

Science Project

Introduction

One of the many fascinating talks I heard during a series of seminars in San Marino during the nineties was by Prof. Gordon Wells who showed us a group of Canadian children experimenting an interactive inquiry model of learning and teaching. Essentially this consisted of getting the children interested in the topic, brainstorming to find out what they knew, having them do research on the topic and discuss it with their peers and finally - and this is what interested me the most - presenting the information to another group which then asked about or commented on their work. The final stage was reflecting on the learning process involved. In this way the children co-constructed their knowledge, guided of course by the teacher.

Obviously it would have been quite difficult, if not impossible, to duplicate a situation like this in a foreign language classroom in which my children had a background of a little over a hundred contact hours in English and no familiarity with the scientific lexis or with structures usual in science, like the passive form, which were not part of my curriculum for the year. I also asked myself whether I, as a language teacher who had never taught science, would be capable of teaching a subject matter in or through English. My previous experience in fact had concerned interdisciplinary projects in which the teachers I was collaborating with (history, art, geography, Italian) used their specific competences to carry out parts of the projects during their class time. Besides, here there was no cultural element as in my other projects.

I should say at this point that six years have passed since then (2004 was the end of my career as a teacher) and looking back and reflecting on what I did then, there are many questions that come to mind. According to Coyle (cited in *Teaching English* Bondi, Ghelfi and Toni) in the teaching framework for CLIL there are four aspects that should be part of a CLIL lesson: content, communication, cognition and culture. So if one of these components is missing, i.e. Culture, is it still CLIL or some form of it?

In regard to teaching science in English, Susan Halliwell in *Teaching English in the Primary Classroom*, speaks about the use of diagrams, charts, manual activities, verifying hypotheses, repeated patterns, drawings and so on. If this is done only partially or substituted with other activities, is it still CLIL? For example, if brainstorming isn't done, can the children's previous knowledge be assessed by, say, true/false questions? In a case where children did not investigate, make a hypothesis, verify the results and possibly change their opinion, then it would really not seem to be a "scientific" inquiry.

But on the other hand, could it be considered CLIL when children use what they have learned (the concepts) in science to transfer that information to English?

I am now going to explain how I implemented my project, the difficulties I encountered and the conclusions that I reached, in the hope of contributing to the discussion about CLIL.

"Science in English" was carried out in two fifth grade classrooms at the Scuola Elementare "Primavera" of Serravalle Republic of San Marino during the months of December 2003 and January 2004 for a total of six lessons of fifty minutes or so twice a week.

My aims for the children were:

- Cognitive
 - to consolidate previous knowledge in Science and English
 - to make a hypothesis about the meaning of the statements read aloud
 - to confirm or refute a classmate's hypothesis about the meaning of a statement
- Interactive
 - to interact with one's group and relate to the other groups and with the teacher while taking turns
- Linguistic
 - to understand a simple scientific text written in English
 - to read aloud part of the text
 - to write the correct term in correspondence to the context
- Self-evaluation
 - to evaluate one's participation and pronunciation by viewing the video
 - registration of the project

Procedure

Discussion with the subject teachers about the solar system which had been dealt with in autumn. The children had learned about the solar system and the planets, the movement of the Earth around the sun and the seasons. I translated part of their material and integrated it with other information from various sources including the internet. With me the children had worked on terminology and questions about the weather, for example, hot/cold warm/cool partly cloudy, sunny, rainy, wet....What is/was the weather like in... What was the temperature in....? They had recorded the temperature and the weather on a chart for a week and looked at maps with the forecast for some European cities and the maximum and minimum temperatures in Fahrenheit and Centigrade.

First of all the children were given a sheet about the solar system in English, asked to read it and find the answers to the true/false statements. (Enc. 1) They were also asked to list the words in the text that they knew or could understand from the context and their knowledge of what they had studied. They also had to list the words they were not able to understand at all which therefore hampered their understanding of the text. Thirdly, they were asked to explain the strategy they used to understand the text and say if it was efficacious.

To prepare them for the following reading comprehension the children were given an exercise in which they had to match a number of words in English regarding the weather and climate to their Italian counterparts. (Enc. 2)

They were then divided into four groups of five (two classes of 20 students each). Each group had a different sheet that had to be read, discussed and filled in. (Enc. 3, 4,5,6,7)

The children in each group read parts of their sheet to the other groups to see what they understood.

Subsequently three groups were given an exercise concerning the information that the first group had, either a fill-in, a true/false or a table. The group reading the exercise had already filled out theirs and had to decide whether or not their classmates understood what was read.. The groups rotated so that everyone had a chance to read his/her sentence.

From time to time, while they were working in groups, the children also filled in their “little science dictionary” with the terms they encountered.

The groups were then given the three missing sheets so that the project was complete.

During the explanation and discussion among the groups, the children were filmed so that they could evaluate their performance as to content and English (including pronunciation)

Difficulties

There is an enormous gap between what the children study and can say in Italian and in English and therefore it is necessary to simplify, whittle down to the bare essentials, what we expect them to understand and say in the foreign language. We are helped by the fact that scientific terms are quite similar to Italian and if read silently in a familiar context can be rather easily deduced. When read aloud, on the contrary, not all the children remembered the correct pronunciation of: air/hail/rain away/day/rays cycle/types weather/water among others and their voices were sometimes too low to be audible.

One sheet in particular, The Seasons, caused difficulties because of some unfamiliar lexis, both for the group reading and those listening.

The main problem for me in preparing the material was to decide the information to leave in, modify or simplify without altering or distorting what the children had already learned.

Conclusions

Whether or not this can be considered a CLIL experiment or a hybrid of some sort, I feel that on the whole it was a positive experience for the children for the following reasons: there was a lot of interest and enthusiasm about doing “science in English”. Group work with children of different abilities in English allowed everyone to contribute and being able to fall back on what they knew in science made them more willing to take chances and guess what the meaning of a sentence might be. At the beginning of the group work the children had to consult their little dictionary and/or try to deduce the meaning in order to fill in words or a table before they read the sentences to other groups. While making hypotheses was not an aim for science in this case, evaluating a classmate’s response is an important cognitive strategy, as are comparing, classifying, choosing between true and false and looking for specific information.

There was interaction among the four groups, at times individual children from one group corrected the spelling of a child from another group. Turn-taking was emphasized..

If a similar project were to be attempted again, it would be interesting to do something which Susan Halliwell calls a “sandwich approach”, that is an explanation in Italian, then a lesson or lessons in English

(not a translation but a transfer from one language to the other) and finally a coming together of both subjects and reflection on what was learned. In my case it was not possible to go any further because of the time constraints of all the teachers involved.

It was inevitable for me to focus on both languages (including reflecting on language) which I wouldn't have done if I had only been teaching English, but necessary here as confirmation that they and their classmates understood.

A more "hands on" experiment would be more "scientific" in the sense that the children could then, for example, relate a model of the solar system to day/night and year length, changes of daylight and seasonal changes in the inclination of the sun. With something concrete they could then describe and narrate a whole sequence by using connectives such as first, then, after that... There are numerous practical examples.

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