STORYTELLING AS A TOOL FOR SCIENCE TEACHING IN BILINGUAL PRIMARY EDUCATION

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ABSTRACT: This paper underlines the use of storytelling as an effective didactic resource in Primary Science Teaching in English. In order to implement this tool, it is necessary to present an overview of the current situation regarding not only the most relevant issues in Science teaching and learning, but also the way that Bilingual Education has been implemented in the last years. In addition, the concept of storytelling will be defined to reach wide enough knowledge to understand its significance. Then, a storytelling proposal will be suggested, including a sort of activities that we can put into practice and some guidelines concerning different aspects that we need to take into consideration when telling a story.

KEYWORDS: Storytelling; Science Teaching; Bilingual Education.

OBJECTIVES: The ultimate goal of the present work is to improve Primary Science teaching and learning in English by means of storytelling as a methodological resource. Other specific objectives that are expected to be achieved are: to analyse the use of storytelling in order to implement it in Science teaching in English; to enhance Science understanding; to motivate students through stories by creating a positive learning atmosphere; to promote students' creativity and critical thinking; to foster teachers and students' attitudes towards the teaching and learning process of both Science and English.

THEORETICAL FRAMEWORK

Traditionally, Science has adopted a very important role in Compulsory Education (Jiménez Aleixandre, 2016). However, due to new emerging problems related to Science Education (such as the transmition of too complex and abstract contents, the descontexualization of learning, and the teacher´s lack of confidence), it is necessary to carry out an appropriate didactic transposition, and therefore many changes in methodology. We have to encourage active engagement and meaningful learning centred in our students, foster the construction and negotiation of meaning through communication, challenge students to think critically and interact in peer-to-peer discussions, if we want to help them to gain a sense of satisfaction through learning. According to Druger (2001), the important teaching goal is not to have students just pass the exams, but to provide experiences that make a lasting impact on their lives.

On the other hand, due to the fact that the mutualism between language and Science is irrefutable (Sutton, 2003), the former one has been included in many bilingual projects in order to improve the linguistic competence as well as to foster Science learning. Thus, a suitable methodology for Primary Science teaching in a foreign language is indispensable.

Storytelling is a didactic resource used in Foreign Language Teaching to create a natural context and a positive atmosphere for learning. Through stories, different activities are carried out before, while and after telling them, promoting in this sense, the constant reception of inputs in the target language.

One of the main reasons why storytelling should be implemented in any bilingual science classroom is that stories are a big part in children's lives, they are used to them since they are born. Regardless of the form, stories are enjoyed by everyone. They have appeal because they capture our interest, imagination and creativity. Furthermore, storytelling enables us to expand beyond the overuse of textbooks and traditional methods to a creative teaching technique that equips students to respond to the 21th century needs. It appears to help students think critically and understand factual contents in a personalized fashion.

Besides linguistic abilities development, there are many other advantages- communicative, social, affective and cognitive- for using storytelling as a teaching strategy in Science or any other subject taught in Primary Education (Strauss, 2006).

Additionally, stories are a familiar and accessible form of sharing information, in other words, they can bring abstract concepts to life by giving them concrete form. Any information presented in this narrative form is easier to retain than a random list of unrelated and isolated facts. A child remembers a tale more than anything else, since events with emotions make them more memorable.

Finally, storytelling is a gentle and effective way to develop positive attitudes towards learning because it is motivating and fun. It is an attractive, economical, non-electronic form of entertainment available to most people regardless of educational level. This is the primary reason why we tell and listen to stories; we enjoy the experience.

METHOD

We have put into practice a storytelling session in two Primary Science classrooms (5th and 6th year), with 22 students each one, of a Bilingual school. As it will be shown below, the proposed educative innovation consists of three sessions; however, we just had one session to carry out this activity (see stage 'while telling the story'), and its results must be considered as a pilot study.

There are several ways of using Science stories but, in this project, we have told a story entitled "A Matter of Love" as a 'door opener' to instruction (Metz, 2007). This story is intended to make the concept being taught more memorable, to reduce the distance between teacher and students and to illuminate a particular concept, in this case, the concept of matter. Another significant function of this story is to raise questions or leave the student with needs to know more about the topic.

Guidelines for using stories well

When selecting a Science story, we should also bear in mind a number of key criteria. According to Taylor (2010), it should be age appropriate, have suitable vocabulary, clear illustrations and an engaging and appealing storyline. We also need to consider other aspects such as the language difficulty (grammar), the story length, the link to the Curriculum (appropriate contents and objectives), the cognitive load and the interactive and extension opportunities. And, above all, it is important that we make sure that we will have fun and entertainment with the story.

A storytelling session consists not only in telling a story to our students, but also in carrying out many different story-based activities in order to work on what we want to teach. According to Arnau et al. (2001), these activities can be divided into three stages:

A) Before telling the story

Teachers should previously pave the way so the students get familiar with the contents, language and concepts that the story contains. In this sense, we will introduce these aspects in the first session by using preparation activities based on pictures, Total Physical Response and vocabulary maps.

B) While telling the story

In the activities developed while the story is told (2nd session), it is important to get students involved. We can promote their participation by asking them to predict and anticipate how the story continues. But the main purpose, at this stage, is to reinforce comprehension, for example making yes-no/or-/wh-questions about the story-line.

C) After telling the story

The main characteristics of follow-up activities are consolidation, final product, integrated skills work, autonomous learning, short-term activities (role-play) or long term activities (developing a story into a play) and creativity. The follow-up activities that we will develop in the third session are: a) Check the sequence of the story through actions; b) Sum up the point of the story to make sure that the message has been conveyed; c) Research and gather information about a substance.

Materials to be used

At this point, we cannot forget to prepare attractive materials and to decorate the classroom in order to create an ideal setting for learning. Visual aids, such as students' pictures, flashcards or photographs were fundamental to follow the storyline. In addition, we could include music, sound effects and songs, which can be played every time that the represented characters appear. However, realia are the best materials we can use for telling a story to children.

Of course, the most important material to be implemented is the story itself: "A Matter of Love":

"Once upon a time there was a kingdom called 'Matter', where millions and millions of substances lived.

Matter had three countries or states: solid, liquid and gas. In the solid state all substances had a fixed size and a fixed shape. In the liquid state, all substances had a fixed size, but not a fixed shape (their shape depended on the house or container they lived). And in the gas state substances had no fixed size or fixed form (they moved freely).

In all these states, substances were classified into two different types of substances: pure substances- nobles made of one single substance- and mixtures- peasants made of more than one substance.

In the solid state, a pure substance called 'Mr. Gold' was going to get married with another pure substance called 'Mrs. Silver'. But, Mr. Gold fell in love with another substance, a pretty mixture called 'Mrs. Bronze' who was made up of copper and tin.

Mr. Gold and Mrs. Bronze had different mass (amount of substance) and different volume too (they occupied different space). But, they had in common other specific characteristics, for example, they were very strong.

One day they asked for help to the 'Crazy Scientist' because their love was impossible. Then, the scientist took Mrs. Bronze to the lab. After some days, the scientist, using a method of separation, separated Mrs. Bronze into two pure substances: 'Mr. Copper' and 'Mrs. Tin'.

So, finally Mr. Gold married Mrs. Tin and Mrs. Silver married Mr. Copper and they had beautiful mixtures together.

…and snip, snap, snout, this tale is told out!"

Evaluation

Concerning the assessment of the teaching and learning process, we can mainly gather a lot of information by observing the story effects on learning when it is implemented in the classroom, and then, registering the most relevant aspects in a diary. Besides, to guide our performance of the story and to progress, we can use a rubric including different items concerning oral presentation. For grading contents learning, we can rely in a rubric as well, but also in the students' interactive notebook and a test (see Table 1).

Table 1.
Questions used for the evaluation of contents acquisition. Source: Own elaboration

QUESTIONS	*POINTS*
Q1= What is the name of the kingdom? (Matter)	1,5
Q2= How many states can we find in matter? Name them (Solid, liquid and gas)	1,5
Q3= Answer true or false: - Solid substances have a fixed volume and a fixed shape (T) - Liquid substances don't have a fixed shape or a fixed volume (F) - Gas substances have a fixed volume, not a fixed shape (F)	3
Q4= Complete the information: Pure substances are made of (one) substance and mixtures are made of (more) than one substance. Mixtures can be separated using a (method) of (separation).	2
Q5= What is the state of these substances? (Solid, liquid, solid and gas)	2

For the analysis of the results, the following information has been calculated: the percentage of students who have passed (more than 5 points mark), the maximum, the minimum, the average and the median value, and the standard deviation of the obtained marks.

Regarding the evaluation of the educative innovation, students were required to answer whether they like the storytelling as a learning experience or not. Thus, we asked them two simple questions: (a) What did you like? (b) What did you dislike? Finally, their answers have been grouped into consistent categories to determine the percentage of frequency.

RESULTS

Storytelling is a resource that improves the teaching and learning process of Science and English in Primary Education at the same time, due to the multiple benefits it offers to our students in both subjects. On the other hand, this useful tool can be implemented in Science teaching in a bilingual context through the proposal of story-based activities. It basically gets students' better attention and understanding by means of motivation, and consequently, encourages their creativity and critical thinking through the use of stories. In this respect, a greater and greater attitude toward learning, participation and coordination among all the members of the educative community is reached.

In relation to the evaluation of contents acquisition, in the 5th year, the percentage of students who passed the test represents the 77, 27%, the maximum value is 9 (max=9), the minimum is 2,5 (min=2,5), the average is 5,25 (?=5,25), the median is 6 (M_e=6), and the standard deviation is 1,74 (σ=1,74). In the 6th year, the percentage of students who passed the test represents the 90,91%, the maximum value is 10 (max=10), the minimum is 5,5 (min=5,5), the average is 6,59 (?=6,59), the median is 6,75 (M_e=6,75), and the standard deviation is 1,76 (σ=1,76). In both classes, the percentage of students who have passed is very high, which proves an adequate acquisition of contents.

As it was expected, due to their greater level of cognitive maturity, this percentage is higher in the superior grade. The maximum and minimum values are also higher in the 6th year, as well as the average and the median value. Thus, we could remark that the teaching-learning process, in relation to contents acquisition, has been good, but better in the 6th year than in the 5th one. The degree of data dispersion is quite similar, slightly superior in the 6th year, and not excessively high, which denotes a balanced group of class.

The results about the degree of satisfaction of the students in 5th and 6th year are shown in fig.1.

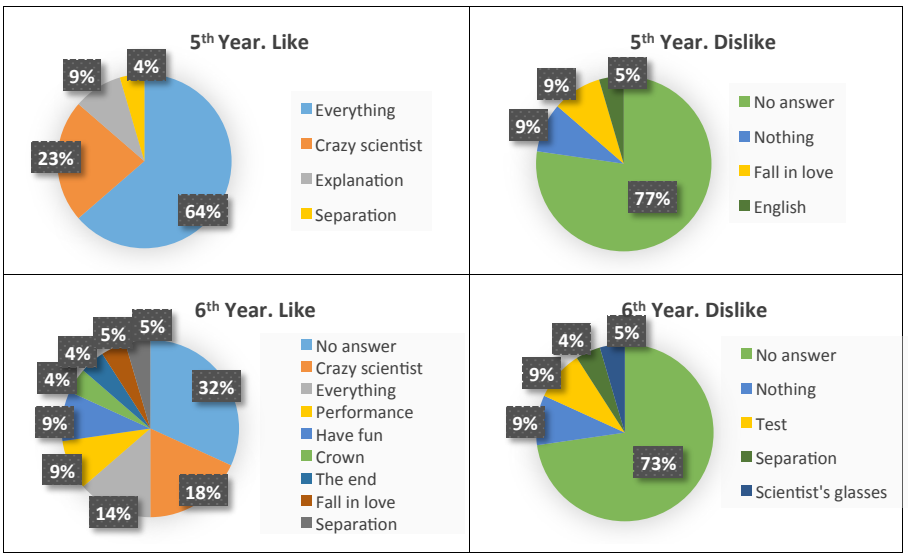

Fig.1. Students' answers to the question: What did you like? (5th year); What did you dislike? (5th year); What did you like? (6th year); What did you dislike? (6th year)

Concerning the question (a) What did you like?, some differences between the students of the 5th and the 6th year have been detected. In the 5th year, the students' answers have been grouped into four categories, which can be ordered according to its frequency as follows: everything (64%), the crazy scientist (23 %), the explanation (9%), and the separation (4%). In the 6th year, their answers have been less uniform, showing a higher number of categories and a lower quantity in frequency. Indeed, the higher percentage corresponds to the lack of answer (32%). Everything represents a 14%, compared to the 64% obtained in the 5th year, whereas the crazy scientist and the separation have a similar percentage to that of the 5th year (18% y 5%, respectively). Among the new categories of answers we have encountered: performance (9%), have fun (9%), crown (4%), the end (4%), fall in love (5%). As regards the question (b) What did you dislike?, both classes have an elevated percentage of 'no answer' (higher than 70%) or 'nothing' (9%). In the 5th year, the answer 'English' is pointed out, which makes reference to the difficulty of the language, whereas in the 6th year, students dislike the test presented at the end of the session.

CONCLUSIONS

In spite of recent technological resources, this work has tried to recover the only one that human beings have always used- and, hopefully, we will continue to do so- that is, storytelling. As it has been

stated all along this paper, we tell stories not only as an instrument of entertainment but also as an interesting and motivating way of learning.

Nowadays, students get bored in the Primary Science lesson because of its complexity. They do not understand scientific abstract terms so they get lost and, consequently, they feel frustrated. In addition, due to the current impulse of Bilingual Education, the handicap of the English language is added. Thus, we as teachers should make easier the understanding of Science in English. For doing so, storytelling seems to be perfect to communicate Science more effectively and to engage the audience since it takes into account students' needs and interests.

The results of the evaluation of the contents acquisition through storytelling are good, despite that it is a pilot study in which we completed just one of the three sessions needed for implementing this resource.

Regarding the degree of satisfaction on this proposal, more than 80% of the answers demonstrate that there is nothing opposed to the students' interests. On the contrary, in a medium-high percentage, students like this proposal. Therefore, it can be concluded that storytelling is a useful resource for the acquisition of scientific contents in English.

Although telling stories requires careful planning, it is fun for both the listeners and the teller; it is a relief of routine. In this friendly atmosphere, social and emotional abilities are developed and children are highly motivated to participate. In other words, meaningful learning is promoted.

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