the paralinguistic and non-verbal resources the teacher has to develop and use to support her speech (point 3.3.). All these tools assist the teacher to achieve a richer construction of knowledge.

3.1. Communication as a socio-cultural approach

The social communication theory has demonstrated that it is not possible to investigate the communication isolating it in only one channel. Because of that, as human beings, we emit a great amount of information consciously or unconsciously, that is suitable to be captured by the others. So, in an interaction system it is not probable to avoid communicating (Forner, 1987).

Specifically, and according to Mercer (2004), many human activities involve not just sharing information and the coordination of social interaction, but also an active engagement with the ideas among partners.

As Mercer (2004) points out regarding the field of the socio-cultural research: “communication, thinking and learning are related processes which are shaped by culture” (p. 138). Therefore, Mercer affirms that the nature of human activity is that knowledge is shared and people jointly construct understandings of shared experiences.

3.2. The construction of knowledge

Accordingly, Mercer (1995) states that thinking of ‘knowledge’ only as an individual mental possession does not do justice to the capabilities of human beings. In this sense, he introduced the idea of a ‘social mode of thinking’. Mercer said that teachers may withhold explanations because they want the students to ‘think for themselves’. Following this idea, and citing Vygotsky words, Mercer wrote that learner’s actual achievement is never just a reflection of individual’s inherent ability, but it is also a measure of the effectiveness of the communication between a teacher and a learner.

Allwright and Bailey (1991), citing other previous authors who had already discussed about this topic, also dealt with the idea of the class as a constant interaction. For them, the success of this constant interaction in the classroom cannot be taken for granted and it cannot be guaranteed just by exhaustive planning either. They argued that if the interaction is totally planned in advance then the result is a play-reading, rather than a class.

Regarding a lesson, Allwright and Bayley (1991) pointed out that everyone has to take part in a class and everything depends on the learner’s cooperation. In the authors’ words, in choosing to co-operate (or not), the learners make a significant contribution to the management of the interaction that takes place in the classroom. Moreover, they wrote that these contributions are crucial to the success of the interaction, and to the success of the lesson itself as a social event.

At the same time, Allwright and Bayley (1991) emphasized that what happens in the classroom is crucial to language learning because what happens determines what learning opportunities learners get. Finally, they described three outcomes regarding whatever actually happens in language lessons: the ‘input’ provided for learning, the ‘practice opportunities’ provided, and the effects on the ‘receptivity’ of the learners.

3.2.1. Guidance strategies

Regarding Mercer (1995), he offered some techniques used by teachers to the guided construction of knowledge. Mercer said that teachers in schools and other educational

institutions use language to pursue their aims using three things: a) elicit relevant knowledge from students, so that they can see what students already know and understand and so that the knowledge is seen to be 'owned' by students as well as teachers; b) respond to things that students say, not only so that students get feedback on their attempts but also so that the teacher can incorporate what students say into the flow of the discourse and gather students' contributions together to construct more generalized meanings; c) describe the classroom experiences that they share with students in such a way that educational significance of those joint experiences is revealed and emphasized.

3.2.2. Classroom talk

Chesterfield and Chesterfield (1985, cited by Allwright and Bailey, 1991) developed a taxonomy of verbal learning strategies regarding their observational research on students on bilingual classes. The categories related to classroom participation include the following (Chesterfields, 1985, cited by Allwright and Bailey, 1991)²:

- Repetition (imitation of a word modelled by another, or incorporation of words)
- Use of formulaic expressions (phrases which function as unanalyzed automatic speech units for the speaker)
- Verbal attention getter (the speaker attracts the attention of another to initiate interaction)
- Answer unison (response by providing the answer aloud together with others)
- Elaboration (provide information necessary to carry on the interaction)
- Anticipatory answer (guess from the context to provide a response for an anticipated question)
- Appeal for assistance (spontaneously asking another for help)
- Request for clarification (attempt to broaden understanding. Ask the speaker to repeat)
- Role play (spontaneous practice of the target language in interaction with another)

At the same time, Stubbs (1983) suggested that teachers constantly check to see if they are on the same wavelengths as their pupils.

² Adapted from: Chesterfields, 1985, cited by Allwright, D. and Bailey, K. (1991) *Focus on the Language Classroom*. Cambridge: Cambridge University Press.

More specifically, this author pointed out the subsequent aspects³:

- Attracting or showing attention. A teacher constantly makes remarks to attract or keep the attention of the pupils and to prepare them for the message to come.
- Controlling the amount of speech. Teachers frequently exert control simply over whether pupils speak or not.
- Checking or confirming understanding. Teachers may check or confirm whether they have understood a pupil or not .
- Summarizing. Teachers often summarize something that has been said or read, or summarize a discussion or lesson; or they may ask a pupil to give a summary.
- Defining. A teacher may offer a definition or reformulation of something. Or teacher may ask a pupil to give a definition, or to clarify something.
- Editing. Teachers may comment something a pupil has said or written, implying a criticism or value judgment of some kind.
- Correcting. They may actually correct or alter something a pupil has said or written, either explicitly or by repeating the 'correct' version.
- Specifying topic. Finally, the teacher may focus on a topic of discussion.

Because of that, in a classroom, the speaker and the listeners have visual contact and they truly interact. Students have the opportunity to ask questions, to indicate their confusion, or to request clarification or repetition. These are all features of face-to-face interaction, as Allwright and Bailey as well (1991) pointed out.

Nevertheless, also according to Allwright and Bailey (1991), not all forms of participation are always observable. "Participation, or more specifically, 'engagement' (sometimes called 'involvement' or 'investment') which the language learning task at hand, may in some instances be largely an internal, mental phenomenon" (p.129).

³ Adapted from: Stubbs, M. (1983) *Discourse Analysis. The Sociolinguistic Analysis of Natural Language*. Oxford: Basil Blackwell Publisher Limited.

3.2.3. Interaction and proficient learners

Taking a close look to the relationship between learner participation and learning, a study carried out at the end of eighties (Slimani, 1987, cited by Allwright and Bailey, 1991) regarding these perspectives, concluded that the more proficient learners seemed to be, the more willing they were to interact. Maybe because, according to Slimani (1987, cited by Allwright and Bailey), they were more proficient and therefore found interaction less stressful.

In Slimani's opinion, (1987, cited by Allwright and Bailey, 1991) the most proficient learners interacted more frequently than their less proficient classmates, and apparently participation was relatively profitable for them. On the other hand, for the less proficient learners it appeared that listening to other learners was more profitable than participating verbally themselves.

As a conclusion, Allwright and Bailey (1991) said that teachers can investigate their own turn distribution patterns and the ways in which the learners in their classrooms get (or avoid) turns. The authors also added that by systematically speaking less, waiting longer after raising a question, or calling on learners who might have previously ignored, different patterns of behaviour emerge.

Finally, Allwright and Bailey (1991) reinforced the idea of how teachers' participation in negotiated discourse influences the type of practice and learning opportunities that result, and the fact that apparent passive students in classrooms can hide a great deal of active attention avail this theory.

In conclusion, I consider that it is basic to emphasize the idea of how important the cooperation and the students' contributions are in the management and the development of the interaction in the classroom context. Moreover, the learning opportunities the students get in the progress of this interaction. Therefore, teachers should take into account how much they speak and the chances they offer students to actively participate in class. It would be also desirable to analyse, as Mercer (1995) describes, which strategies teachers use to elicit relevant knowledge from the students and how they incorporate the students in the classroom discourse.

3.3. The importance of non-verbal communication

The term non-verbal conveniently draws attention to those aspects of human communication which are non-language and that are often overlooked as part of the total process, according to Cazden, John and Hymes (1972). In the authors' words, it is not

possible to discuss non-verbal communication by translating non-verbal messages into words⁴.

Besides, Cazden, John and Hymes (1972) said that the verbal and non-verbal parts of the discourse are closely interrelated. "When a person is speaking, his head and often other body parts move to mark the stresses in his speech, and his gestures or body movements mark off phrases, sentences,...) (p. 9).

Kendom (1980, cited by Castañer, 1994) considered that the body language reflects the way in which the verbal statements are organized.

According to Castañer (1994), teachers usually tend to easily incorporate those aspects as the eye movement, the facial mime, the plasticity of the body movements, rather than the concepts verbally conjugated⁵.

Moreover, teachers are for students a body and sonorous actor from who they discover the intentions and the attentions, mainly because of the position and the gestures that accompanied the teacher's discourse (Castañer, 1994).

3.3.1. Non-linguistic aspects of the discourse

Forner (1987) said that in the classroom the non-linguistic elements of the verbal expression have various functions: order the action, describe the behaviours, clarify the verbal content, etc. And also, they are a consequence of the social learning. The author referred to the rhythm, articulation, vocalization, stresses, tone of voice, laughing, pauses and even errors or lapses.

3.3.2. Body orientation and gestures

According to Forner (1987) the body position is considered a less controlled aspect regarding individuals in interaction. He added that the body orientation and attitude is a communicative exponent of great value in the school context. Citing also Forner (1987), "The general attitude of the body transmits interesting information about the willingness or unwillingness to participation, or about the degree of attention or not attention. At the same

⁴ Besides the written transcript, the video helps the teacher to analyse her facial expressions, gestures, personal styles of movement, the distance between the teacher and the students and between the teacher and the resources she uses (regarding the Power Point).

⁵ So far, the main idea is that the teacher uses the non-verbal resources to make the students participate with her and to engage them into the communication process.

time, the teacher usually positions the body towards certain students, as a non-verbal sign of approval or disapproval” (p. 30)⁶.

Furthermore, the non-verbal communication is studied taking into account the gestures. For example, the head or hand movements may indicate linguistic signs or emotional states. In addition, other indicators as assertions, refusals or doubts (Forner, 1987).

The second small empirical study is entitled “From ‘Això és impossible’ to ‘deixaré el llistó alt’: a close look to cooperative learning in the English classroom”⁷ and focuses on the use of cooperative learning in the ESL classroom.

The concepts of cooperative learning and collaborative learning are extensively used in the teaching of many subjects. Incidentally, they are particularly significant in the foreign or second language (L2) classroom. At first, the distinction between these two concepts may seem unexpectedly blurry due to the common usage of these terms. However, each has developed different connotations and applications in the classroom in recent years.

3.4. Cooperative learning and the L2 classroom

Cooperative learning refers primarily to an array of highly structured goals and techniques for learning (Oxford, 1997). It can be defined as teaching arrangement in which small, heterogeneous groups of students work together to achieve a common goal. Students encourage and support each other, assume responsibility for their own and each other's learning, employ group related social skills and evaluate the group's progress (Dotson, 2001). The general consensus is that cooperative learning can and usually does result in positive student outcomes in all domains (Johnson & Johnson, 1999).

Kagan & Kagan (1992) describe four basic principles of cooperative learning as the following: Positive interdependence, Individual accountability, Equal opportunities and Simultaneous interaction. Cooperative learning has been implemented in classrooms with different student profiles primarily as a mean of encouraging positive student interaction. The acronym PIES was developed by participants in the 1993 Facilitators Institute in Newport Beach, California to refer to these principles (Brody & Davidson, 1998).

⁶ Translated from: Forner (1987) *La comunicació no verbal. Activitats per a l'escola*. Barcelona: Editorial Grau de Serveis Pedagògics.

⁷ “Això és impossible” (Catalan) means “This is impossible”. “Deixaré el llistó alt” (Catalan) means “I will make the standard higher”.

- Positive interdependence occurs when gains of individuals and teams correlate positively. It would be understood by students as a “your gain is my gain” feeling, thus fostering help among students and supporting the group cohesion.
- Individual accountability requires that all students are actively involved and become responsible for their own learning. This implies that each student is in charge of a share of the work and each share is key for the success of the group.
- Equal participation takes place when all students have the opportunity to contribute and participate actively in their teams. This entails that all students have a chance for growth simultaneously during the activity.
- Simultaneous interaction refers to the fact that in cooperative learning all the students interact during the period of time that the activity lasts.

According to Kagan (1994), “Grouping is essential to cooperative learning. The most widely used team formation is that of heterogeneous teams, containing a high, two middle, and a low achieving student and having a mix of gender and ethnic diversity that reflect the classroom population. The rationale for heterogeneous groups argues that this produces the greatest opportunities for peer tutoring and support as well as improving cross-race and cross-sex relations and integration. Occasionally, random or special interest teams could be formed to maximize student talents or meet a specific student need” (p. 6:1).

The factors which contribute to achievement effects of cooperative learning are group goals and individual accountability. Providing students with a prize increases the probability that all group members will encourage each other, thus creating a better learning opportunity for all students. Furthermore, there is strong evidence that the motivation of students is boosted when group grades and team rewards are introduced in the activity (Slavin, 1990). Regarding the efficiency of cooperative learning task, many studies have been conducted on the conversation among students in the same team. Students may use their thinking, communication, and information-sharing skills to increase their content knowledge as well as their interpersonal skills. Pica et al., (1996) point out that “learners working together in groups were found to display greater motivation, more initiative, and less anxiety regarding their learning, they were found to produce more language. It also contained a greater number of features believed to assist message comprehensibility and thereby to serve as input for L2 learning” (p. 60).

Cooperative learning has proved to be a suitable teaching approach for all levels. The developing nature of students make cooperative learning a valuable teaching strategy which suits their needs. Students need to socialize, form part of a group, share feelings, receive emotional support, and learn to see things from other perspectives. Cooperative

learning groups do not separate students on the basis of class, race, or gender and the goals of middle schools are consistent with the goals of cooperative learning theories. It promotes academic achievement and builds positive social relationships (Sapon-Shevin, 1994, p. 183).

3.5. Collaborative learning and social constructivism

Collaborative learning occurs when two or more people attempt to learn something together (Dillenbourg, 1999). It commonly refers to social constructivism, but an increasing number of people in academia have begun to use this term to imply a constructivist epistemology (Oxford, 1997). It encompasses a set of methodologies and environments in which learners share a common task where each individual depends on and is accountable to each other. Collaborative learning is heavily rooted in Dewey's views, which imply that learners do not learn in isolation, but by being part of the surrounding community and the world as a whole, and Vygotsky's views, which imply that an inherent social nature of learning exists, shown through his theory of the proximal development zone.

John Dewey, an American philosopher, described a triangular connection for the social construction of ideas between the individual, the community and the world. He proposed that ideas can only become meaningful if they meet the following requirements: (a) the ideas form part of an acceptable theory, (b) are instrumentally useful for creating positive action, (c) are constructed by participants in society and (d) can be related to reference points provided in society.

In Dewey's view, the reflective inquiry of a community of learners helps create meaning between apparently unstable events (Oxford, 1997).

Lev Vygotsky, a Russian psychologist, proposed that mind is constructed through interaction with more knowledgeable others. The individual's cognitive system is a result of communication in social groups and cannot be separated from social life (Vygotsky, 1960/1978). For pedagogs following Vygotskian ideas, the teacher acts as a facilitator and provider of assistance. Teachers perform a great service to students by providing any and all forms of assistance that might help students develop their language and socio-cultural skills.

Vygotsky suggests that there are two parts of a learner's developmental level: the 'actual developmental level' and the 'potential developmental level'. Vygotsky situated learning in the 'zone of proximal development' (ZPD), which he posited as being "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in

collaboration with more capable peers” (p. 86). Therefore, the zone of proximal development is the gap between actual and potential development, the area between what the learner can do and what can be achieved with the help of a more knowledgeable other.

In a community of L2 learners, cultural and linguistic ideas are best shaped through reflective inquiry with other people (teachers, peers, native speakers, etc.), who help the learner negotiate his or her own ZPD. Thus, social constructivism is the foundation for collaborative learning in the L2 classroom. Compared with cooperative L2 learning, collaborative L2 learning is more explicitly oriented to negotiating and fulfilling the potential (traversing the ZPD) of each L2 learner (Oxford, 1997).

Nyikos & Hashimoto (1997) point out that within a group, each person has an individual zone of potential. However, in a dynamic interrelationship of ideas and views, this potential may grow or be stymied, depending on various group conditions that may or may not be conducive to learning and social growth.

In the L2 classroom, this is interpreted as the teacher providing hints or clues, praising, reminding or reviewing anything that L2 students need at a certain stage of an activity. When the learners need assistance, the teacher provides scaffolding to ensure that the learner's constructs grow more complex. The term 'scaffolding' is first described in Wood et al. (1976) as a metaphor to describe the type of assistance offered by a teacher or peer to support the student's learning. In this process, the teacher helps students master concepts which initially are beyond their grasp. The students complete unassisted as much of the task as possible and the teacher only attempts to help students with tasks that are beyond their current capacity. Student errors are expected but, with the teacher's feedback and prompting, students are eventually able to achieve the task or goal. When students become able to complete the task, the teacher begins the process of 'fading', gradually removing the scaffolding, allowing students to work independently. "Scaffolding is actually a bridge used to build upon what students already know to arrive at something they do not know. If scaffolding is properly administered, it will act as an enabler, not as a disabler" (Benson, 1997, p.126). Wood et al. (1976) point out six types of scaffolding functions: recruiting the learner's interest, simplifying the task, highlighting its relevant features, maintaining motivation, controlling the learner's frustration, and providing a model.

Other social constructivist concepts include 'context' and 'situated cognition'. The context in which knowledge is developed cannot be separated from learning, nor is it neutral (Lave & Wenger, 1991, cited by Oxford, 1997). Learning is always situated within a certain context. Learning takes place while people participate in the socio-cultural activities of their own learning community, thus constructing their understanding and responsibilities. Social constructivists are especially focused on the learning process, rather than in the

achievement of projects. Activity-based situations with meaningful purposes are key to develop the construction of knowledge. Rather than just the teacher-learner connection, there exists a field of many other connections that can become means to attain knowledge.

4. Methodology

The data analyzed from both the audio and video recordings in this research project features a classroom-based approach and is focused on the trainee-teacher professional development. The trainee-teacher has chosen an analytical and distanced approach in order to observe her performance and detect which aspects have worked and which can be improved in the future.

In the self-observation study 1, the analysis is based on the mechanisms that the teacher is using in order to introduce the content and what the students' reaction is. Self-observation 2 study examines the data systematically to reveal the strategies used by students to master their content part, exchange information and learn from their partners in a cooperative learning activity framework. The methodology used in both analyses follows a qualitative strategy.

To describe what a qualitative approach represents to the treatment of data, Denzin and Lincoln (1998) propose the following metaphor: Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretative, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations including field notes, interviews, conversations, photographs, recordings and memos to the self (...). The researcher is a bricoleur, quilt maker or filmmaker. A person who assembles images into montages (Denzin and Lincoln, 1998: 4-5).

Moreover, Punch (2009) points out that this kind of research is a human construction, framed and presented within a particular set of discourses, and conducted in a social context.

Specifically the research method used is the ethnography. According to Punch (2009), "The point of ethnography is to study and understand the cultural and symbolic aspects of behaviour and the context of that behaviour, whatever the specific focus of the research" (p.127).

Some of the main characteristics of the ethnographic approach can be observed in these analyses. First of all, when studying a group of people, this research method starts from the assumption that the shared cultural meanings of the group are crucial to understanding its behaviour. Furthermore, it is sensitive to the meanings that behaviour, actions, events and contexts have in the eyes of the people involved. Another important feature is that the group will be studied in its natural setting, the classroom in this case.

Punch states that data collection may be supplemented by something which gives a fuller picture of the data, such as film or audio records, documents, diaries, etc. Besides, the ethnographic record needs to be comprehensive and detailed, and typically focuses patterns.

Regarding the research studies, there are two foci of observation. First of all, the video recording that observes the trainee-teacher strategies and the students' reactions to them in the development of the lesson. The video excerpts were transcribed in order to analyze the types of questions formulated by the trainee-teacher, the students' responses, the body language, etc.

The second focus of observation is the audio data gathered which belongs to the student's conversations while working cooperatively in small groups to solve a jigsaw task. This analysis observes how students' interact and which patterns of cooperative learning do they follow.

The trainee-teacher has used a strong theoretical framework to analyze the findings through conversation analysis. Moreover, these findings have been thoroughly revised by both trainee-teachers in order to ensure the quality of the analysis.

5. Empirical studies analysis

5.1. First empirical study

5.1.1. Introduction

This first empirical study focuses on the several strategies the teacher⁸ uses to construct and achieve the knowledge incorporating the students' dynamic participation in the development of the class. It is not only focused on what the teacher says, the language

⁸ I am the teacher, the one who is writing this analysis and carrying out this research.

itself, but also the paralinguistic and mostly the non linguistic⁹ resources she uses and how students react to these inputs.

Personally, she is, as a trainee-teacher, quite interested in all the resources available to transmit and construct the knowledge in the classroom. She is also especially aware of the importance of catching and maintaining the attention of the students so they feel they are an active part of the lesson.

Taking into account her experience until now, she has seen for herself that student's appreciate to a large extent the fact of being engaged in what is going on during the lesson. From the teacher's point of view, the more the students consider they are involved, the more they participate enthusiastically and want to continue learning.

Therefore, she has considered important to make an approach to the resources the teacher has available and that helps her to achieve her goals in class. The teacher thinks that it is important to take into account that 97% of the whole communication of the human beings is non-verbal. So, from her point of view, it is a valuable resource to develop in order to apply it in classroom.

More specifically, this research is based on the analysis of the data obtained from a video recorded during one of the lessons and the transcript of the recorded fragment during the teacher's first practicum, which took place on January 2010 and that lasted two weeks.

5.1.2. Research Context

5.1.2.1. Activity implemented

The excerpt video of the teacher's first empirical study was recorded in January 2010, during her first practicum. During this period, as the practicum lasted only two weeks, she did not implement a complete teaching unit, but she prepared some complementary activities to the Migration Project her mentor has organized and was implementing those days.

Specifically, the activity that is shown in the video is in fact the explanation of a Power Point Presentation that her mentor has prepared for that classroom. The teacher and the peer student-teacher are doing tandem teaching and they are basically explaining the concepts of immigration and emigration trying to elicit the main points from the students¹⁰.

⁹ Also regarding the gesture-body language as an outstanding aspect.

¹⁰ It has to be taken into account that they had already been working a little bit with these ideas.

5.1.2.2. Data and data gathering conditions

The data corpus was gathered from the excerpt video recorded on the 12th January, which comprises 2 minutes and 55 seconds. There were three teachers in the classroom to implement the activity: the two student-teachers, which managed the classroom, and their mentor. The camera was fixed using a tripod in the back of the classroom.

The methodological tool chosen is content analysis, using occasionally tools from conversation analysis. With this tool, data can be examined carefully, revealing the strategies the teacher uses in order to introduce content and what the students' reaction is to these stimuli.

In order to preserve the students' privacy, all names appearing in this study have been substituted by pseudonyms.

Conversation analysis transcriptions appearing in this study follow the symbol conventions referenced in Richards and Seedhouse (2007).

5.1.3. Objectives and research questions

As it has been already pointed out in the introduction to this study, the main objective of this study is to draw attention to the strategies the teacher uses to establish the target concepts dealt in class and which help her to involve the students into the conversation and the development of the lesson.

Furthermore, the teacher is personally interested in somehow demonstrating the importance of all the extra resources besides the language itself that lead to the construction of the knowledge, taking into account the students, and understanding the development of the class as a cooperative task.

Teachers' talk serves as a valuable source of input to language learners, but it is not the only one. It is important to remark that communication takes place in all the forms of sensory channels. In an interaction channel, like inside the classroom, it is impossible to not communicate.

In addition, the teacher communicates with her face expression as well as with her body language, eye contact and non-linguistic discourse characteristics.

So, the research questions on which the teacher will focus her attention on would be the following:

- How is communication and participation achieved among the two co-teachers and the students?
- Which resources does the teacher use?
- How do the elements of the non-verbal behaviour help the teacher to achieve her goals in class?

5.1.4. Analysis

In the first place, the teacher will introduce the analysis offering a contextualization of the video recorded. Then, she will analyze the 6 fragments in which the transcript of the video has been divided.

The video lasts 2'55" and it was recorded on the 12th January during her first practicum period. The teacher, along with the other peer-student teacher, is dealing with several concepts related with the Migration Project that the students are working on. The teacher is using a Power Point presentation and is supporting her explanation with it. She and her peer are eliciting answers from students. Besides the teacher, in this excerpt several students appear: the peer student-teacher and their mentor.

In the following excerpts evidences on how communication and participation is achieved among the two co-teachers and the students can be found. The several strategies that the teacher uses not only cover her speech, but also elements of the non-verbal communication.

5.1.4.1. General facts

- Teacher's input talk: The two co-teachers are explaining the content using a Power Point Presentation and are involving and engaging the students in the development of the lesson using several questions.
- Students' interaction: Students participate without following a particular turn order. The teacher does not establish participation turns. Students participate randomly. Analyzing the video, the teacher has noticed that, usually, the answers are given from the same female

and male students. On the other hand, the turn-by-turn analysis usually follows the IRF (initiation-response-initiation / follow-up) structure. In general, the turn taking is asymmetrical. Teachers are the ones who allocate the turns or at least, who are leading the weight of the conversation.

- Body language and gestures: The teacher uses several gestures to support her voice as an additional strategy to retain the students' attention.
- Visual support: The teacher uses mainly a Power Point presentation (during the activity the teachers also use the blackboard).
- Time to wait for students' answers: Teacher uses silences in some occasions to let students think about the answer.

In order to analyze the excerpt in depth, the teacher has divided the transcription in 6 fragments, paying special attention to her interventions. All the speakers have nicknames.

NAME	ROLE	GENDER
AP	mentor	purple
JA	teacher	yellow
HM	peer student-teacher	blue-green
SF	female student	gray
SM	male student	pink
SS	several students	green

5.1.4.2. Transcript analysis by fragments

Fragment 1

001	AP:	ok	
002	HM:	∞ (xxx) this one or ∞	
003	JA:	well, uhhh here you can see that there is a map, and	((pointing at the ppt)) ((moving hands))
004		you can see different arrows. do you see it? the colors	
005		are a bit, you now (xxx) uhhh	
006	HM:	(xxx) we can see	

In turns 003, 004 and 005 the teacher is introducing the PPT, showing a slide which features a map. This kind of visual support helps the teacher to attract the students' attention and to prepare them for the message to come (Stubbs, 1983).

By using a closed question: "Do you see it?", the teacher checks if everybody is able to see what she is showing. Moreover, she forces, in some way, the students to pay attention to

her explanation. These kind of questions help her to check pupils' attention and whether they are following or not.

In this case, the co-teacher is the one who answers the question, anticipating the students own answer. This shows a constant in this excerpt: the difficulties of avoiding overlaps among teachers and students in a tandem-taught lesson.

Considering the visual information, the teacher points at the PPT to show the arrows to students. She also uses her hands to explain that the colours of the arrows are a bit mixed (at this point, she doesn't know how to say that the colours are mixed and using her gestures helps her to be understood).

Fragment 2

007	JA:	yeahh, you can see. so uhhh the arrows, and you can	
008		see that uhhh (.) the larger the arrow is (.) is the more	
009		people that migrate. so, uhhh you can see that=	
010	SF:		((coughing))
011	JA:	=perhaps (.) what do you see here in America? people	
012		arrive to America or [they]?	

In this fragment 2, once again, the teacher is using a question to engage students in her explanation. The teacher is using a display question. She already knows the answer, but she wants to check students' knowledge. Moreover, she aims at encouraging them to participate, thus making her explanation more interactive.

She is asking for the learner's cooperation. As Allwright and Bayley (1991) pointed out, the students make a significant contribution to the management of the interaction that occurs in the classroom.

Fragment 3

013	HM:	[ok, do they]?
014	JA:	[they leave]
015	SF:	arrive
016	JA:	they arrive

In turn 013 and 014 another overlap between the two co-teachers can be found. Later, one female student answers the question. The teacher thinks that this student is someone who is sitting at the front of the class. This student usually participates in an active way. In fact, she is one of the most proficient students of the group. So, in this case, it is shown what Slimani (1987, cited by Allwright and Bailey, 1991) observed: most proficient learners interact more frequently than their less proficient classmates.

In turn 016, the teacher is using one of the categories related to classroom participation by (Chesterfields, 1985, cited by Allwright and Bailey, 1991) repeating the student's answer to reaffirm their response. Therefore, she tries to clarify the correct answer to the rest of the group.

Fragment 4

017 018	HM:	ok so, we have (.) ok people emigrate or immigrate to America?	((moving)) ((pointing at the ppt))
019	SF:	immigrate	
020	SM:	immigrate	
021	HM:	ok (0.1)	((shaking his head))
022	SS:	no	
023	JA:		((laughing and moving hands indicating "no"))
024	SS:	emigrate	
025	AP:	[emigrate]	
026	JA:	[EMIGRATE TO America]	((moving hands))
027 028	HM:	[EMIGRATE TO] America, ok, from (0.3) we have Europe, Asia, Africa? (0.4)	((moving hands))
029	SF:	(xxx)	
030 031	HM:	ok (.) well, there seems to be quite an income from Asia, no? this is a very large arrow	((pointing at the ppt))
032	JA:		((pointing at the ppt)) ((nodding))
033 034 035	HM:	ok, there seems to be quite a few from Europe as well, no? according to quite a thick arrow ok? Do people, (0.2) eehmm emigrate to Africa?	((moving hands)) ((pointing at the ppt)) ((scratching hair))
036	SS:	No	
037 038	HM:	no they <u>don't</u> . uhhh, yeahh well, :this seems (.) like we are talking about the case o:f, of slavery no?	((pointing at the ppt)) ((laughing))
039	JA:		((nodding))
040 041 042	HM:	and human trade and this kind of stuff, but (.) mmm for example, do peopl:e immigrate (.) do people emigrate to?=(0.2)	(laughing)) ((moving)) ((pointing at the ppt))
043	SF:	south	
044	HM:	=to South America?	
045	SF:	no	
046	SS:	no	
047	HM:	yes, they do? or no, they don't?	
048	SS:	no, they don't	
049	HM:	no they don't at all. ok. good. ok, let's move on	

A side-sequence takes turns from 019 to 023, due to students' first answer being wrong and, as a result, the teacher has to guide them to the right answer. According to Stubbs (1983), teachers may actually correct or alter something a student has written, either explicitly or by repeating the 'correct' version. At this point, the teacher is again using her body language to give clues to the students.

So, from turn 024 to 028, the two student-teachers and the tutor are answering unison. They are all proving the answer aloud to the students.

Then, in turn 032 and 039 the teacher is not talking, but supporting her peer's explanation by pointing at the Power Point and nodding.

As already pointed out, in this fragment it is quite clear that, generally, answers are given from the same female and male students. To avoid this situation, it should have been advisable to call on learners who would not participate spontaneously.

Fragment 5

050	JA:	ok, here you have uhhh people on the move uhhh	((pointing at the ppt))
051		related to the States, Mexico, Europe and Asia. It's like	
052		a summarize of what we are saying. so, United States,	
053		uhhh, you can see here that more people move to the	
054		United States than any other country but - uhhh 31 one	
055		million people in the US were born uhhh, (xxx) not in	
056		the US but in other [countries]	
057	SF:	[countries]	

From turn 050, the teacher is introducing another slide that is offered to the students as a summary. As Stubbs (1983) suggested, teachers often summarize something that has been said or read.

When analyzing this fragment and the video, the teacher realizes that she is giving an explanation in a teacher-fronted activity and, although she is trying to monitor comprehension, she is not offering students enough opportunities to participate.

In fact, and maybe because of the teacher's speech being quite slow, only at the end of the teacher's explanation the female student that usually participates dares to overlap the last word of the teacher's speech. They both say "countries" at the same time. They are responding at unison by proving the answer out-loud together.

Nevertheless, it is also remarkable that, in this fragment, the teacher continues using her gestures to accompany her explanation.

Fragment 6

058	JA:	yes. and Mexico uhhh, Europe as well, similar to the	((moving hands))
059		United States and Asia. do you think people in Asia	
060		uhhh are emigrants or immigrants? they receive or (.)	
061		they (.)?	
062	SF:	they move (xxx)	
063	SM:		((coughing))
064	JA:	°ok, very good. do you want to add something about	((looking at M))
065		this slide? no?°	
066	HM:	ok, so, people emigrate from Asia and they immigrate	((pointing at the blackboard))
067		to (.)	
068	JA:	Europe or [the States]	
069	HM:	[Europe] or the United States mostly, ok. so,	((pointing at the
070		people in Asia mostly, we are talking about, well, it	blackboard))((looking at the ppt))
071		doesn't say [any]	
072	JA:	[no, no]	((looking at the ppt)) ((nodding))
073	HM:	=any cipher	
074	HM:	but, they emigrate from Asia to and they immigrate to	((touching the blackboard))
075		the United States, ok. so, we have these concepts.	
076		good. ok.	

From turn 058 to turn 061, first off, the teacher says “yes” in order to give feedback to the student’s previous turn. At the end of this turn, the teacher leaves the sentences incomplete and remains silent on purpose, to give students the opportunity of taking part in the conversation. In Allwright and Bailey’s (1991) opinion, it is sometimes desirable for teachers to systematically speak less and wait longer after raising a question. On the other hand, Stubbs (1983) also recommended teachers to control the amount of speech.

Next, in turns 064 and 065, the teacher begins praising with “ok, very good”. She is giving a positive evaluation to the student’s answer. Then, she is asking a question but, in this case, to her peer student-teacher. The amount of overlapping among teachers is again noticeable. This, as already mentioned, demonstrates that coordinating a “perfect” tandem-teaching is not easy (turns 068 and 072).

To sum up, the analysis of the transcripts shows some strategies that the teacher uses, more or less fortunate, to engage students, to achieve an interactive explanation. For example, she repeats several times the students’ answers, paying close attention to particular words, and she also tries to check the students’ comprehension by consolidating and clarifying concepts.

In order to promote a better interaction, the teacher has seen that it is crucial to formulate good questions to students, not only closed questions as “Do you see it?” (004), “what do you see here in America?” (011) or “Do you think people in Asia are emigrants or immigrants?” (059), as she has confirmed when analyzing the video and the transcript.

Regarding the silences, the teacher has used this strategy in her interventions. For instance: “so, you can see that” (008) or “they receive or they...?” (060). From the teacher’s point of view, it is an important technique that sometimes is not used or well exploited in class. It is essential to make pauses which allow students enough time to process the information they have just received. The teacher considers that students will appreciate these opportunities.

Finally, she has tried to motivate, stimulate and engage students using not only her speech, but also other strategies. As mentioned above, she uses the visual resource of the PPT and her gestures, she makes eye contact with students and uses her body language to complete and accompany her explanation.

5.1.5. Conclusions

The aim of this empirical study was to analyze the several strategies the teacher uses to construct and acquire knowledge incorporating the students’ active participation in the development of the class. So, the central objectives were to evaluate how communication and interaction is achieved among the different actors, teacher and students, examining the resources the teacher uses. At the same time, this study has been investigating the importance of the non-verbal language. Regarding not only how it helps the teacher to accompany her voice, but also the way students react to these other inputs.

To begin with, the teacher has made an approach to what communication and interaction is. She considers that teachers are not simply book describers. So, from this comparison, she wants to show that in the goal of teaching and mainly “educating” or “contributing” to the development of teenagers, it is important to be a good communicator and to be competent enough to use all the resources available. Sometimes, it has been said that teaching is similar to acting. In fact, when teaching, we are in front of an audience that will evaluate our performance.

Regarding the construction of knowledge in a language classroom as an interactive process, it has been shown in this study that the teacher tries to promote involvement in class using several questions or other resources trying to make students participate. Maybe, it would have been better in some occasions to nominate the students in order to “force” them answer the questions individually and following an order, not randomly. This way would have helped to achieve a better fluency in the interaction and in the development of the learning. Furthermore, they would have been more engaged in the explanation.

As already mentioned, the teacher has seen first-hand that students are obviously more engaged in the class when they are involved in what is going on. This happened especially when the teacher prepared interesting activities for them and they felt part of the “show”, meaning they realized that the learning cannot continue without them.

Still considering the classroom interaction and when analyzing the video and the transcript, the teacher has noticed and is pretty sure that the two individual voices, the male and the female ones, are always the same students. Moreover, these students, especially considering the female voice, are the most proficient in English. So, the teacher has realized that some students were not verbally participating. Even so, she agrees with some author's theories that these silent students perhaps are not verbally participating but they are learning from the others. Nevertheless, during the classes in which the teacher took part, in general students did not show any feelings of embarrassment with the teacher's presence or with the activities she was developing. On the contrary, they were always quite ready to participate. It was perhaps the teacher that from time to time experienced insecurities.

Revising her first practicum diary, she literary wrote at that moment: *“later, we met our mentor and she commented with us what she has seen since today. She told me that I have to be more confident with my body language and with my discourse. From my point of view, as I told her, I am completely aware that I have a problem of lack of confidence with my English. I mean that this is not the first time that I teach, but it's the first time that I teach in English. And although I think I have improved a lot and I am more fluent in my speaking today than some weeks ago (as I am practicing conversation with an English teacher) I sometimes feel nervous because I tend to think that every time I open my mouth to say something, I will make a mistake. April encouraged me to forget about the mistakes and “take it easy”. I am aware that maybe students don't notice my possible mistakes but I consider myself a perfectionist and I want to overcome this situation as soon as possible”.*

Another significant part of this paper has been the study of the non-verbal language related with the resources the teacher has available. The non-verbal language is seen as a fundamental element in achieving a proficient communication and interaction inside the classroom.

The teacher has noticed, as she previously supposed, that this kind of language has not been studied much regarding its relationship with school and teachers. Perhaps, the teacher has not been able to find the sufficient or the most relevant references.

Going back to the recordings, the teacher has noticed that although she is quite expressive, she is standing in the front of the class next to the PPT as if the screen was a life jacket or

something similar. Therefore, she is conscious of this fact and the importance it has when showing security in front of the students.

Also referring to the non-verbal language, in the vignette that has been analyzed, it is difficult to distinguish the body-language of the students but this is also extremely crucial to guess if the students are getting bored, are paying attention or are going to talk with the peer sitting next to them. The teacher is as well interested in non-verbal language “signals” in the students and the strategies the teacher can develop to “catch” as much of what is going on as possible in the development of the class. Maybe, this would be a good starting point for the next teacher’s paper investigation.

5.2. Second empirical study

5.2.1. Introduction

One of the primary functions of a teacher is to create opportunities so the students will develop their skills they will need to become competent citizens in the future. Consequently, teachers must take into account the aspects which shape society and the current world. The role school plays in preparing students is significantly different nowadays from the traditional role of schools used to play in the past.

Cooperative learning has always had a place in the classroom. However, in recent years, schools have shown their concern about the need of adapting themselves to the advances of society, which demands citizens to be capable of working cooperatively, of interacting with others and communicating effectively, making imperative to expand the methodology from individualistic and competitive approaches to a wider focus which encloses cooperative learning.

This research is based on the analysis of the data obtained from the audio recording files recorded during two sessions and the detailed transcripts of a set of excerpts from these recordings.

This study’s focus is set on how students process the content in an information swap task in an EFL classroom through cooperative work. This study draws on the research conducted by several members of the Universitat Autònoma de Barcelona CLIL-SI group. Studies like Escobar and Nussbaum (2008), Evnitskaya and Aceros (2008) and Horrillo (2009) analyze the complexities of the jigsaw task, ranging from its design to the qualitative and quantitative approach taken to analyze said task. This research has been carried out by

examining the students' oral productions through content analysis, occasionally using conversation analysis tools as a mean of support.

Escobar and Nussbaum (2008) explore the learning processes in information-swap activities during CLIL by analysing the recordings of several student dyads during the task, researching on the strategies used by students which are common in all groups, such as the students' hierarchical vision of the teacher's instructions and their strategies to construct the conversation together. Evnistkaya & Aceros (2008) study the effect of cooperative work regarding students' characterization and its role in student's foreign language learning. Horrillo (2009) approaches the data quantitatively, researching the amount of time that students spend on-task and off-task during cooperative activities.

To begin with, the research context of this present study is briefly explained (section 1) to contextualize the information. A description of the activity implemented and the data gathering conditions can be found. The jigsaw model is the cooperative learning technique examined in this study. A set of modifications to this traditional model have been applied in the implementation of this activity.

Then, the objectives and the research questions considered in this study are exposed and dealt with (section 2). Afterwards, in section 3, eleven excerpts from the transcript analysis are examined under the light of cooperative and collaborative learning.

The following section, the general patterns found in the data analysed are discussed, together with the expectations on the students chosen from the context section (section 4). Section 5 of the analysis refers to the conclusion, where the findings are summed up and the doubts generated open new guidelines to further research and practice.

5.2.2. Research context

5.2.2.1. The Unit

The activity implemented forms part of a content-based unit which was implemented during the second Practicum of the Universitat Autònoma de Barcelona TED Master's Degree by the two trainee-teachers and their mentor. This content-based unit represents a joint project with the English and Science branch of the TED Master in Institut Garona and is focused on the presence of chemistry in everyday life.

Consequently, not only the language, but also the content –Chemistry- poses an extra difficulty to students, who need to work out a content which may appear to students as

encrypted in L2 in order to effectively solve the tasks, all this in the EFL lessons. This option was chosen for pedagogical and also for circumstantial reasons, taking into account the CLIL program that the secondary school was implementing.

5.2.2.2. Activity implemented

The audio recordings were recorded on April 2010, specifically on the 15th and 19th, in a 4th ESO classroom during trainee-teachers' second practicum period. It is an information swapping activity based in the principles of cooperative learning. This activity corresponded to a jigsaw activity which represented one of the main activities in the trainee-teachers' unit. Jigsaw teaching was invented and named by Elliot Aronson et al. (1978).

This activity was originally designed as an answer from education to the social disarray that the racial mix had produced in Austin, Texas. This technique fostered collaborative work and learning among students from different communities and proved to be a valuable contribution to socialization among students from different belonging to different ethnic groups (Aronson et al., 1978).

The content of the unit was divided in four sub-topics (the presence of chemistry in food, the presence of chemistry in medicine, the presence of chemistry in housekeeping products and the presence of chemistry in personal care products) and four expert sheets were designed, covering the four sub-topics. Only three of these expert sheets were implemented on that group for classroom management reasons, leaving out the presence of chemistry in housekeeping products.

5.2.2.2.1. The traditional jigsaw model

The jigsaw model is a cooperative learning technique. This procedure encourages listening, involvement, interaction, peer-teaching, and cooperation by giving each member of the group an indispensable part of the activity. Both individual and group accountability are built into the process (Aronson, 2008). In ESL classrooms, jigsaws are a four-skills approach, integrating reading, speaking, listening and writing.

Aronson (2008) describes the procedure in ten steps:

1. Divide students into 5- or 6-person jigsaw groups. The groups should be diverse in terms of gender, ethnicity, race, and ability.

2. Appoint one student from each group as the leader. Initially, this person should be the most mature student in the group.
3. Divide the day's lesson into 5-6 segments. For example, if you want history students to learn about Eleanor Roosevelt, you might divide a short biography of her into stand-alone segments on: (1) Her childhood, (2) Her family life with Franklin and their children, (3) Her life after Franklin contracted polio, (4) Her work in the White House as First Lady, and (5) Her life and work after Franklin's death.
4. Assign each student to learn one segment, making sure students have direct access only to their own segment.
5. Give students time to read over their segment at least twice and become familiar with it. There is no need for them to memorize it.
6. Form temporary "expert groups" by having one student from each jigsaw group join other students assigned to the same segment. Give students in these expert groups time to discuss the main points of their segment and to rehearse the presentations they will make to their jigsaw group.
7. Bring the students back into their jigsaw groups.
8. Ask each student to present her or his segment to the group. Encourage others in the group to ask questions for clarification.
9. Float from group to group, observing the process. If any group is having trouble (e.g., a member is dominating or disruptive), make an appropriate intervention. Eventually, it's best for the group leader to handle this task. Leaders can be trained by whispering an instruction on how to intervene, until the leader gets the hang of it.
10. At the end of the session, give a quiz on the material so that students quickly come to realize that these sessions are not just fun and games but really count.

5.2.2.2.2. Modifications to the traditional model applied in the activity

The implementation of the activity followed the traditional model to a certain extent. The orthodox method to implement the task was not designed to take into account foreign language speakers. Therefore, an adaptation of the orthodox method has been chosen in order to exploit cooperative learning in the ESL classroom. Said adaptation draws on the "ArtICLE" project from the Universitat Autònoma de Barcelona CLIL-SI group. A resume of the divergences from the orthodox method can be found below:

1. The groups were heterogeneous and formed by three to four students.
2. There was no leader figure.
3. The students dealt with three topics.
4. It was allowed to write down up to five words as reminders of their topic.
5. Students were allowed to take notes of their peer's explanation but not of their own topic.

The ArtICLE project was used as a basis, considering their proposal for instructions delivery, measures to adapt and structure the language, the presentation of the information in the experts' sheets, the modulation of the communicative and cognitive challenges, support for students, creation of the final quiz, etc.

5.2.2.3. Data and data gathering conditions

The data corpus was gathered from the oral conversations produced in the jigsaw activity during two EFL sessions. These conversations were recorded with tape recorders. To implement the activity a group of two teachers, two trainee-teachers and one researcher decided to split the group in two halves. One of the halves was formed by a group of 10 students, who worked in 3 teams which ranged from 3 to 4 members. The recordings comprise the two sessions where the activity took place. Students were asked to not stop the recorder during the whole sessions unless the teacher asked to.

The methodological tool chosen is conversation analysis. With this tool, the data can be examined thoroughly to reveal the mechanisms used by students to master their topic, exchange information and learn from their partners. This aims at identifying the possible regularities and patterns that students use to complete each stage.

In order to preserve the students' privacy, all names appearing in this study have been substituted by pseudonyms.

Conversation analysis transcriptions appearing in this study follow the symbol conventions referenced in Richards and Seedhouse (2007).

After listening to the whole data corpus, data for analysis was selected according to the quality of the informants. The informants selected work collaboratively in the task in order to attain the goals. Once the relevant data was selected, the focus was set on the response of

two specific students who had different learning profiles and responded to different expectations. The table below shows the characterisation of the informants selected and the researchers' expectations on their behaviour when confronted with the activity.

Main informants	Characterisation of the informant	Researchers' expectations on the informant
Pau	He is retaking 4th of ESO. Failed English the course before. Low English level in reference to the rest of the group.	He will probably be off-task most of the time. He will probably not talk in English at all. He will probably give up.
Mar	Her ESL marks are remarkably high in reference to the average of the group.	She is likely to talk in English most of the time. She will probably be capable of succeeding in the activity.

TABLE 1. Informants primarily tracked during the task.

In this task there are other informants as well, whose contributions are not primarily tracked but provide relevant information in the context of excerpts chosen. The following two tables show the characterisation of the rest of the expert and home group members.

Subsidiary informants	Characterisation of the informant	Researchers' expectations on the informant
Carles (expert and home group)	Retaking 4 th of ESO. It appears he will most likely pass the course according to his marks. Low English level in reference to the rest of the group.	As he and Pau are both in the same expert and base groups, and also in good terms with each other, he will try to help Pau. He is not expected to use much English. He will probably give up.
Oscar (expert group)	Retaking 4 th of ESO. He will not pass the course if he continues with his low marks.	He might not talk in English at all. He will not try. He will remain silent and off-task most

	Prone to get distracted	of the time.
Eva (home group)	High English competence level according to her marks. Very social but prone to behave disruptively.	She is considered to be capable of succeeding in the activity but she might not as she will be off-task most of the time. She will talk in English often.
Laia (home group)	Average English level in reference to the rest of the group. Very respectful to teachers and classmates.	She is expected to try hard to succeed in the activity. She will struggle to talk in English. She will help her team mates.

TABLE 2. Other informants.

5.2.3. Objectives and Research Questions

Cooperative learning has been traditionally used in the classroom to learn content. However, L2 teacher's approach opens a new perspective, using this approach to attain language goals through content. This approach can be confusing for students, who in the traditional teacher-led lessons have the continuous input of the teacher. This study focuses on the use of cooperative learning in a EFL classroom and its impact on students, observing how they negotiate and cope with the new information through team work.

To achieve these goals, this study poses the following research questions in this study are the following:

- Does this activity favour the learning of students with different characterization and learning profiles?
- How does the feeling of success influence students learning and motivation?

5.2.4. Analysis

Pau shows a low English competence level according to his marks and shows certain discouragement towards the whole educational system. He has been diagnosed Attention-deficit hyperactivity disorder (ADHD) and is re-taking 4th of ESO. Moreover, this is the

second time that he re-takes a course, thus reaching the maximum times that a student can re-take a course in the current Spanish obligatory educational system. For classroom management purposes, Pau and Carles, a student with low English competence level, share the same topic in their base group, thus forming the only base group of four members. This strategy aims at fostering their cooperative work and consequently catering for the diversity in the group.

Mar, on the other hand, shows a high English competence in comparison with the average level from her 4th of ESO group. She takes extra-curricular English lessons. This student shows a relatively high potential for learning. However, this potential is not developed as her quality contributions during the lesson are not reflected in the exams. She seems to be content with just passing the subjects.

In the following eleven excerpts evidences of the stages the students go through during the task development can be found, along with information on how they approach the content and how they negotiate the procedure and how they face the challenges.

Experts group, day 1

This first excerpt belongs to the expert group recorded on the 15th of April, and roughly starts at 02'50" and ends at 03'07", lasting for about 18 seconds.

Excerpt1

00011	Pau:	<i>jo no m'entero de res</i>
00012	Oscar:	yo no me entero de nada
00013	MARC:	okey (.) so you will have to help each other\
00014	Pau:	<i>no no (.) això és impossible</i>
00015	MARC:	if you read it aloud maybe it will help you (.) but it's up to you (.) okey/
00016	Oscar:	yo si quieres me apendo una linea
00017	Pau:	food additives are substancesss (0.5)
00018		added to food\ (.) ya está\
00019	Oscar:	yo la primera!
00020	Mar:	<i>pero tio que no t'has d'apendre(.) ho has d'entendre i ja està</i>

This excerpt belongs to the initial stage of the task, where students join in experts groups. This expert group is in charge of explaining to the rest of their home group the presence of chemistry in diet. This excerpt is extracted from the very beginning of the recording and it shows the first impression from students towards the activity. In this first excerpt there are signs of anxiety towards the resolution of the task, as can be seen in turns 11 or 14. The expert group shows traits of doubt and express verbally their feelings of being overwhelmed and frustration.

This group is remarkably heterogeneous, it being formed by a female student with a high English competence level (Mar), another male student with a low level (Carles) and two other male students with a very low level (Pau and Oscar). In this excerpt the first traits of socialization in the group can be observed, which is a relevant factor of team work. Students express their feelings looking for support and approval in the rest of their team mates. Students support each other, as can be seen in turns 11 and 12. Moreover, at this preliminary stage, students start understanding the procedure and request support from the teacher. Right afterwards, they start negotiating the task procedure, as can be seen from turns 16 to 19.

While Pau and the rest of the group show these signs of anxiety, Mar shows much more restraint and confidence and is able to reformulate the task procedure to her team mates.

This second excerpt belongs to the same stage of the previous excerpt and appears approximately 5 minutes later, roughly lasting from 08'05" to 08'25".

Excerpt2

00026	Mar:	<i>diu que:: que:: els foods additives es posen al menjar (.) per conservar el sabor(.) o l'aroma:: o que:: o sigui (.) que es vegin millor (.) saps!</i>
00027	Pau:	<i>per l'olor també(.) veritat!</i>
00028	Mar:	<i>si (.) perquè tinguin millor aparença\</i>
00029	Carles:	<i>ah va\</i>

In this excerpt students have already finished a preliminary first reading of the text and start getting familiar with the content. There is evidence that students are trying to solve the problem and, after reading the text, are constructing the content in group. To achieve this, they are reasoning the content so it becomes meaningful to them, as can be seen in turns 27 and 28. This is linked to Dewey's and Vygotsky's theories about the social nature of learning.

Interestingly, as students deem the task too complex, students decide to self-scaffold the content of the text by going through it in their L1. This way, the content becomes more transparent and this eventually leads them to understanding it in a more efficient way. Students are relating the content to their previous experience.

Mar acts as the more knowledgeable other and instructs her team mates so that they all reach the same level of competence. Therefore, Mar is interacting with the group zone of proximal development so that all the group members achieve a similar status of mastery.

This third excerpt is taken approximately one minute later from the previous one, lasting from approximately 09'15" to 09'30".

Excerpt3

00033	Mar:	<i>i llavors (.) aquí diu que (.) hi ha polèmica sobre si els aditius aquests (.) són bons o dolents perquè alguns han-</i>
00034	Pau:	<i>=perquè alguns han donat problemes\ (.) no/</i>
00035	Mar:	<i>Si (.) maleltesi i coses d'aquestes (.) com obesitat (.) i problemes de cor\ (.)</i>

It can be observed that the first preliminary anxiety stage has dispelled in favour of a much more confident stage where students feel more comfortable and start a reflective inquire stage where they try to create meaning from the text given. As can be seen in turn 34, Pau tries to recognize the new information from the content by linking it to his previous knowledge and creating an acceptable hypothesis.

This responds to an exploratory conversation, where they are trying to decode the content through their L1. This conversation shows higher quality from fragment 1. Pau is paying close attention to Mar's discourse. His disposition is not passive, as he is processing the text. This justifies the overlapping from turn 34. Mar ends turn 35 inviting Pau to contribute. He accepts the invitation and adds new information that is not present in the original content. He is adding essential information. In turn 34, he asks Mar for confirmation (no?) and in turn 35 she confirms it (si).

The fourth excerpt is extracted during the same stage, approximately four minutes later from the previous one, this exchange taking place from 12'55" to 13'15".

Excerpt4

00044	Carles:	<i>=a::nd to regulate each additive is assigned an e number</i>
00045	Mar:	<i>no\ vamos por aquí\</i>
00046	Carles:	<i>pero si això ja ho has dit</i>
00047	Carles:	<i>this is used only in Europe\</i>

In this excerpt an effort by the students to explore the content in the target L2 can be seen. This covers the first approach to the content using the target L2. However, when it comes to negotiating the task, students switch back to their L1. This implies that students are trying to solve the task with the help of the rest of the group members and that there is a simultaneous interaction where all the members are contributing to the common goal. There is evidence that students with different levels participate similarly, disregard of their competence.

As can be seen in turn 45, Mar manages the task so that all her team mates reach the same goal and openly expresses her guidelines in order to solve the task as efficiently as possible. This negotiation is accepted by the rest of the team members, who acknowledge her as the most competent member of the group.

This fifth excerpt is taken from the same stage of the activity, approximately 4 minutes later and is representative of the last part of this first stage. This excerpt lasts approximately from 17'37" to 17'57".

Excerpt5

00052	Pau:	food additivesss <i>què vol dir</i>
00053	Mar:	<i>eh/</i>
00054	Pau:	food additives
00055	Mar:	<i>són substàncies\</i>
00056	Pau:	a:: substances
00057	Mar:	food additives
00058	Pau:	[<i>són substàncies</i>]
00059	Mar:	<i>com colorants\</i>
00060	Pau:	a::: <i>d'acord\ d'acord\</i>

During this excerpt, the time to master the content in the experts' group is finishing and students are consolidating the content they later will have to explain to their base group. At this point, Pau, being aware that he will have to explain this data to his team members, realizes that one of the key concepts he will have to transmit remains unclear to him. He resorts to Mar to clarify his questions.

This fragment reflects how knowledge is constructed collectively at first and later processed individually. Pau shows a moment of reflective inquiry when in turn 52 he asks Mar. This leads Pau and Mar through a series of exchanges until turn 60 where Pau expresses that the concept asked has been clarified. The key seems to be at turn 59, where, in order to explain the concept, Mar uses an example so Pau can relate the concept to his knowledge. Students resolve local problems, which are focused on specific information. Students realise of the importance of comprehending the content when they have the need to produce.

Home group, day 1

The sixth excerpt consists in an exchange that takes place during the second stage of the activity approximately from 21'25 to 21'35".

Excerpt8

00119	Laia:	=it's the number that they assign to the products\
00120	Pau:	=it's a number they assign to the products to recognize them\
00121	Carles:	=to recognize them\ (.) to recognize them\
00122	Carles:	=it's the number that they assign to the products\

This extract represents a good example of how cooperative learning fosters a joint construction of knowledge, interacting simultaneously. From turns 119 to 121, students contribute to form an increasingly complex utterance. This is directly linked to the collaborative dimension of learning and how it is constructed in society. It is relevant how each member wants to contribute, aiming at the equal participation of all the group members, and make his contribution be accepted by the rest of the members of his group.

The ninth excerpt is taken from the last part of the second stage and lasts approximately from 35'00" to 35'26".

Excerpt9

00125	Pau:	<i>un moment\ (.) un moment\ (.) que això és el que ser fe\ (.)deixaré el llistó al\ (0.5)</i>
00126	Pau:	the letter e me:ans the: the: Europe\ saps/
00127	Eva:	yes/
00128	Pau:	yes\
00129	Eva:	and the number/
00130	Pau:	the number just the products\
00131	Eva:	<u>very</u> goo:d!
00132	Pau:	ye::ah!

This excerpt is highly relevant because it evidences how Pau is aware of him being capable of succeeding. This reinforces his motivation to complete the activity by mastering the content and consequentially becoming more confident of his performance, as he feels that he is succeeding. They are aware that there will be a quiz on the following day and there will be a prize for the team who reaches the highest score. Turn 125 evidences not only how Pau feels confident about his mastery of the content, but also about his production in the target L2.

This has an effect on his self-confidence and takes the initiative to talk directly to the tape recorder, to prove that he has reached the objectives of the activity. This is linked to the construction of motivation and initiative in cooperative learning and the notion of group reward.

It is relevant to point out the development in the way the task has been managed by the team members and how the fact that they feel that they have attained the goals has a positive impact in their self-confidence.

Experts group, day 2

The tenth excerpt is taken from the first stage of the second day of the activity, where students in the expert group briefly reunite for a second time to revise the content. This is recorded on the 19th of April, four days later than the previous recording. This excerpt approximately lasts from 02'15" to 02'52".

Excerpt10

00149	Mar:	what are the e numbers/ <u>venga</u>
00150	Pau:	<i>un tros cada un diem(.) no/ tu dius the e numbers (.) the e numbers are the:: (.) aviam (.) com t'ho dic (.) the e numbers i::s (.) e::h an Europe:: (.) saps el que et vull dir</i>
00151	Carles:	<i>explica-ho <u>tu</u></i>
00152	Pau:	only Europe (.) OKEY/
00153	Mar:	hummm::
00154	Pau:	=and the only number::
00155	Carles:	tío (.) <u>venga</u> (.) que nos van a suspender
00156	Mar:	<i>no:: no:: (.) va <u>explícalo</u> que tu lo has explicado bien!</i>

This excerpt further evidences the construction of motivation among team mates and the negotiation of the task within the work group. In turns 149 to 152, Mar takes the initiative of managing the situation and starts negotiating the task with her team mates.

It is remarkable how in turn 155 his team mate Carles uses a threat as a mean to put pressure on Pau and therefore prompt his response. Just afterwards, in turn 156, Mar re-directs that stimulus by praising him and boosting his confidence. This shows two very different approaches towards the construction of motivation in the same team. While Carles puts pressure on Pau by telling him the possible consequences of a failure, Mar uses positive reinforcement to make Pau feel comfortable and encourage him to do his best for the whole group.

It is interesting how Mar takes the role (turns 149 and 156) of the teacher in this group to a certain extent, by managing the task and motivating her team mates. The fact that she is acknowledged as the most knowledgeable other by the rest of her team mates contributes to strengthen the roles that each student complies with in the group.

The eleventh and last excerpt is taken from the same stage as the previous recording and approximately comprises from 02'53" to 03'16", it being taken right after excerpt 10.

Excerpt11

00157	Pau:	<i>ja\ (.) però més o menys\ (.) més o menys\ (.) the e number [are the name of]</i>
00158	Mar:	<i>=is the name (.) IS or ARE the names/</i>
00159	Pau:	<i>is the name used to the products to identify</i>
00160	Carles:	<i>=<u>ahora!</u></i>
00161	Pau:	<i>to identify the products (.) and the E is only used in Europe</i>
00162	Mar:	<i>=<u>molt bé!</u></i>
00163	Pau:	<i>in the rest of the world they don't use any letter\ (.) just numbers\</i>
00164	Mar:	<i><u>very good!</u></i>

This excerpt further develops the figure of Mar as taking the role of the teacher in the expert group. In turn 158, Mar detects a mistake in Pau's utterance from turn 157 and decides to interrupt him. Mar corrects his mistake and poses a question to Pau so he realizes that he has committed a mistake. In turn 159, Pau produces a corrected utterance and consequently, in turn 160, Mar expresses her approval.

Furthermore, Mar uses positive reinforcement to praise Pau after each utterance he produces correctly, as can be seen in turns 162 and 164. It is relevant that Pau uses the target L2 all the time to talk about the content and that he has mastered his part of the content.

The analysis of these excerpts, together with the observation of the rest of the group, points out various patterns that can be extrapolated to the process of learning of other students in the group and a set of common behaviours which are inspected on the following section.

5.2.5. Discussion

After examining the transcripts, some general patterns can be identified in the way the task has been approached by students. The analysis of the set of excerpts supports these findings. In the excerpts evidence of the following aspects can be found:

- The fact of making students work together divided in groups of three does not cause students to give up, even though some students present a very low English competence level.
- Students show a high degree of involvement while their team mates are producing their explanation and pay a high degree of attention to them.

- Students highly cooperate in the construction of the conversation and interact simultaneously.
- Students face the task both in group and autonomously. They manage the task, help each other and save their team members and own face.
- Student's motivation grows as they master the content and it stems from that fact.
- Students self-scaffold their way through the task by using L1 to master the content. Once the content is mastered, they switch to the target L2 to refer to it, as the input is presented in that language.
- Students automatically switch to L1 when they want to socialize or express their feelings.
- Students try to reason the content and create reference points to their previous knowledge in order to master the content. These reference points are shared in the group in order to help the rest of their team mates.
- Student's motivation is influenced by the common group reward and by the common threat of failing the subject as well.
- The heterogeneous group favours the creation of leader in the group who coincides with the most knowledgeable other.

Regarding the expectations set on the students chosen, some of these expectations have been met while some other expectations have proved to be incorrect. Interestingly, both Mar's and Pau's performance is over the expectations for both the teacher's and the trainee-teachers.

Regarding Pau, taking into account his trajectory, the expectations on his performance were fairly low. He was expected to be off-task most of the time, give up the activity soon and not to use English at all. However, he took the activity seriously and, even if it meant a challenge for him, he had the reinforcement of his team members, which eventually led him to master the content and boost his confidence up to producing a speech levelled to the rest of his team members. He does use English a lot more than expected, using the target vocabulary and explaining his part to his team members in English.

He gets really involved and finds his motivation from feeling confident after having mastered the content and being able to explain it in the target L2. He reasons the content and links it to his previous knowledge, he generates doubts while processing the information and asks

his team mates for clarifications. He manages to produce a speech intelligible enough for his base team mates to take notes and manages to get the content across.

Regarding Mar, she was expected to talk in English most of the time and to succeed in the activity. The expectations on her were mostly met. Mar was set in a heterogeneous group with three male students who ranged from a lot to a very low English competence level. This automatically set her as the most knowledgeable other of the group. This led Mar to set herself into the role of the teacher and become the group manager and leader to a certain extent.

Mar manages the timing, the part that each member has to master, the way the activity is approached and gives instructions to the other three members. Moreover, she monitors her team mates' productions both in terms of content and in terms of language. Mar also provides positive reinforcement and protects her team mates' face.

5.2.6. Conclusion

Several conclusions can be drawn from the analysis of the data under the light of cooperative learning. To begin with, it can be observed that students struggle to create meaning out of the content by relating it to their previous knowledge and reasoning it. It is paramount for students that the content forms part of an acceptable theory, that it is instrumentally useful and that it can be linked to reference points provided in society.

In the data, it can be observed how the principles of cooperative learning described by Kagan are tracked, being present in the course of the activity. Students rely on positive interdependence to justify their motivation and support one another in the aspiration of a common goal. Additionally, students develop their individual accountability by being and feeling valuable for the outcome of their group. Students participate equally to a certain extent in the construction of knowledge and interact simultaneously, constructing their knowledge cooperatively.

Resolving complex problem-based tasks promotes the reflective inquiry of students, who share their feelings in group and the goal of creating meaning out of the content. This leads students to expressing their doubts and moments of enlightenment, trying to master a content which initially was beyond their grasp.

In order to succeed in the activity, students resort to self-scaffold their way through the content by using L1 and reasoning the new information. Students in group share their findings, further interacting with the zone of proximal development through the presence of

a more knowledgeable team mate, in an attempt to level all the group members' knowledge.

There is evidence in the recordings that students with different characterization and learning profiles show results which are over the expectations and that students adapt to the task by negotiating and accepting roles. Furthermore, several patterns can be observed in the resolution of the task.

The analysis also supports that knowledge is constructed first in group and later constructed individually. This leads to students' confidence boosting as a result of the mastery of the content. Consequently, they feel more comfortable talking in the target L2 once they have received and negotiated the input of the content with their team mates.

It is remarkable how Pau progresses during the activity. He starts feeling intimidated by the task and assuming that the activity is impossible to be carried out by him, as can be seen in turn 14 (*això és impossible!*). As he uses a series of strategies to achieve the activity, the feeling of success grows in him. This causes him to feel more confident, showing results in his learning, as can be seen in turn 125 (*això és el que se fer, deixaré el llistó alt!*).

On the other hand, Mar also shows a traits of learning, as she takes on the role of the teacher, to a certain extent, and decodifies, reformulates and instructs the rest of her team members. This process of assuming the role of the teacher reinforces her motivation, as she feels that she has to be able to help her team mates, who are experiencing a hard time with the task. This situation promotes her learning significantly, as she has to master it in order to be able to explain it.

A key part of the activity is that students manage to level it to their own standard. The feeling of success is essential to create a link between learning and motivation. As the student feels more and more successful, his motivation towards the activity grows and his learning develops.

Cooperative work proves to be a pedagogical device which allows students to self-adapt the task level to their own needs and learning styles. The results found cannot be generalized, but different studies carried out by other CLIL-SI contributors like Arjona (2006), Calvo (2006), Sanchez (2006), Cordeiro (2007), Fernandez (2007) and Escobar & Nussbaum (2008) point in the same direction.

Even though the analysis results provides several insights into the construction of knowledge in cooperative learning, it also generates certain doubts which would need

further research in order to reach a more profound understanding of the implications of cooperative learning in the EFL classroom.

For instance, the fact that in the research a number of tape recorders were introduced conditioned the response of students to a certain extent. Would the amount of English have decreased if the recorder hadn't been present? Moreover, in the implementation of the activity, taking into account that the activity spanned for two sessions, members of the group were allowed to take notes on the topic that they were not covering. This led to students investing a high amount of time carefully looking at the spelling of the complex vocabulary and taking note of the words they found difficult to retain. Another important factor is what happens to students who fail to cope with the challenge that the activity poses and decide to give up. For instance, among the students observed, one of them, Oscar, seemed to be quite lost during many points of the activity. Is there a way to re-incorporate them to the activity once it has begun? Are there resources to prevent such situation? Regarding the role of the teacher in the activity, to which extent should the teacher help students with special needs?

In summary, cooperative learning has proved to be a valuable tool for teachers and students, which fosters both their capacity to work in group and autonomously. It enhances their self-confidence and it helps catering for the diversity of the group. This way of learning supposes a more motivational variable in contrast with the traditional teacher-led lessons and contributes to creating future citizens capable of working together, interacting with the community and opening up to the world.

6. Reflections on the process of professionalization

These reflections represent a personal approach to all the experiences and feelings the trainee-teacher has lived mainly during her two practicum periods in Institut Garona. When writing these thoughts, it was quite difficult for her to summarize in words everything she has experienced and learnt throughout this practice.

When writing this work the trainee-teacher major purpose has been to leave as many evidences as possible of what she wants to keep for herself as an essential proof of everything that has been important for her during this year. Furthermore, in these following

sections her intention is to show lively pieces of what has happened to her and, more importantly, what she have found out and achieved.

6.1. Practicum I: the initial approach

6.1.1. Practicum I appraisals

The trainee teacher has considered important to refer to her own words, what she wrote at that time. On Sunday, 17th January 2010, after the first week:

“It is very difficult to summarize all the week in 50 words. In general, it has been an intensive and exhausting week but the experience so far is great and rewarding. Since the very beginning, we have been participating in the different classes as two more teachers. We did not stay sitting down in the back of the class, we were standing up and wandering around the class the whole time, helping the students in their group work, asking questions, dealing with vocabulary problems, etc. During the first part of the week I felt a bit inhibited, I didn't know where to put my hands and I didn't know the exact moment where we were supposed to take part as we were interfering with our mentor. So, we decided to assume 10, 15 minutes of each class every day and coordinate the activities. For example, on Friday we ran an activity with all the class about the push and pull factors about migration. They had to list and discuss among the different factors which were the most and the less important. I personally feel much better and comfortable. I appreciate the possibility that our mentor has offered us to start since the very beginning. I think this would be and it has been very beneficial for us”.

And at the end of the period; Monday, 25 th January, 2010:

“During this second week we have implemented the activities we have prepared for the students. In general, all of them worked well and I think we were able to catch students' interest. They have been quite close to us and showed very good behavior. We have also attended several meetings with the psychopedagogue and the headmaster of the high school. For our psychology assignment we have been observing a student with TDAH (Lack of Attention Disorder and Hyperactivity) and I consider that it is very interesting to see how he behaves and his reactions with the different teachers and in various contexts. We also participated in a English Department meeting with our mentor and the rest of the English teachers. It was interesting to see how they discussed about diferent topics. In the end, one of the important points they agreed on was to create a general grid to evaluate students' speaking skills at different levels. As a note to finish on, I would like to say that I

am glad and proud of the work done so far, although I hope to improve and learn more to overcome my possible weaknesses”.

As the trainee-teacher has already mentioned, during the first practicum, which lasted only for two weeks, both trainee-teachers prepared some complementary activities to the Migration Project their mentor has organized and was implementing those days. This period was mainly to start knowing the school dynamics, their mentor, the English Department, the other teachers, the students, etc. Although short, from the trainee-teacher point of view it was absolutely necessary as a way to introduce herself in this unknown context, at least from the teacher's perspective.

6.2. Practicum II: developing as a teacher

6.2.1. Creating materials

When the trainee-teacher and her partner were told that they had to prepare a unit based on Chemistry, they first thought that they would not be able to do it because she doesn't, and she thinks she can say that her peer either, any idea about Chemistry. She was particularly afraid of the students' reactions. In fact, they were not going to do Chemistry in English but prepared an English language unit taking Chemistry as the content base.

It is important to mention that she and her partner have been involved in a special project with two peers from the Science branch of the master who were also doing their practicum in Institut Garona. All of them jointly with their respective mentors in the high school and tutors at the university have been collaborating to produce a CLIL Science unit. Besides the content itself, this CLIL unit included some sessions, and its related activities, which main objectives were to develop the English language skills of the students. At that specific point was where she and her peer took part as the English language experts. In fact, the ones who really implemented a CLIL unit were the Science branch peers. All the materials included in their unit were written in English and regarding the language used in class, was a mixture between Catalan and English. Nevertheless, when the trainee-teachers were in charge of their class, as English language teachers, they always tried to stick to English.

It was really a pity that they had not been able to collaborate more closely in the design of the two units (the Science - CLIL one and the content base). One of the main problems they had was to arrange their schedules.

As the trainee-teacher previously said, when starting to prepare their unit, it represented a great challenge for them. They neither knew how to start nor what specific contents include.

The Science peers' topics were too specific and difficult for non-experts like she and her peer. They had important difficulties to think of interesting and motivating activities for the students. Actually, when they prepared their activities for the first practicum regarding migration it was much easier for them.

Even so, in the end they overcame their fears by doing and redoing things. Besides, her university tutor and secondary school mentor's help they were able to design their unit. In fact, the unit they firstly presented to her tutor had nothing to do with their final version. Not only regarding the contents but also the layout. After all the changes they did, she has realized how important the presentation is to catch the interest of the students.

Because of the lack of time, they decided to give separate worksheets to the students which they had to stick to their notebooks but, as they commented in their feedback activity, students had the feeling to be given too many photocopies. So, regarding what they have considered the most boring part of the unit, some of them answer: "the amount of photocopies", "(papers with exercises) photocopies", "I think that the most boring things are all the photocopies".

Actually, when working on what they called "projects" (as the migration project they were working on during the first practicum period) they are used to having booklets.

6.2.2. An exceptional way of doing classes

During the implementation of the two units, all the student-teachers collaborated closely. She and her peer attended almost all the Science branch peers' sessions and they did the same. In their case, they came mostly for the sessions called "content sessions" (later on, the trainee-teacher explains largely her impressions about these sessions). From her point of view, this way of teaching, although unusual and inconceivable in a "regular" classroom nowadays; four teachers (two content + two English language) in a secondary school classroom, it was extremely enriching, really a success. Although the trainee-teacher is perfectly conscious that what they lived was unreal, she feels satisfied to have had this opportunity.

In fact, the Science student-teachers told them that some students have commented on how useful she and her partner's help was while doing the activities. In the 3rd ESO case, they helped students with language and in 4th ESO, the Science peers were the Chemistry experts. In their case, and regarding the students' feedback, when they asked them about which part of the unit was the most interesting, some of them answered the following: "The most interesting for me was the topics of the project, but I'd like to had more time. I'd like to

learn more about details of chemistry, for example I'd love when one of the teachers explained us chemistry more detailed because she studied it".

6.2.3.4th ESO unit sessions

The trainee-teacher and her peer implemented their unit in two 4th ESO classrooms and even though they implemented some activities together, each of them were in charge of one of the classes.

In her case, the trainee-teacher was in charge of 4th ESO C, a heterogeneous group basically formed of girls. She has to say that they were always nice with her but sometimes they were quite critical, some of them did not see the reason why she was explaining chemistry in an English language classroom. So, she felt demoralized at times. Nevertheless, her mentor told her not to worry much about this because this group of girls is sometimes very critical with everything.

However, she realized how vital it is, since the very beginning of the lesson, to take into account and think carefully about the best way to "sell the unit" to the students. Considering how to motivate them and catch their attention and curiosity to go on. The teacher has to give a sense to what students are going to do, like justify why she is doing this instead of doing that. She understood that they are not willing to accept anything from the teacher.

Moreover, one of the most important things that she also discovered and her mentor made them realized is how crucial it is to give good instructions to the students at the beginning of whatever activity, otherwise they would probably have difficulties to follow the task and it would not be a success. As Scrivener (1994) points out, "unplanned, unstructured instructions are extremely confusing to students. They probably understand only a small percentage of what you say – and guess what you want them to do from one or two key words they did catch. Work out what is essential for them to know – and tell them that – without wrapping it up in babble".

Regarding the overall sessions, some of them were better than others. In fact, it happened more or less the same in the two classes. All of them, her mentor, her peer and the trainee-teacher coincided in that the worse classes were the ones they called "content" sessions. Hopefully, they were able to rearrange the situation. Later on, the trainee-teacher explains in more detail the main sessions and activities they did in their unit.

6.2.4. The former and the latter: Mute slide show I and II

The activity called “Mute slide show” was the one they decided, with her tutor’s assistance and guidance, to use to introduce and finish their unit. They presented the students with a set of photographs related with all the topics they were going to deal with across the unit. They showed them each picture and gave them up to two minutes to write as much as they already knew or could remember about the different topics the pictures were showing. In the meantime, they played some background instrumental music for the students.

The objective of this activity was to know, at the beginning, what the students knew regarding the different aspects they were going to deal with in the unit. In the end, the activity served as well to close their unit. Besides, by means of checking the former and the latter writings, it helped them to notice if the students had learnt or not and what.

During the first session, the trainee-teacher was quite nervous not only because it was the beginning of their unit but also because of the fact that she had up to four Austrian students who were visiting the secondary school those days. She was a little bit worried about their reaction to the activity because as she already knew and she could check afterwards when looking at their writings, their English level was very high in comparison with the rest of my students. But well, at the end, they told the trainee-teacher that they had liked the activity very much, and, in any case, she was perfectly conscious that the rest of the students were the important ones.

One important thing to remark, when comparing these two activities, is that she found that most of the students had improved not only the amount but the quality of their writings. Besides, during the first session they asked her to change the pictures more quickly, before the two minutes finished. They didn’t need the two minutes she was giving them to write because many of them did not have anything to write. Then, during the last session, they asked her precisely the contrary, to give them much more time to write, showing that they had many more things to write. In the last session, what also happened was that the music stopped before finishing the mute slide show had finished and the students requested the trainee-teacher to play the music again. She could realize that the music suggested them to write and was helping them to concentrate on the activity.

Taking into account the use of music in the classroom and the different teaching methods throughout history, it can be find suggestopedia, which is a strange approach originally developed in the 1970s by the Bulgarian educator Georgi Lozanov. This method was based on the power of suggestion in learning that is achieved by means of creating a relaxed state in the learner. Music is central to the Suggestopedia to stimulate all levels of mind.

6.2.5. Content classes

They prepared a PowerPoint presentation to explain the four main points in the unit: Chemistry in diet, chemistry in personal care products, chemistry in medicine and chemistry in household cleaning products. At the beginning, they thought that they would be able to give all the information in two sessions but it was not possible. In the end, the trainee-teacher and her peer needed three sessions to finish all this “content” part of the unit. In the first two sessions, she managed to explain the three first topics and she left the correction of one exercise and the last topic, chemistry in household cleaning products, for the third class.

The two first “content” sessions were the worst, taking into account the entire unit. The two student-teachers gave a bad model to the students because they tended to read the PowerPoint instead of explaining the content of the slides and moreover without giving the students the opportunity to talk. They focused on themselves and forgot the principals of the construction of knowledge in the classroom context.

According to Mercer (1995), knowledge exists as a social entity and not just as an individual possession. To think of ‘knowledge’ only as an individual mental possession does not do justice to the capabilities of human beings. In Mercer’s opinion, the essence of human knowledge and understanding is that is shared.

Consequently, it would have been advisable to take advantage of open questions (the ones that are likely to receive a long answer) and relate the content with the personal experience of the students in order they would have had the chance to give their opinions.

Regarding the teacher talking time, Scrivener (1994) emphasizes that the more a teacher talks – the less opportunity there is for the learners. They need time to think, to prepare what they are going to say and how they are going to say it. It is necessary to allow them the time and the quiet they need. Don’t feel the need to fill every gap in a lesson and explore the possibilities of silence.

From the trainee-teacher point of view, after these two sessions the students ended up bored and she would say quite demotivated with the unit. Some of their feedback related to the most uninteresting part for them also showed her feelings: *“theory. Because it was boring and a little bit repetitive”*, *“The part of theory and the power point when we did all the photocopies”*, *“when we learn the meaning of the colourants, flavour enhancer, etc.”*, *“the theory in classroom with the slides”*, *“the pwp and all of photocopies”*, *“the power points but all are very interesting”*. Fortunately, the trainee-teacher was able to engage the students again.

After these sessions, she also felt demotivated and worried regarding the unit and the students. Her partner had already implemented the third “content” day class and the dynamic was the same. The trainee-teacher had her class two days after and she decided to change the session completely. From her experience, it was quite difficult to think about interesting activities on the topic of household cleaning products. But in the end, she managed to find a funny video, in a cartoon format, -a very short one, only 1 minute- to introduce the topic and then, after turning it over in her mind she got an idea. As they had already prepared an activity that dealt with chemical hazard labels she decided to go to the supermarket and took photos of the household cleaning product labels. Then, she prepared different packs of images and the activity she made up consisted in the following:

She organized the class in groups and she gave each group a set of images. Looking at the photos they had to discuss the following questions:

- What are these products used for?
- Do they contain any dangerous substances?
- What do they have in common?

Then, each group had to comment the images and the answers aloud with the whole group. (Each group had different pictures, some of them were the same and others were different). The previous video and this activity helped the trainee-teacher to catch the interest of the students on the topic. Later, she did the jigsaw reading they had already prepared when first designing the session.

The only inconvenient the trainee-teacher found in this session was the lack of time. This session was before the break, in the morning, and these classes, always last only 55”. She could realize the importance of these five minutes to complete properly the session. Nevertheless, she was conscious that at this point, the teacher’s perspective is not the same as the students’. According to Sanmartí (2002), *“habitualmente, para el profesorado una hora de clase es un tiempo muy corto, pero el alumnado se le puede hacer muy larga. Cuando se observan clases grabadas en video, se puede comprobar fácilmente que la percepción del tiempo es muy distinta desde los dos puntos de vista, debido a que, muchas veces, la actividad del que enseña es mucho mayor de la que los que aprenden”*.

When the trainee-teacher finished, she felt pleased and proud with the outcome. Moreover, the language assistant, congratulated her for the work done and her mentor told her: “So

far, this has been the best session in the unit". This class was the last one after the Easter holidays so she left the secondary school glad and satisfied.

6.2.6. Expert's group activity

This was one of the key activities in their unit that was based in the principles of cooperative learning. Some authors define the technique implemented as "puzzle". According to Kagan (1985, cited by Escobar and Nussbaum, 2008), in the "puzzle", the academic contents that have to be studied are shared among the students that formed a team. These have to interact with the aim of sharing all the information, what it means that each member of the team is responsible of teaching his/her knowledge to the rest of the group and learn everything his/her mates teach them.

From the trainee-teacher point of view, it was one of the most difficult to design. In fact, as they did with other tasks, they reformulated their initial idea. One of their main worries was to decide if it would be advisable to deal with two, three or four topics. At the beginning, in the first version of their unit, they had thought of presenting the students with two new and everyday life topics in which chemistry was involved: coffee and fuel. But, after many deliberations and hours of discussion with her partner and her mentor and seeing how the sessions were going on, they decided that the best option would be to deal with the same topics, the 4 ones, that they had been working with throughout the unit. They all considered that, finally, it was a great decision that helped them, in some way, to close "the circle of the unit" and the students to revise and consolidate the main ideas of the whole unit.

Another key aspect when deciding the final version of this activity was the groups' formation. One day the trainee-teacher spent with her mentor more than two hours practicing mathematics exercises and trying to find the best combinations to arrange the students in the different groups taking into account the different amount of topics. The fact of having two, three or four topics also implied deciding on the days they wanted to dedicate to the activity: one, two, three maybe? They considered that even if they did two topics, one day would not be enough to implement the activity successfully taking into account that they had the final quiz. Regarding three topics, when thinking about the different possibilities of the groups, three, for them, was not the best option number to choose. In the end, they did the four topics and they spent two days on the activity. One important thing to remark is that they did the activity in a B hour and they divided the group (once a week the English classroom is split up in two groups. One half of the group goes to the language room, where they have CD players and computers). They thought that this way it would be easier to organize and to manage the activity.

This activity was also important for them because they decided to analyze the students' conversations afterwards so they used tape recorders to record how students discussed and shared the information in this collaborative task. Therefore, each group had another element, the tape recorder that they were not allowed to stop throughout the process.

After the implementation of the activity, (the second day in 4B, her partner's group) they had a post-experts' group meeting with her mentor, her peer and her tutor, who came to see them that day. The student-teachers, as the teachers in charge who had implemented the activity, gave their personal opinion about how it had gone. In general, they were quite satisfied regarding the final result but they were conscious that many things would have been improved. They all agreed that this kind of activity has a complex organization in which the teacher has to prepare a lot of materials, although they can be used afterwards.

One interesting thing to remark was that they gave the students the opportunity to choose an easy or a difficult version (depending on the classroom) of the experts' group card but nobody decided to change their card. Regarding the cards, they gave one card per each student but as her tutor told them, it would have been advisable and useful to improve the interaction among the students, by giving them only one or two cards per group. Sincerely, when doing the activity they did not consider this aspect. Furthermore, as her tutor pointed out, if the resources are restricted, this forces the students to cooperate.

It would have been also desirable in their case, to reinforce the idea of the team -the team spirit- among the groups, for instance, looking for a name for each team.

Before going back to the initial groups, they gave two questions to each expert's group and the students had also to think about another third, to rehearse and prepare their topic as much as possible before explaining their topics in the home's group. From the trainee-teacher point of view, this small activity was very useful to refresh the students' concepts from the previous session and to give them more confidence when explaining their topic to the initial group.

Going back to their initial groups, and when each one was explaining his/her topic, students were allowed to take notes that helped them in their process of memorizing the most significant information for the final quiz.

6.2.7. Oral presentation

According to the main objectives the two trainee-teachers decided their students had to achieve in their unit, they had this speaking activity. They made the students prepare an

oral presentation. Students had different topics to choose from and, in pairs, they had to prepare one of them using a poster as a visual aid to explain afterwards their topic to the rest of the group. As in the experts' group activity, the two trainee-teachers considered that it would be useful to divide the class, as in B hour, to speed up the students' oral presentations.

The trainee-teachers explained the activity in class and they uploaded in the Moodle the instructions of the presentation and some useful links where students could find the information. They were free to decide the content of the presentation but the trainee-teachers commented to them that it would be compulsory to include some key words regarding each topic that they gave them.

The oral presentation had to last approximately 5 minutes per couple and in general, the trainee-teacher was proud with the results, although some of the students did not consider the activity as important as she did. In her class, some of the students were missing that specific day and the trainee-teacher and her mentor were a bit suspicious with the reasons students gave them later regarding these absences. Maybe, it was partly her fault. Actually, the trainee-teacher considers that one of the mistakes that she made with this activity was that she did not explain sufficiently or clear enough that this oral presentation was an important part in the students' final mark. In fact, it was the final outcome of the unit as the basic objective was the communicative approach and the development of the oral skills.

In the oral presentation, each couple received a mark both from the trainee-teacher and the rest of the classmates, who also had to give a mark to their mates. The two trainee-teachers knew from their mentor that this was not the first time students were evaluating their mates and that they had already worked in class the characteristics of a good oral presentation. The point here was that the two trainee-teachers omitted this part; they did not explain anything about what they were supposed to take into account to give the marks. Then, from the trainee-teacher point of view, she believes that it would have been especially useful to revise the important points to consider when evaluating an oral presentation. Afterwards, the trainee-teachers have added in the teaching notes of their unit a set of assessment tools to fulfill this lack of guidance and self-assessment.

According to students' feedback, this activity was one of the ones they liked the most: *"The presentation in pairs, I'd learn a lot of interesting things", "the posters of the class mates, because I learnt a lot of chemical reacts", "the oral presentations. Because I have learnt a lot of curious chemical reactions of daily life", "when we work in pairs and make a poster and after explain to our friends"*.

6.2.8. Consolidation game

To close the unit the trainee-teachers decided to prepare a consolidation game. They used the same format in 3rd ESO and in 4th ESO but they changed the questions and the responses to adapt them to the content. The trainee-teacher felt really impressed to observe that the students were so involved in the game and that they were answering in the right way.

When she was about to finish and say goodbye to the students she had a sense of emptiness. They had been her students during several weeks and she felt sad to have to abandon them. She told them that both, her partner and she, were really proud to have been teaching and helping them. Moreover, she thanked the students for their collaboration and support. In the end, all the class gave her a warm applause. That was really moving.

6.2.9. 3rd ESO classes

As she has already mentioned, the two trainee-teachers collaborated with their two teacher-in-training mates from the Science speciality of the master, they assisted them to organize some activities. The Science mates were really implementing a CLIL unit. They prepared all the materials in English and the implementation of the classes was partially in English and in Catalan. In the end, the trainee-teachers attended almost all the Science mates' sessions and they took the responsibility to implement various tasks. One of the activities the trainee-teachers prepared for the 3rd ESO students was aimed to make them practice on how to write a lab report in English. Afterwards, when the students had to write their own lab report of the red cabbage experiment they all did it quite well. Later, the trainee-teachers prepared students another activity in which they had to deal with the formal style in an e-mail in order to produce then a reply. Finally, the trainee-teachers did the consolidation game, as in 4th ESO. It is important to point out that they did the game firstly in 3rd ESO and even though the students really enjoyed it, the noise in the classroom was considerable. In fact, the teacher from next classroom told them to lower the volume because they were not able to work properly with the amount of noise. So, when the trainee-teachers did the consolidation game in 4th ESO they were slightly afraid of the noise but surprisingly it was different, their students were not so noisy.

When the trainee-teachers helped their Science mates to correct the lab report and the article, they were really impressed to observe that the differences between the 3rd ESO and 4th ESO productions were not so remarkable. Probably, the reason was the fact that some of the 3rd ESO students had already been doing some terms of other content

subjects in English. As the English language teachers, the trainee-teachers were responsible to give these students a percentage of the final mark of these assignments.

The trainee-teacher personally believes that it was really interesting to collaborate in the Science classes, the same as it was to have her mates support in hers. It was really an enriching experience for all of them but they commented various times that maybe it has been a shame to have not had sufficient time to prepare the two units more closely.

6.2.10. Batxillerat classes

Since their mentor is the 2nd Batxillerat teacher, during the first and the second practicum both trainee-teachers have been helping her with several tasks in the classroom and also in the language room. The trainee-teacher has realized that teaching in 4th ESO and in 2nd Batxillerat it is not so similar. At the beginning, she had the notion that Batxillerat students would be more responsible with their homework and that they would study harder - in comparison with ESO students - as they are going to start university next September. It was not exactly this way. It surprised her that some of them were really lazy and did not seem to worry much about their marks. They looked discouraged, mainly the ones that are taking the course for the second time. Nevertheless, as the rest of the students from 4th and 3rd ESO were all really kind with her.

The trainee-teacher could realize that in 2nd Batxillerat classes the dynamics and the teaching objectives to achieve by the end of the course are rather different from the ones in 4th ESO. In fact, these students are studying the second year of a post obligatory course and they have the Selectivitat exam, a compulsory test that gives access to the university. On the other hand, the 4th ESO students are taking an obligatory course and although the aim is that they have to learn as much as possible, there are different levels among the students and they all have diverse interests when finishing this course. Therefore, in 2nd Batxillerat they mainly practiced and did tasks that focused on developing reading and writing skills, taking into account the Selectivitat exam. However, in the B hour, they have once a week, they also practiced listening and speaking with the key support of the language assistant.

Once, during the second practicum, the trainee-teachers were in charge of a 2nd Batxillerat class, the science one, Batxillerat A. In that class, there are numerous students, specifically more than 35. The class went well but they have to control the whole time the amount of noise because the students tended to talk too much. Certainly, as they were alone without their mentor, students felt freer to talk.

Besides the amount of students in that class, at the beginning of the course they were 39, their mentor has the valuable ability to be sympathetic with the students but at the same time she is able to make them to be quiet only by means of making a silence or only staring at them.

6.2.11. Aula oberta

Institut Garona has an aula oberta which is formed by 9 students from 4th ESO, all of them boys. The teachers in the Psychopedagogy Department commented to the trainee-teachers that they advised some girls that it would be useful that they attended the aula oberta but they did not want to go by no means. During her practicum, specifically the second period, the trainee-teacher attended a few classes in the aula oberta and she observed several aspects that caught her attention. First of all, in the aula oberta classes teachers have decided to implement a kind of 1x1 system. This means that each student has a laptop (belonging to the secondary school) that they use to work on the different contents of the subjects and the tasks. The teacher uses the Smart Notebook where he writes, as it was the blackboard, everything they do.

Some of them do, but she observed that the vast majority of these students did not write much. In fact, although the teacher told him repeatedly to hurry up, one of them spent almost half the class trying to find the power supply to be able to charge his laptop. It surprised her that all of them talked in Spanish (among them and when asking the teacher, who spoke in Catalan). In one of the sessions, they were working on a physics problem related with densities, volumes, mass, etc. and they did it using the example of the alcoholic drinks and the alcohol test. It seemed to the trainee-teacher a great idea because even though, in general, they were not writing, they were paying attention to the development of the problem. She believes the reason was the fact that the topic interested them a lot. The teacher was able to engage them in the problem using a motivating topic for them.

The trainee-teacher considers that perhaps it would be a good idea to use this kind of method to motivate students to learn in other classrooms not only in the aula oberta. As she has already mentioned at some point, she believes that one of the main challenges of being a teacher nowadays is the fact to be able to motivate the students. Therefore, one possible and effective way could be linking the subject contents with reality and with topics that could awake the interest of the students as she observed in the aula oberta.

6.2.12. Primary school visit

Since their 4th ESO students were in Rome enjoying their final course journey, their mentor and the headmaster managed to talk to a primary school in Garona to go and visit them. They prepared the two trainee-teachers a two day schedule (8-9 April) mainly filled with English classes taking into account different levels from P-3 (kindergarten) to 6th Primary.

She considers that it was a great experience. Everybody welcomed them warmly and they were all, the teachers and the children, lovely with them. The trainee-teacher believes that it was a great opportunity to observe the differences between a primary and a secondary school, regarding the students and the development of the lessons. She loved the children but she realized that primary students need the teacher's attention all the time and that it is necessary to change the activity quickly otherwise they start to talk and to move. The trainee-teacher has to recognize that she did not remember that in primary the children were singing and painting all the time. In fact, they asked the teacher from time to time: Can we paint? Or can we sing? In the 1st Primary classroom, a group of girls insisted the teacher that they wanted to show the two trainee-teachers a choreography they had prepared. It was wonderful to see them singing and dancing, they did it really well.

The trainee-teachers could observed several activities the students did related with knowing the colours and numbers in English (P3) or identifying different types of animals and what they do (1st Primary). The primary teachers also showed the trainee-teachers what students have been doing some days before. They have just celebrated "The English Day" for the first time. Each class, from the smallest to the oldest, took part in this celebration. Every course represented a different English country for example; Ireland, Australia or United States and they prepared different activities. One of the final outcomes was a beautiful poster they had in the corridor and that they made up with the help of each class.

After those two days the trainee-teacher felt happy and willing to work in a primary school. Nevertheless, she thinks that she would like to do it but without any doubt, she would have to learn a great variety of games to play and activities to do with them otherwise she realizes she would not be able to manage the class.

The trainee-teacher was really impressed with some "techniques" the primary teachers used. For example, she loved the way teachers used to make students to be quiet. "Shhhhhhh shhhhh stop that noise, shhh shhh stop that noise..." using not only their voices but also their hands and expression. Or, for instance, in order to motivate them in an activity, mainly with the smallest ones, teachers repeat and repeat singing: "It's so easy, it's so easy, it's so easy ..." The trainee-teacher really appreciated the possibility they gave them to visit and be part of a primary school for two days.

6.2.13. Secondary school visit exchange

In their case, the two trainee-teachers visited Institut Emily Brönte¹¹ in the metropolitan area of Barcelona on the 21st April. Their master classmates from Emily Brönte had come to visit them the day before. The exchange was significant in the sense that they had the opportunity to get an overview of another school.

During their visit, they went round the school with the mentor and she showed them almost all the classes, the department, the art class, the informatics class, the library, etc. Personally, the trainee-teacher found very interesting when the mentor explained the story of the secondary school and the differences throughout the years regarding the facilities and the students. The two trainee-teachers could not avoid comparing their secondary school with Emily Brönte. They realized that the two secondary schools, each one has positive and negative points if one compares them but, in general, the trainee-teacher has to say that she felt really welcomed. She could also experienced, like in Garona, a good atmosphere among the students and the teachers.

Besides, she really enjoyed the activity her mates from Emily Brönte had prepared to finish their unit in 4th ESO. They prepared the students a gymkhana to summarize all the contents they had already learnt during their unit about Egypt. Our partners made us participate in order to help them. The trainee-teacher could see that the students actually appreciated the activity.

7. Conclusions

Taking into account the theoretical framework of this dissertation, the trainee-teacher has thoroughly analyzed, in the first study, the number of strategies she uses to teach content, incorporating the students' active participation to the development of the class.

She aimed at evaluating how communication and interaction is achieved among the different characters of the play: teacher and students, by examining the resources the trainee-teacher made use of. She considers that teachers are not simply book describers. So, from this comparison, she wants to show that, in the goal of teaching, and mainly "educating" or "contributing" to the development of teenagers, it is important to be a good communicator and to be competent enough to use all the resources available.

¹¹ Emily Brönte is the secondary school the two trainee-teachers visited

Regarding the construction of knowledge in the language classroom as an interactive process, the trainee-teacher has realized how important is it to promote involvement in class using questions or other resources which foster the students' participation.

The second empirical study focuses the attention in students. Several conclusions can be drawn from the results obtained. To begin with, it can be observed that students struggle to create meaning out of the content by relating it to their previous knowledge and reasoning it. It was observed that this kind of activity promotes the reflective work of students, who share their feelings in group and the common goal of creating meaning out of the content presented.

The trainee-teacher has observed evidences which demonstrate that this way of learning increases the students' motivation and enhances their abilities to work both in groups and autonomously.

Taking into account the personal reflection of the trainee-teacher, she believes that it has been hard and demanding, but now she can firmly state that all the efforts invested have been extremely worthy.

In reference to the didactic unit created, besides the tutor's and Science trainee-teachers' help, she still considers that it has been a big challenge for the student-teachers to design a unit based on Chemistry. At the beginning, they felt lost but, in the end, they were able to create a final product which they felt satisfied with.

Regarding the implementation, she has always tried her best, overcoming her weaknesses and improving her strengths. Under her point of view, she was completely aware that one of her main weaknesses was her lack of confidence regarding her English competence. This was not the first time that she was teaching, but it was the first time that she was teaching in English. And, although she thinks she has improved a lot during her practicum sometimes she felt nervous and insecure, especially at the beginning. Possibly, these fears root from her way of thinking or her personality in general terms. Additionally, the fact that she is extremely self-demanding and a bit negative at times also had an impact on her performance.

Now, the trainee-teacher can say that, as time has gone and she has taught more and more lessons, she has felt more comfortable and confident with her English. Furthermore, she is quite sure that she also has many good qualities as a future secondary school teacher. In fact, she thinks that one of her most important strengths is her ability to be aware of what is happening in the classroom. She can detect when a student is not paying attention, is bored or is chatting with another student quite unconsciously. Maybe it is

thanks to her previous teaching experiences. Also, she has the feeling that, somehow, she “connects” with students. Obviously, she is aware that it is impossible to appeal to everybody, and that this thought would not be realistic. Nevertheless, she thinks she is quite “warm” and that students notice and appreciate this feature, but she realizes that she has to be careful because sometimes she tends to get too emotionally attached.

From every experience and feeling she has experienced, she has come up with some important facts, at least for her. The trainee-teacher has realized that nobody and no teacher is perfect. Moreover, if one wants to do a good job and be responsible, teaching at a secondary school is not easy, as it is traditionally said. In fact, it represents a daily challenge and she only hopes to rise to the occasion when she has the opportunity to start teaching at a secondary school again.

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9. Appendixes

9.1. Transcript analysis – First empirical study

NAME	ROLE	GENDER
AP	mentor	purple
JA	teacher	yellow
HM	peer student-teacher	blue-green
SF	female student	gray
SM	male student	pink
SS	several students	green

URNS	NAME	UTTERANCES	VISUAL INFORMATION
001	AP:	ok	
002	HM:	∞ (xxx) this one or ∞	
003	JA:	well, uhhh here you can see that there is a map, and	((pointing at the ppt)) ((moving
004		you can see different arrows. do you see it? the colors	hands))
005		are a bit, you now (xxx) uhhh	
006	HM:	(xxx) we can see	

007 JA: yeahh, you can see. so uhhh the arrows, and you can
008 see that uhhh (.) the larger the arrow is (.) is the more
009 people that migrate. so, uhhh you can see that=
010 SF: ((coughing))
011 JA: =perhaps (.) what do you see here in America? people
012 arrive to America or [they]?
013 HM: [ok, do they]?
014 JA: [they leave]
015 SF: arrive
016 JA: they arrive
017 HM: ok so, we have (.) ok people emigrate or immigrate to ((moving)) ((pointing at the ppt))
018 America?
019 SF: immigrate
020 SM: immigrate
021 HM: ok (0.1) ((shaking his head))
022 SS: no
023 JA: ((laughing and moving hands))
024 SS: emigrate
025 AP: [emigrate]
026 JA: [EMIGRATE TO America] ((moving hands))
027 HM: [EMIGRATE TO] America, ok, from (0.3) we have ((moving hands))
028 Europe, Asia, Africa? (0.4)
029 SF: (xxx)
030 HM: ok (.) well, there seems to be quite an income from ((pointing at the ppt))
031 Asia, no? this is a very large arrow
032 JA: ((pointing at the ppt)) ((nodding))
033 HM: ok, there seems to be quite a few from Europe as well, ((moving hands)) ((pointing at the
034 no? according to quite a thick arrow ok? Do people, ppt)
035 (0.2) eehmmm emigrate to Africa? ((scratching hair))
036 SS: No
037 HM: no they don't. uhhh, yeahh well, :this seems (.) like we ((pointing at the ppt)) ((laughing))
038 are talking about the case o:f, of slavery no?
039 JA: ((nodding))
040 HM: and human trade and this kind of stuff, but (.) mmm for ((laughing)) ((moving)) ((pointing
041 example, do peopl:e immigrate (.) do people emigrate at the ppt))
042 to?=(0.2)
043 SF: south
044 HM: =to South America?
045 SF: no
046 SS: no
047 HM: yes, they do? or no, they don't?
048 SS: no, they don't
049 HM: no they don't at all. ok. good. ok, let's move on
050 JA: ok, here you have uhhh people on the move uhhh ((pointing at the ppt))
051 related to the States, Mexico, Europe and Asia. It's like
052 a summarize of what we are saying. so, United States,
053 uhhh, you can see here that more people move to the
054 United States than any other country but - uhhh 31 one
055 million people in the US were born uhhh, (xxx) not in
056 the US but in other [countries]
057 SF: [countries]
058 JA: yes. and Mexico uhhh, Europe as well, similar to the ((moving hands))
059 United States and Asia. do you think people in Asia
060 uhhh are emigrants or immigrants? they receive or (.)
061 they (.)?
062 SF: they move (xxx)
063 SM: ((coughing))
064 JA: °ok, very good. do you want to add something about ((looking at M))
065 this slide? no?°
066 HM: ok, so, people emigrate from Asia and they immigrate ((pointing at the blackboard))

067		to (.)	
068	JA:	Europe or [the States]	
069	HM:	[Europe] or the United States mostly, ok. so,	((pointing at the
070		people in Asia mostly, we are talking about, well, it	blackboard))((looking at the ppt))
071		doesn't say [any]	
072	JA:	[no, no]	((looking at the ppt)) ((nodding))
073	HM:	=any cipher	
074	HM:	but, they emigrate from Asia to and they immigrate to	((touching the blackboard))
075		the United States, ok. so, we have these concepts.	
076		good. ok.	

9.2. Transcript conventions

Transcription conventions adapted from Richards and Seedhouse (2007):

Indicates the point of overlap onset	[
Indicates the point of overlap termination]
Turn continues below, at the next identical symbol	=
An interval between two utterances	(3.2)
A very short untimed pause	(.)
Underlining indicates speaker emphasis	<u>word</u>
Indicates lengthening of the preceding sound	e:r the:::
Rising intonation	?
Low – rising intonation	,
Falling (final) intonation	.
Especially loud sounds	CAPITALS
Noticeably quieter than surrounding talk	o o
Considerably quieter than surrounding sound	oo oo
Higher or lower pitch in the syllable following the arrow	^ v
Unclear or unintelligible speech	(xxx)
Non verbal actions	(())
Italics indicate code switch to <i>Catalan</i>	<i>word</i>
Bold text indicates code switch to Spanish	word
Rising intonation, not necessarily a question	/
Falling intonation	\

Relatively quiet volume
 Lengthening of the word

[word]
 w o r d

9.3. Image captures from the video



9.4. Transcript analysis – Second empirical study

List of Participants:

NAME	ROLE	GENDER
MARC	Trainee-teacher	Male
MAY	Teacher	Female
Mar	Student	Female
Pau	Student	Male
Carles	Student	Male

Eva	Student	Female
Laia	Student	Female
Oscar	Student	Male

EXPERTS GROUP 15th April - Mar, Carles, Oscar, Pau

- 00001 **Oscar:** me tengo que memorizar todo eso/
 00002 **Oscar:** y porqué/
 00003 **Pau:** yo que sé\
 00004 **Oscar:** me tengo que memorizar todo eso/
 00005 **Oscar:** y para cuando/
 00006 **Carles:** para ahora\
 00007 **Oscar:** y que (.) lo tenemos que decir sin papel/
 00008 **Oscar:** pero qué me dices tio/
 00009 **Mar:** ehm... *hem d'apendre això*/
 00010 **MAY:** you have to understand\ and then you have to try and explain the others in your own words\ YES/ (.) I don't know if you will be able to write down [some words]
 00011 **Pau:** *jo no m'entero de res*
 00012 **Oscar:** **yo no me entero de nada**
 00013 **MARC:** okey (.) so you will have to help each other\
 00014 **Pau:** *no no (.) això és impossible*
 00015 **MARC:** if you read it aloud maybe it will help you (.) but it's up to you (.) okey/
 00016 **Oscar:** **yo si quieres me apendro una linea**
 00017 **Pau:** food additives are substancesss (0.5)
 00018 added to food\ (.) ya está\
 00019 **Oscar:** **yo la primera!**
 00020 **Mar:** *pero tio que no t'has d'apendre(.) ho has d'entendre i ja està*
 00021 **MARC:** YES
 00022 **Pau:** *jo només memoritzo les paraules en negreta*
 00023 **Oscar:** *si (.) jo també*
 00024 **MARC:** it's okey to use Spanish or Catalan
 00025 **Mar:** a:: oke::y
 00026 **Mar:** *diu que:: que:: els foods additives es posen al menjar (.) per conservar el sabor(.) o l'aroma:: o que:: o sigui (.) que es vegin millor (.) saps/
 00027 **Pau:** *per l'olor també(.) veritat!*
 00028 **Mar:** *si (.) porque tinguin millor apareença*
 00029 **Carles:** *ah va*
 00030 **Mar:** *i que s'ha usat durant molts anys (.) i que això es va introduir fa vint anys (.) o sea (.) s'han fet lleis\ (.) per poder reconeixes\ (.) els food additives\
 00031 **Mar:** *i que cada aditiu te un nombre assignat\ (.) que comença per la E\ (.) i el nombre nomès a Europa\ (.) a Europa es posa la e\ (.) als altres països nomès el nombre\
 00032 **Pau:** **ah vale **
 00033 **Mar:** *i llavors (.) aquí diu que (.) hi ha polèmica sobre si els aditius aquests (.) són bons o dolents porque alguns han-
 00034 **Pau:** =perque alguns han donat problemes\ (.) no/
 00035 **Mar:** *SI (.) maleitiesss i coses d'aquestes (.) com obesitat (.) i problemes de col\ (.)
 00036 **Mar:** ehm...*****

- 00037 **Mar:** *i que no és bo consumir un gran nombre d'aditius (.) pero si (.) si no consumeixes gaires també és bo (.) perquè nosaltres també estem formats de químics*
- 00038 **Pau:** *boníssims ee:::*
- 00039 **Mar:** food additives are substances added to food to preserve the taste (.) or the flavour (.) and make it look better\ (.) this process has been used for years\
- 00040 and it's used (.) like preserving sweets o:r
- 00041 **MAY:** =in food (.) in general
- 00042 **MAY:** if you do it in Catalan it's okay\
- 00044 **Carles:** =and to regulate each additive is assigned an e number
- 00045 **Mar:** **no\ vamos por aquí**
- 00046 **Carles:** *pero si això ja ho has dit*
- 00047 **Carles:** this is used only in Europe\
- 00048 **MAY:** =what is it used just in Europe/
- 00049 **Carles:** the e number\
- 00050 **MAY:** and in the rest of the world/
- 00051 **Carles:** just numbers\
- 00052 **Pau:** food additives *què vol dir/*
- 00053 **Mar:** *eh/*
- 00054 **Pau:** food additives
- 00055 **Mar:** *són substàncies*
- 00056 **Pau:** a: substances
- 00057 **Mar:** food additives
- 00058 **Pau:** [*són substàncies*]
- 00059 **Mar:** *com colorants*
- 00060 **Pau:** a:: *d'acord\ d'acord*

Home group - Laia, Pau, Carles, Eva

- 00061 **Eva:** the personal care
- 00062 **Pau:** =*de què parles/*
- 00063 **Eva:** *de cosmetics*
- 00064 **Pau:** [*de cosmetics*]
- 00065 **Eva:** the personal care is the industry that is used for change the appearance (.) okay/ for for =very good\ (.) **ya está**\ (.)
- 00066 **Laia:**
- 00067 **Eva:** *no:::*
- 00068 **Eva:** to look beauty\
- 00069 **Carles:** to *què/*
- 00070 **Eva:** to look beauty\
- 00071 **Laia:** to look very pretty\ (.) *no/*
- 00072 **Eva:** the personal products use soaps (.) sunscreen (.) fragrances
- 00073 **Pau:** =*com la meva! custo Barcelona!*
- 00074 **Laia:** I'm talking about chemistry in medicine\ (.) or about medicine in chemistry!\ I don't remember!\
- 00075 **Pau:** chemistry *què/*
- 00076 **Laia:** okay\ (.) blood analysis\
- 00077 **Pau:** *de què parles/*
- 00078 **Laia:** do you know anything about blood analyses/
- 00079 **Eva:** yeah\
- 00080 **Laia:** yes\
- 00081 **Laia:** blood analyses test test (.) amount the potassium and sodium

ehemmm (.) **no se qué**\

00082 **Laia:** a:\ cla\ sÀ sÀ sÀ

00083 **Laia:** blood analyses te:st te:st (.) amount te:st te:st

00084 **Eva:** okey mister teacher!

00085 **Laia:** I don't know *si és test o tests*

00086 **Carles:** =és igual!

00087 **Pau:** =és igual!

00088 **Laia:** test among potassium and sodium of our blood\ (.) okey/

00089 **Carles:** no\

00090 **Laia:** very difficult e:/

00091 **Eva:** the banana contains potassium

00092 **Carles:** about those *què*/

00093 **Pau:** sodium\

00094 **Eva:** of our body\ (.) **vale**\

00095 **Pau:** we are taking about/

00096 **Carles:** =we are taking about/

00097 **Pau:** =food additives\

00098 **Carles:** =food additives\

00099 **Pau:** *tu què* (.) *et el eco*/

00100 **Carles:** food additives are things to preserve the flavour (.) the texture

00101 **Carles:** =the texture (.) the [textúre] and these *coses*\ (.) *saps*/ (.)

00102 additives

00103 **Pau:** =to have a better look to the products\

00104 **Pau:** it gives a better look\

00105 **Eva:** yeah\

00106 **Pau:** it's like make-up\ bu:t (.) a:nd (.) **ya tu sables**

00107 **Pau:** the e number\ *saps*/

00108 **Laia:** can you spell that/

00109 **Pau:** yes yes!\ e\ (.) **guión**\ (.) number

00110 [laughs]

00111 **Carles:** e number\ (.) okey/

00112 **Pau:** **una cosa** (.) **eso de la e** (.) **qué era**/

00113 **Pau:** **que no me acuerdo**\

00114 **Eva:** *és per lo que esta regulat el producte* (.) *no*/

00115 **Pau:** *què volia dir allò de la e/ ens ho ha explicat abans* (xxx)\

00116 **Eva:** =*edulcorants*\

00117 **Mar:** *és el numero que sel's hi assigna als products*\

00118 **Pau:** =**pos ya está**\

00119 **Laia:** it's the number tha::t/

00120 **Pau:** =it's the number that they assign to the products\

00121 **Carles:** =it's a number they assign to the products to recognize them\

00122 **Carles:** =to recognize them\ (.) to recognize them\

00123 **Pau:** =*qui ho està fent company* (.) *tu o jo*/

00124 **Carles:** *els dos*\

00125 **Pau:** *un moment* (.) *un moment* (.) *que això és el que ser fe*\ (.) *deixaré*
el llistó alt (0.5)

00126 **Pau:** the letter e me:ans the: the: Europe\ *saps*/

00127 **Eva:** yes/

00128 **Pau:** yes\

00129 **Eva:** and the number/

00130 **Pau:** the number just the products\

00131 **Eva:** very goo:d!

00132 **Pau:** ye::ah!

EXPERTS 19th April (Mar, Carles, Oscar, Pau)

- 00133 **MARC:** just try to remember\ (.) e::hmm (.) you were in the same group\ (.) so you all know how to answer this\ (0.4) what are the e numbers/ give some examples of natural food additives\
 00134 **Pau:** =això ja::
 00135 **MARC:** =and you will have to make sure that you know how to you explain this to your partners when you go back\ OKEY/ so you will have to make an extra effort\
 00136 **Mar:** bu::t (.) ehmm:: (.) natural food additives (.) sugar is/
 00137 **MARC:** =try to make sure that everybody knows it\
 00138 **Mar:** ja ja però:: sugar, isn't it?
 00139 **MARC:** yes\
 00140 **Mar:** yes/
 00141 **Pau:** yes\ (.) yes\
 00142 **Mar:** vale tíó\ (.) no ho sé\
 00143 **Carles:** =ahora qué hemos de hacer teóricamente/
 00144 **Pau:** es que I am an [empollón]!
 00145 **Mar:** [laughs]
 00146 **Carles:** [sɪ]\ (.) per això ha repetit (.) perquè és empollón (.) per l'actitud company!
 00147 **Mar:** ei (.) va\
 00148 **Carles:** va\
 00149 **Mar:** what are the e numbers/ venga\
 00150 **Mar:** un tros cada un diem(.) no/ tu dius the e numbers (.) the e numbers are the:: (.) aviam (.) com t'ho dic (.) the e numbers i::s (.) e::h an Europe:: (.) saps el que et vull dir/
 00151 **Carles:** explica-ho tu\
 00152 **Pau:** only Europe (.) OKEY/
 00153 **Mar:** humm::
 00154 **Pau:** =and the only number:::
 00155 **Carles:** tíó\ (.) venga\ (.) que nos van a suspender\
 00156 **Mar:** no:: no:: (.) va explícalo que tu lo has explicado bien!
 00157 **Pau:** ja\ (.) però més o menys\ (.) més o menys\ (.) the e number [are the name of]
 00158 **Mar:** =is the name (.) IS or ARE the names/
 00159 **Pau:** is the name used to the products to identify
 00160 **Carles:** =ahora!
 00161 **Pau:** to identify the products (.) and the E is only used in Europe
 00162 **Mar:** =molt bé!
 00163 **Pau:** in the rest of the world they don't use any letter\ (.) just numbers\
 00164 **Mar:** very good!

9.5. Expert's group image captures



9.6. Didactic material

Chemistry in everyday life

Expert text: 1 B



chemistry in diet

Food additives are substances added to food. They preserve **flavour** or improve the taste and appearance. Some additives have been used for centuries. For example: **preserving** sweets, using salt to preserve bacon or using sulfur dioxide to preserve wines.



Processed food was introduced in the second half of the 20th century. Many more additives of natural and artificial origin have also been introduced. This has led to **legislation** in many countries. This legislation regulates their use.



To regulate these additives, each additive is assigned a unique number named **"E number"**. This is used in Europe for all approved additives. **E numbers** are all prefixed by "E", but countries outside Europe use only the number.

There is **controversy** with the risks and benefits of **food additives**. Some artificial food additives have been linked with cancer, digestive problems, and diseases like heart disease or obesity.



Even "natural" additives may be harmful in certain quantities (table salt, for example) or because of allergic reactions in certain individuals. However, the right use of **food additives** does not have to be harmful for us since our body is composed of chemical elements as well.

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Chemistry in everyday life

Expert text: 2 B

chemistry in personal care

Personal care is the industry that produces consumer products used for beautification and in personal hygiene. **Personal care products** may include fragrances, lotions, shampoos, soaps, toothpaste, and sunscreen. Nowadays, the focus of many **environmentally concerned groups** is to decrease the amount of chemicals used in personal care products.



Cosmetics are substances used to enhance the appearance or odor of the human body. A subset of cosmetics is called **"make-up"**. This basically refers to colored products intended to alter the user's appearance.



However, **cosmetics** are not something new for us. The first archaeological evidence of cosmetics usage is found in Ancient Egypt around 4000 BC. The Ancient Greeks and Romans also used cosmetics. The Romans and Ancient Egyptians, not realizing their **dangerous properties**, used cosmetics containing mercury and white lead. These are very dangerous for the body.



Criticism of cosmetics has come from a variety of sources including feminists and animal rights activists. Many people is worried about this and prefer cosmetics that are made without any supposedly **toxic ingredients**. Even though many cosmetic products are regulated, many people still worries about the presence of harmful chemicals in these products.

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Chemistry in everyday life

Expert text: 3 B



chemistry in medicine

A **pharmaceutical drug** also referred to as **medicine**, can be defined as any chemical substance used in the medical diagnosis, treatment, or prevention of disease.



Chemistry is a huge part of medicine. Medical laboratories in hospitals analyze blood for proteins, sugars, and other substances. **Blood analyses** test the amount of potassium and sodium in our blood.

However, the presence of chemistry in medicine is nothing new. Using plants and plant substances **to treat** all kinds of diseases and medical conditions is believed to date back to **prehistoric medicine**.



The presence of chemistry is so connected to medicine that some substances have received a common name in our everyday life, while scientists refer to them according to their **scientific name**. For example, this is the case of **"Vitamin C"**, which its scientific name is **"ascorbic acid"**. Ascorbic acid is essential for the body and prevents us from getting illnesses such as **scurvy**, a very common illness among sailors in the past.



Other examples would be **"Enos salts"**, which its scientific name is **"sodium citrate"**, a very common antacid and **"Bicarbonate of soda"**, which its scientific name is **"sodium bicarbonate"**.

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Chemistry in everyday life

Name: **the quiz** (3 topics ed.)

- Choose the correct statement: (1 point)**
 - a) E numbers are only used in Europe.
 - b) E numbers are used all over the world but outside Europe they do not use the "E".
 - c) E numbers are used all over the world. They use the "E" outside Europe, too.
- Is this statement true or false? (1 point)**
"Additives from natural products can never be harmful for our body."
 TRUE FALSE
- Fill in the gaps of the text with some of the words from the box: (2 points)**
"The first archaeological evidence of cosmetics usage is found in around 4000 BC. Theand also used cosmetics."
 Ancient Egypt Spanish Ancient Italy Greeks Romans Ancient China English
- Choose the correct statement: (1 point)**
 - a) Only feminist organizations have criticised the use of toxic products in cosmetics.
 - b) Only animal rights activists have criticised the use of toxic products in cosmetics.
 - c) Both feminists and animal rights activists have criticised the use of toxic products in cosmetics.
- Match the common name of these substances to their scientific name: (1 point)**

Bicarbonate of Soda	Sodium citrate
Vitamin C	Sodium bicarbonate
Enos salts	Ascorbic acid
- Choose the correct statement: (1 point)**
 - a) Blood analyses check the amount of uranium and mercury in your blood.
 - b) Blood analyses check the amount of lithium and zinc in your blood.
 - c) Blood analyses check the amount of sodium and potassium in your blood.
- Is this statement true or false? (1 point)**
"Some artificial food additives have been linked with cancer and heart disease."
 TRUE FALSE
- Finish the following statement: (1 point)**
In order to treat all kinds of diseases, in Prehistoric medicine they used..
- Write down 5 items that are considered personal care products: (1 point)**

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Chemistry in everyday life

CHEMISTRY IN ACTION COMPETITION 

Experts group instructions

STEP 1: Find new partners

Four students sit together. They form a team. They choose an icon. Each icon represents a topic. 

STEP 2: Find new partners

Students with the same icon join in groups. 

STEP 3: Become an expert



Together read and understand your topic's text.
 Together learn the content and try to memorize as much as you can.
 Practice saying the content out loud. Ask your partner if they have any question or doubt!
 Give your text to your teacher and go back to your place.

STEP 4: Teach and learn

Students come back to their home teams 

The objective is that all of you learn the information contained in all 4 texts. You can take notes.
 Teach to your teammates all that you have learned.
 Listen and learn all that your teammates have learned.

STEP 4: The competition!

Your teacher will test you and your team to make sure that you have been working hard!

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Available at <http://grupsderecerca.uab.cat/cliisi>

9.7. Audio an video recordings

Available by request at elenah@rfid-magazine.com