



## An experience of the statistical learning in elementary school

Claudia Regina O. de Paiva Lima\*

Universidade Federal de Pernambuco, Recife, Brazil - [claudia@de.ufpe.br](mailto:claudia@de.ufpe.br)

Rafael Pereira Cavalcante

Universidade Federal de Pernambuco, Recife, Brazil - [rafaelpeest@gmail.com](mailto:rafaelpeest@gmail.com)

### Abstract

This study aimed to demonstrate a different didactic teaching of statistics of a primary school, so that will help teachers in the way of teaching the statistical, applying it in different areas of teaching, creative and comprehensive way for students to will develop better critical sense and an ability to interpret data.

**Keywords:** Statistics in elementary school; New teaching method; Teacher preparation.

### 1. Introduction

Currently we are bombarded by information. Every second we have new perspectives on a variety of issues that are presented to us in different ways from various equipment and tools. Based on this we see that there is a need of aid in the understanding of such information. As refers to daily affairs we can see that statistics are presented to us every time. Every day, we encounter tables, graphs, maps, etc., that is, statistics that are not always easy to understand. But the information age not only works as a coming of the channel that gives us the need to not only interpret data, but to build such information.

Therefore it is necessary to show a way for students to build and develop an understanding in statistical language. However as said Fernandes et al. (2004, p.166) citing Sousa (2002, p.78) "However, some teachers continue to think that statistic is a theme 'to which students are easily motivated and whose learning does not present great difficulties'" . How are few studies in the field of statistics of primary education, making it a new science, there are still difficulties in the way of how to present that content for students, as well as said (LOPES, 2008, p. 70) "The training of teachers currently does not incorporate a systematic work on stochastic, hindering the possibility of these professionals develop meaningful work with this theme in classrooms of basic education." In view of all this evidence the teacher Claudia RO Paiva Lima in partnership with Viviana Giampaoli teacher developed a material which presents a different didactic and that may ultimately aid in the development and statistical understanding in the classroom of primary school.

### 2. Material and Method

#### Participants

At first it was chosen one of the educational activities offered by teachers Claudia Lima and Viviana Giampaoli. The selected Activity is named "Studying Seeds". This activity aims to define the population that will be the object of study, as will be conducted sampling and classify the variables involved. With activity expected that students develop skills in observation, analysis, characterization of forms, measurement, establishing relationships, record and archive information. Encompassing areas of study such as geometry, natural sciences and biology.

The activity was applied to only one school. Consequently this research went on to deal with a case study. As time devoted to this work could not perform the experiment with a representative



sample. Therefore, the results obtained, that will be discussed below, can not be generalized to all students but for students of the classroom in which the experiment was conducted. Though this is the basis for future research involving various aspects of statistics.

23 students participated in this research, all belonging to the 6th year aged 11 to 13 years of elementary education at a school of Pernambuco state public located in the metropolitan area of Recife.

It is important to emphasize that students participated in the survey not suffer intervention before the experiment.

## Procedure

At first we tried to find in the literature a way to build an assessment tool to collect data that takes into account some of the main concepts and basics of statistics such as sample, variables, characterization of sample, size and comparison data.

The students were assessed using a questionnaire built on a contextualized activity called "studying seeds." The questionnaire consists of six (6) questions of which four (4) of them were opened, and two (2) closed with 1 (one) of them with only a statement with two (2) alternatives and the other with four (4) statements each with two alternatives. Every issue with purpose of addressing different knowledge in the field of statistics.

The activity proceeds as follows:

- 1 - the questionnaire was applied.
- 2 - Realized activity.
- 3 - The questionnaire was applied again with the intention of comparing if differences in the responses.

The activity performed (studying seeds) was carried as follows:

First was told that the learners were divided into groups of at least 4 (four) and a maximum of six (6) students. After the delivered has been a notebook with four (4) sheets, each sheet having a portion of the activity; a crayon box; a ruler; a disposable cup of coffee and a bag containing a small amount of five (5) different types of seeds. Soon after was presented the kinds of seeds also asking them to characterize, or more specifically were asked to say the color of the seeds, the species and the type of skin (smooth or rough). They were then instructed to move the bag's contents (shake the bag) to mix the seeds in order to mix the seed population (in the case of the experiment the population of each group was the bag of seeds), then were instructed that with the cup they withdraw part of the seed in with the aim to introduce them the concept of the sample. After sampling, they began the Notebook activity that was delivered. The 1st (first) sheet contained a framework where with crayons students would fill the color of the seed, the 2nd (second) sheet contained another frame where with the crayons they mark the kind of seed that had in their sample, the 3rd (third) sheet contained a framework where with the crayons they mark the type of skin that had the seeds of its sample. At the end of three (3) leaves had a small table summarizing the results obtained in the form of a frequency distribution, the 4th (fourth) and last leaf contained a picture with instructions for students with a ruler should measure all seed sample, recording the results in the table.

To analyze questionnaires before and after the activity, it was used the following scale: value 1 (one) for not responding / do not know, value two (2) to respond incorrectly, value three (3) to respond in part correct value 4 (four) answered correctly. Then calculates the difference between the responses before and after the activity.

To analyze the results we used the appropriate hypothesis test for paired data, the Wilcoxon test. This has the hypotheses:

$H_0$  : There is no effect in the treatment.

$H_1$  : The treatment had effect.

To reject the null hypothesis we used the test value (p-value) of 5%. It also has built a confidence interval for the value of the differences.

### 3. Results

In view of the difference of each question, it is observed that most of the students answer the same either before or after the proposed activity. By showing that the frequency of 0 (zero) is most on all questions, Table 01 confirms this claim.

Difference (%)	1	2	3.1	3.2	3.3	3.4	4	5	6
-3	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
-2	4,3	4,3	8,7	4,3	13,0	21,7	8,7	0,0	13,0
-1	0,0	21,7	0,0	0,0	0,0	0,0	0,0	13,0	17,4
0	91,3	52,2	91,3	82,6	73,9	78,3	91,3	73,9	56,5
1	4,3	21,7	0,0	0,0	0,0	0,0	0,0	13,0	0,0
2	0,0	0,0	0,0	13,0	13,0	0,0	0,0	0,0	4,3
3	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	8,7
Total	100	100	100	100	100	100	100	100	100

The Wilcoxon test revealed that the activity had a significant effect only in the fourth statement (3.4) of the question three (3) of the questionnaire presented to the students, but it was observed that this effect was negative (Table 2).

Question	1	2	3.1	3.2	3.3	3.4	4	5	6
P-value	0,655	0,593	0,157	0,317	1,000	0,025	0,157	1,000	0,836

The values of the lower and upper limits of the confidence interval were -0.20 and 0.02 as shown in Table 03, showing that the activity had no significant effect.

Test T	Minimum	Maximum
Value	-0,20	0,02

### 4. Conclusions

"The statistics as science goes through in a period of remarkable expansion, increasingly numerous procedures available, more and more away from the pure mathematics and becoming a 'science data', it implies the difficulty of teaching a theme in continuous change and growth." Fernandes et al. (2004, p.172).

It is concluded that the activity performed has not had a significant effect in this class. The results found, however, may have been influenced by the introduction of a lot of content in a short time. In addition, the performance can become tiring, not getting the desired result. But the motivation of the students throughout the process gives us the feeling of being in the right way. Based on this experience, in the future, it is necessary a lighter activity and a good time availability.

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