



# THE DRAWING, EMOTIONAL REACTIONS FRONT THE WORK ACCIDENT

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## **Abstract**

In this paper the author presents the results of a research for an innovative technique for the teaching of work accidents combined story-telling, drawings and self-reflection. This technique applies the Baddeley's theory for the short-term memory and long-term memory. The implementation is presented and the results are analyzed. The proposed pedagogical goals in the beginning are reached and the author presents her recommendations for other projects want apply this technique. The author think that technique can be used in a little break in the class, when the taught topic is dense, constituting this activity a complement, where the students can learn another aspect important of the object of the matter.

**Keywords:** story-telling; responsibility; society; attention; self-reflection; real cases; work accidents; teaching; ICT; memory; drawings; educational material; scripts

## **Resumen**

*En este artículo se presentan los resultados de una investigación de una técnica innovadora de enseñanza para accidentes laborales que combina story-telling, dibujo y auto-reflexión. Esta técnica aplica la teoría de la memoria de Baddeley para memoria de corto plazo y largo plazo. Se presenta la implementación y los resultados obtenidos durante la práctica de la técnica propuesta. Los objetivos pedagógicos planteados al comenzar el proyecto fueron alcanzados. La autora presenta sus recomendaciones para aplicar ésta técnica en otros proyectos si así se desea y plantea que su propuesta puede ser aplicada como intermedios durante una clase donde la temática abordada sea densa y constituyen un momento de ruptura donde el alumno puede aprender otros temas complementarios a la materia que estudia.*

**Palabras clave:** *story-telling; responsabilidad; sociedad; atención; auto-reflexión; casos reales; accidentes laborales; TIC; memoria; dibujos; material educativo; guiones*

## 1. Introduction

The asignatures Steel Architecture and Concrete Architecture are matters of the first cycle of the undergraduate program of Architecture in the Xaverian Pontifical University. During six months the students learn the basic principles of concrete structures and steel structures to the buildings. For several semesters the technique story telling has been used where the professor teaches different aspects of construction. In this paper, is boarded the story telling and the drawings like emotional reactions of students in front of the work accidents. The author boards the short term memory and the long term memory according to Baddeley. The principal innovation of this research was the measurement of results like ethical values that the students in the short term and long term learned. These values were inquired to the students, because the professor told the story telling and only remarked one topic. With the data collected is possible conclude that different aspects were learned for the students.

## 2. Theoretical Fundaments

The tri component system of Baddeley and Hitch propose that the work memory is composed for three parts, the visuospatial agenda, the articulatory buckle and a central executive. The person prepares itself to learn looking and organizing in the space its problem or analysis object, later, it passes the articulatory buckle across sounds and phonemes the person tries to obtain an explanation in the short term with association in its memory. But only is it possible if the central executive determines is the time and prepare the brain with the attention to explain, to understand or to learn.

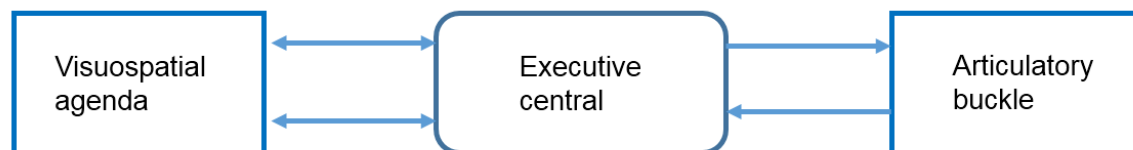


Table 1 Tri component System of Baddeley and Hitch. (Pardo – 2014)

The tetra component system of Baddeley introduces the episodic buffer, in this model previous the interaction of last central executive, the person tries to associate in your brain with previous scenes the new information and try to understand better the object of study. Later the central executive begins and operates all the functions that permit the final compression of the event. In the follow diagram it is presented the interactions of the model.



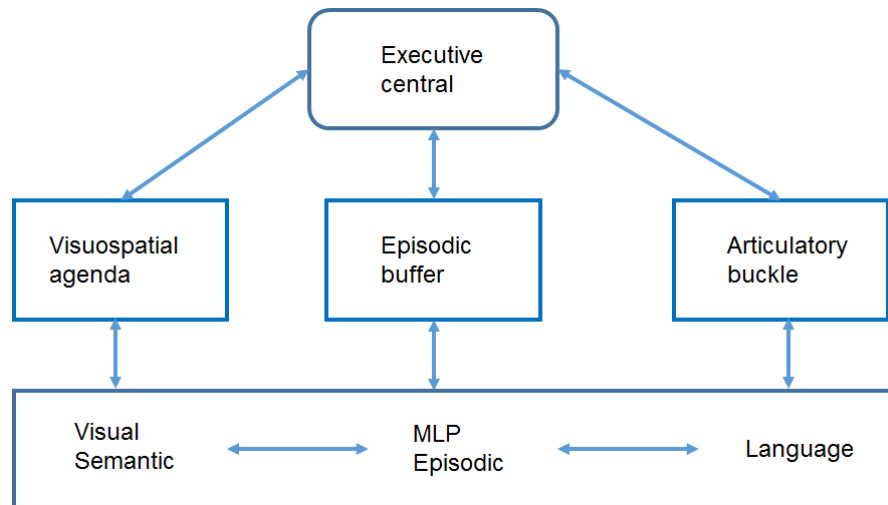


Table 2 Tetra component System of Baddeley. (Pardo – 2014)

According the study Pardo (2014), a virtual learning object has a good design if only few aspects are boarding. And it is applicable if the intention is that the concepts to learn transcend since short term memory to long term memory and the student remember always the concept. With this philosophy the virtual learning object applying the story telling and the drawings were designed for both courses. This paper presents the results obtained and are the continuation of the research of Pardo (2014).

### 3. Methodology Story-telling and graphic representations

For this study were employed two cases of work accidents. In the first, CASE 1, an engineer goes up to the construction ladder because she must review a roof, but the ladder rotates and she decided hold tight it. She fell and hit her chin. Immediately, she feels two their teeth have fallen. She is aided and the dentist orders put the two teeth in milk, while she arrives to the emergency center, where, her teeth were incrustated again. The CASE2, an engineer that all the time mistreats his work team, is in his construction, where there are several foundations with different levels. He does not like go up and go down and decides jump and jump between foundations and finally he fell and hit their ribs. In the ground with a great pain, all the work team hided because nobody wanted aid him. Finally, he must stand up himself and drive to the hospital alone. He had four broken ribs.

In both courses, while, the students learned construction processes, the professor told the story, CASE 1, in the concrete architecture and CASE 2, in the steel architecture class. A white blackboard in the virtual platform was opened and the students were free to draw, their graphic representation while they heard the story telling. In both cases, before the end of story telling, a screen capture was taken and when the students knew the end, other screen capture was taken. In the Photo 1 five relevant aspects were drawn for the students the construction ladder (1), a person without teeth (2), the teeth in the milk (3), a person crying (4), a person with the opened mouth (5).





Photo 1. Virtual blackboard before the end of storytelling. (Zulma S. Pardo V., April 2021)

At the end of the story telling, there was a self-reflection about the work accident and the students self-concluded and the professor controlled the intention of the story telling was reached. In the photo 2, the students when known the end expressed pain in front the situation, think the story is "crazy", feel strong emotions and they are commoved.



Photo 2. Virtual blackboard later the end of storytelling. (Zulma S. Pardo V., April 2021)

In the short term, the pedagogical intention is to generate the responsibility of the student in front the work accident and that they learn there are some risks that they must learn to control in the construction site. And they must control your emotions to reaction in front the accident. And to know that all the people react different like the drawings permit to conclude.



In the second CASE, the storytelling was done two weeks before the end of the semester. The same process of the CASE 1, with a white blackboard and class discussion about the self-reflection was done. Five weeks later the students were questioned about the story sense told it again. Across WhatsApp, four students were contacted and the professor required them a drawing about the lesson of this story and a short text was solicited with the individual learning. In this way the long-term memory was evaluated. The students were two men and two women. Only one participant not sent drawing. Only one participant not sent your concept in English and in this paper the author presents an adaptation of this concept.

About the received drawings, for all the participants, the engineer:

1. Always was alone.
2. received a hit in the ribs.
3. remained on the ground alone.
4. was in the construction site.
5. was in a construction with different levels between the foundations and the ground.

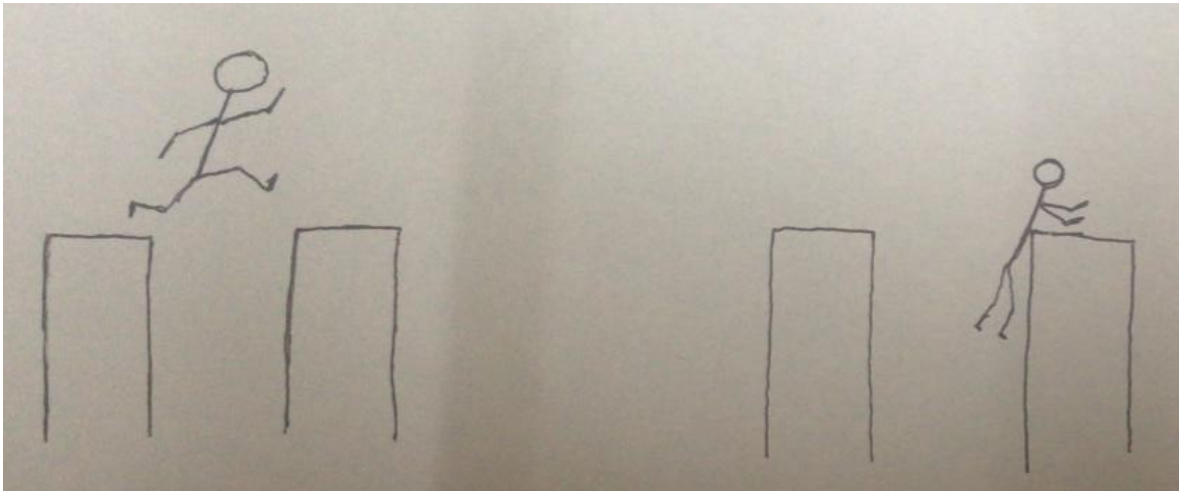


Photo 3. Drawing participant 1. (Philip Eibner, June 2021)





Photo 4. Drawing participant 2. (Daniela Ojeda, June 2021)



Photo 5. Drawing participant 3. (Andrea Palacio, June 2021)

For two participants:

There is a rupture between the engineer and the workers. One participant represents that a worker saw the accident and thought: "Why should o help?" and symbolized the relationship broken with a red line like lightning. Other participant denoted this rupture with effects in the sky and the worker continues working while the engineer remains on the ground. Additionally, the hierarchy is symbolized with the size of the body of each one and with each helmet assigned them.

About the received text, the participant 3 said:

"I learned about this story, that one has to treat good all the people. The importance of the ethical values independently of the work position and their importance in our image. About this story I help me understand because is important to good treat people, the importance the good treat and with respect. If the boss (the engineer), shall had been a good man with his workers, is possible they shall had helped him when he was the work accident, instead he was alone without help, "you reap what you sow". For this reason, it is important one put yourself in the place of another and reflection you: ¿if somebody acts with me in this way how would I feel me? ¿would like me, it?"

For the male participants, is clear the importance of safety guideline to follow. They highlight it is not correct "JUMP" in the construction site. While, the female participants highlight the treat of the workers because the engineer bad treat gave his workers, all the time. They not understand the behavior of the workers in front the work accident, but assumed the inaction in this moment of the workers were for the bad treat received for the boss. And they concluded the problem were a bad behavior since beginning, because there were not respect and good treat. For this reason, there was a rupture between the work team and to help is not an ethical value in this site. They highlight the importance of ethical values independently of the position of work.

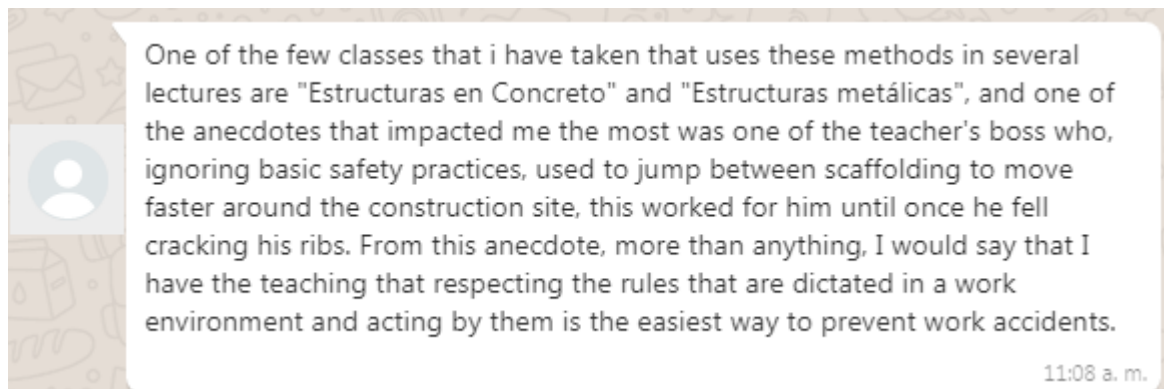


Photo 6. Text participant 1. (Philip Eibner, June 2021)



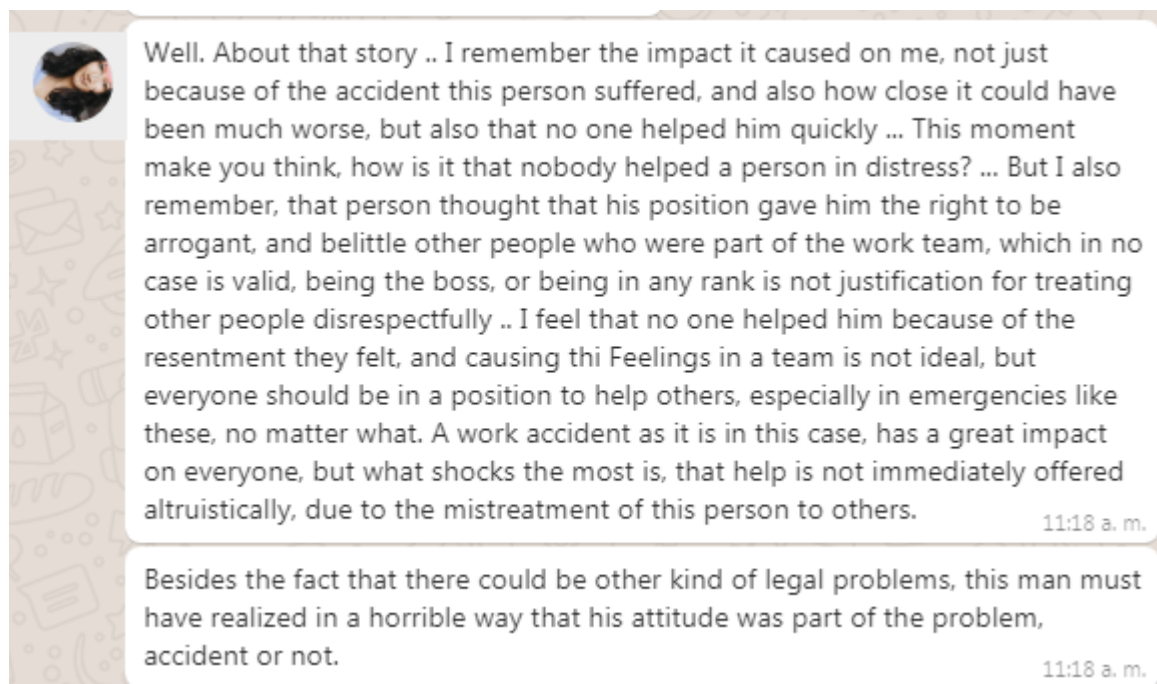


Photo 7. Text participant 2. (Daniela Ojeda, June 2021)





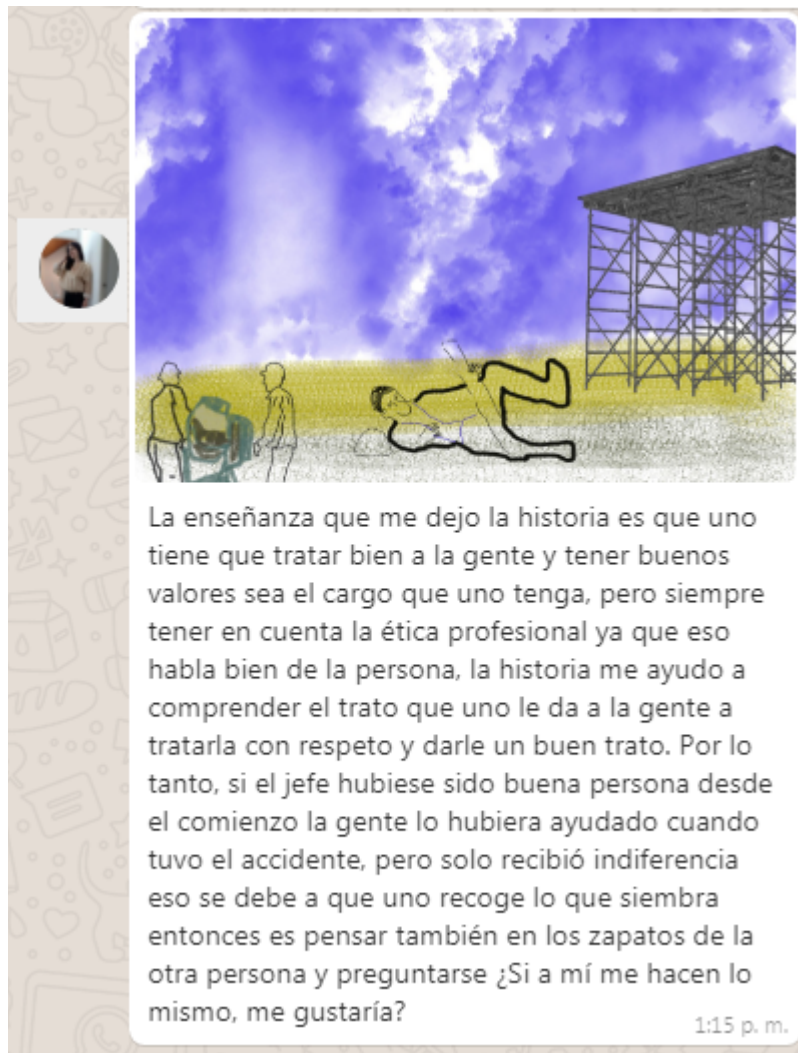


Photo 8. Text participant 3. (Andrea Palacio, June 2021)

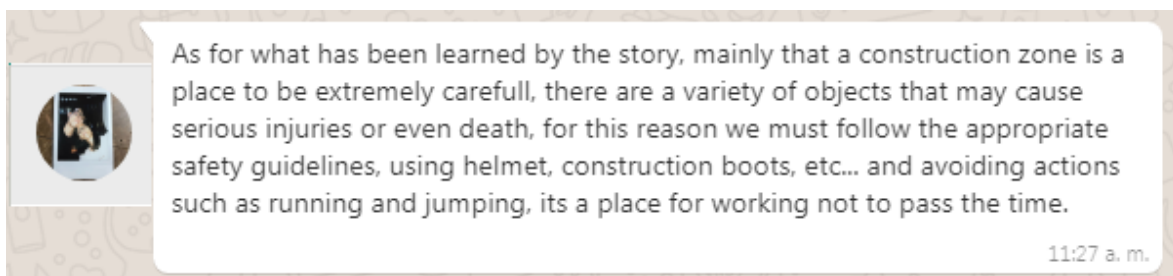


Photo 9. Text participant 4. (Julián Beltrán, June 2021)

In the long term, the pedagogical intention is to generate the responsibility of the student in front the work accident and that they learn there are some risks that they must learn to control in the construction site. In the CASE 2, there are more values to learn that in the CASE 1. In the CASE 2, are important the ethical values and your identification for the students like are the respect, the good treat, the help in the opportune moment, follow the safety guidelines in the construction site.



To apply the last test five weeks later, observing that the four students are motivated to answer the questions and to realize to drawing, was a great experience but better was observe that the proposed objectives were reached.

#### **4. Conclusions**

The theory of tetra component of Baddeley can be applied to the learning with drawings of work accidents. This technique applies the story telling in two phases how the author explains in this paper. The preparation of the script with specific pedagogical objectives is necessary. The interpretations of drawings must be done with the students, in this way the professor understand all the details and the conclusions in the end of the exercise are more realistic. It is important to do assessments where the professor can evaluate the learned concepts in the long term. The author recommends apply ICT, of easy use the students and ask concrete answer, in this case was applied one drawing and one short text by WhatsApp, and the collection of data was easy for the researcher. Similar technologies are recommended. In this study the participants in the long term, knew not who was answering, in the same time, nor the size of the sample. This technique was applied in two matters, where the component of calculations is important, activities like this represent a little break for the student, who can take more impulse for the next stage of the class and in the break learn other themes associated with the matters.

This technique can be mixed with the survey and represent an important tool of the evaluation de concepts in the short and the long term.

Finally, the author thanks the collaborations of all the students, participants in this project and specially to Philip Eibner, Daniela Ojeda, Andrea Palacio and Julián Beltrán who uninterestedly contributed with drawings and "chats" for finished this project.

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