



## COMICS AS A NARRATIVE IN NATURAL SCIENCE EDUCATION

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### Abstract

An important task of science education is making science more relevant to students, more easily learned and remembered, and more reflective of the actual practice of science. This work purposes a reflection on comics as a narrative in natural science education. It encourages a set of actions by the students and teachers in making comics using narratives related to scientific contents. We noticed that comics as cultural tools can be used as a vehicle through which scientific information are communicated and an important point is that elementary science teacher should be prepared to manage with the production of narratives.

**Keywords:** comics, cultural tool, narrative.

### INTRODUCTION

According to researches after some years of natural science classes' students still to have some problems to understand natural science concepts. There is a problem we have to mind about of knowing something but when you have to use it you cannot, for example students can solve problems in natural science classes but for outside of school it fail in that situation in real world. Lemke (1990) pointed out the descontextualised, dogmatic and abstract role of natural science in learning natural science:

*In teaching the content of science curriculum, and the values that often go with it, science education, sometimes unwittingly, also perpetuates a certain harmful mystique of science. That mystique tends to make science seem dogmatic, authoritarian, impersonal, and even inhuman to many students. It also portrays science as being much more difficult than it is, and scientists as being geniuses that students cannot identify with. It alienates students from science.*

Natural science education plays a very important role in broadening students' world outlook. The science classes always discuss real, concrete things and phenomena, which are a part of students' reality and even everyday life (Lamanauskas, 2003). An important task of science education is

making science more relevant to students, more easily learned and remembered, and more reflective of the actual practice of science. It is suggested that students need to develop and/or improve skills in dealing with controversial issues as they prepare to participate in a democratic society.

In contemporary democratic societies, lay citizens need to understand the nature of scientific knowledge and practice, in order to participate effectively in policy decisions, and to interpret the meaning of new scientific claims which affect their lives (Sandoval, 2005). Science educators thus seem to agree that relevant, real-life, contexts are important when teaching for scientific literacy (Mork and Jorde, 2004). Learning in context seems to role an important contribution in students understanding of natural science. Because when students are engaged in context it makes their learning more meaningful.

The aim of this work is to purpose a reflection on comics as a narrative in natural science education. It encourages a set of actions by the students and teachers in making comics using narratives related to scientific contents.

#### *Comics and Narratives*

The word "*narrative*" has its roots in Latin, the *narro* means *relate* or *tell*. In general sense, narrative may be defined as "*telling someone else that something happened*" (Herrenstein-Smith 1981, p. 228 *apud* Metz *et al.* 2007). According to Norris *et al.* (2005) the narrative describes "*the desire created in readers and listeners to know what will happen*".

These mean comics are not an illustrated version of standard literature, and while some critics argue that they are a hybrid form of art and literature, others contend comics are a new and separate art; an integrated whole of words and images where the pictures do not just depict the story, but they are part of the telling. In comics, creators transmit expression through arrangement and juxtaposition of either pictures alone, or word(s) and picture(s), to build a narrative.

Different conventions were developed around the globe, from the manhuá of China to the mangá of Japan; the comic books of the United States, and the comic magazines in Europe. It is the natural sequence of the pictures and its predominance over the words that distinguish comics from picture books, though there is some overlap between the two medias. Most comics combine words with images, often indicating speech in the format of word balloons.

Devices such as speech balloons and boxes usually indicate dialogue establishing information; while panels, layout, gutters and zip ribbons can help indicate the flow of the story. Comics are a graphic medium in which images are utilized in order to convey a sequential narrative by using

text, ambiguity, symbolism, design, iconography, literary technique, mixed media and stylistic elements of art to build a subtext of meanings.

When completely explored, words and illustrations have an enormous power to tell stories and to transmit messages. The students participate actively by using their imagination to fill out the spaces between the pictures (Rota & Izquierdo, 2003).

According to Wertsch (2001), the cultural tools can mediate the learning processes by appropriation of social and cultural elements in where they are used as a comprehension and meaning mechanism of signification. In this manner comics while cultural tool allows the comprehension of meanings and also the elaboration of others which belongs to a particular social group.

## **METHODOLOGY**

This work analyses some comics produced by elementary science teachers to understand the potential of comics as narratives into natural science education during an in-service training course.

In pairs, the teachers had to prepare a story to be organized as comics. They started the first sketches of their stories (narrative) in paper and finish it using the computer (Santana, Serra and Arroio, 2008). They were initially oriented about the software utilization, scenarios' choice, characters, balloon's insertion and external images captions to help in their stories (narrative) composition. They were as well oriented about the comics chart's language, narrative texts made outside of the balloons, characters speech, kind of balloons, charts design.

The data were collected by audio record of the teachers' speeches during these activities and it was transcript, and also the comics produced by them were analysed.

## **FINDINGS AND DISCUSSION**

According to our results we can notice that narratives can be used to support the public with some elements that provide interactive experiences for them. We believe that comics as narrative are able to communicate science issues to the public.

Most of comics produced by elementary science teachers were related to quotidian experiences about environmental issues. According to our analysis the comics can contribute as well to the development of other abilities such as coherence and cohesion – by a text construction; summarization and objective capacities by resuming a dialog in a balloon; utilization of different languages by adopting symbols, signs or images to transmit the information; development of creativity, ideas, thoughts and concepts; besides the development of the reading and writing.

In the comic strips are possible to deduce meanings and understand messages just watching, reading and interpreting images that help the story comprehension. Stories are used every day as a way of making sense of and communicating events in the world (Avraamidou and Osborne, 2008). It is fundamental that the teacher investigates what are the situations that could create interest and how it could be worked and articulated to the scientific topics, because it becomes a convincing act by showing to the students other ways to dialogue concerning reality.



Figure 1: Comics produced by elementary science teachers.

So depends on which level they are teaching, for example for the early years classes should be more important starts with comics based its narrative in images to tell the story. These young students are more sensible to the visual appeal of this tool. By the time, the students acquire high level of codification and the comics more based on texts would be more suitable for them.

In the figure 1 we can see this comic can narrate a story through a short sequence of frames quite different from books. They used the images to focus on the specificity of comics as a medium to say anything meaningful about the water consume. Here the text and images work together to create the story composed of both.

Stories have been used everyday as a medium of making sense of and also to communicate experiences in the world. According to Schank and Berman (2002), a story is a “structured, coherent retelling of an experience or a fictional account of an experience... and that in some sense, all stories can be considered didactic in nature, in that they are intended to teach or convey something to the listener”, in this case these teacher are using the comics to tell about environmental that is an emergent issue in natural science subjects for their students, the readers.

In the figure 2, we can notice an example of a comic produced also by elementary science teachers based on common sense phrases. And a narrative less complex compared to the figure 1 that present a more complex narrative. Here they used some imperative phrases like “ take a shoer

between 5 to 10 minutes”, “ don’t forget to close the tip” or “ waste in waste basket”, but based on the texts there is no a complete narrative, this one is more based on the image. And the sequence of these are not essential for the understanding of this comic.



Figure 2: Comics produced by elementary science teachers (lesse elaborated).

But they didn’t use it to promote and explain science issues to students or to general public. They try to promote some order words from comum sense. On this way this comic are not suitable to communicate science or educate the reader because this one are not able to catch the student attention and also not to convey scientific concepts in an interesting perspective. As we can notice all cartoons are independent, it means we do not have a narrative sequence. They are put on sequence but they are not related with wich other. In this case, they are illustrations with a commentary or pictures arranged in sequence. If we change the sequence, it would be the same.

If the narrative is not complete, it is not easy to students understand the story, in this way we can waste the positive aspects of comics as narratives to communicate natural science subjects. Notice in the figure 2 that this group of elementary science teacher produced one story not so much coherent and the role and effect of narrative on people’s retention on ideas was not used because the ideas on the story are not clear.

Comics can make students to think about science in different approach which these tools can introduce scientific issues in a visual entertaining way (Radoo, 2006) by the visual appeal of the images. On this way learning science could be more interesting instead of just memorizing the subjects to get suscess doing exams.

## CONCLUSION

In our study, we noticed that comics as cultural tools can be used as a vehicle through which scientific information are communicated. This approach on learning in science recognizes that an important way in which people are step by step being introduced to a scientific knowledge community by sharing a discourse in the context of relevant tasks.

But it is clear that teachers should be supported to produce their own comics according to their real needs. On this way to promote their autonomy to prepare the comics seem to be really important. Another important point is that elementary science teacher should be prepared to manage with the production of narratives, as we could see some of them had some difficulties.

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