

1 **Analysis of computer science newcomers**
2 **student's motivation**

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36 1 Abstract

37 Depression and other mind diseases are currently being reported
38 at universities. Due to it, this research was proposed to observe
39 a group of newcomer students of the Federal University of
40 Uberlândia (UFU) along two semesters. Furthermore ,using
41 resources provided by BCI(Brain computer interface) technology,
42 to collect an amount of data about their emotional state.

43 Data collecting were made on 3 points of semester and each one
44 was proposed to the volunteers to do a same activity related to
45 computer science course. They executed those activities while
46 wearing a EEG based equipment, Epoc+, which was responsible
47 for collecting their emotional data.

48 The results were satisfying, students became more stressed along
49 time and their excitement decreased. Surprisingly relaxation has
50 increased, different from what was expected. The other feelings
51 had no great changes, though.

52 2 Significance Statement

53 Mental diseases such as depression, stress, anxiety and others,
54 had increased in our society nowadays. According to World
55 health organization (WHO) more than 300 million people of all
56 ages suffer from the disease, furthermore , as cited in G1
57 between 2005 and 2015 in Brazil anxiety cases increased 14,9%
58 and the country is the first one in related cases of the illness on
59 Latin America, with 5,8% of the population affected.

60 The researcher Michelle Guimarães believes that detecting
61 mental disorders can be a indicator of mental healthiness on
62 young students, also defend that those diseases reduces students
63 productiveness. Due to it, this paper intend to detect the mental
64 mood of students using Brain computer interface and appraise
65 changes along time.

3 Introduction

4 Materials and Methods

4.1 Experimental desing and statistical Analyses

5 Results

The research has shown satisfactory results. As well as expected, the students stress increased and excitement values of volunteers N1 and N2 reduced along time. The student N3 showed to be a outlier, due to it, the results will be divided by calculus counting N3 and not counting. Observing each emotion individually it's possible to realize that:

- Stress: It's one of the most important emotions on this paper and it has shown expected results. Furthermore, its values raised constantly along data collecting with a standard deviation of around 33% including student N3 and 23% without N3 values.

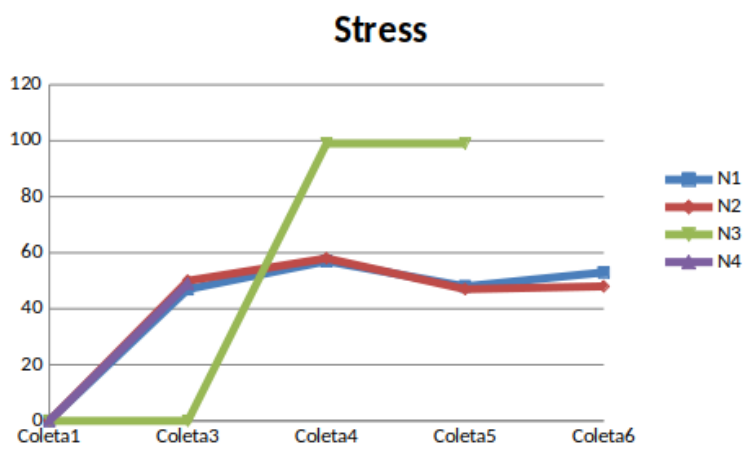


Figure 1: students stress values along data collecting

- Focus: Behavior of focus was different on each participant, it presented low variance of values from begin of the research until its end, as it is able to be concluded by standard deviation of 11%.

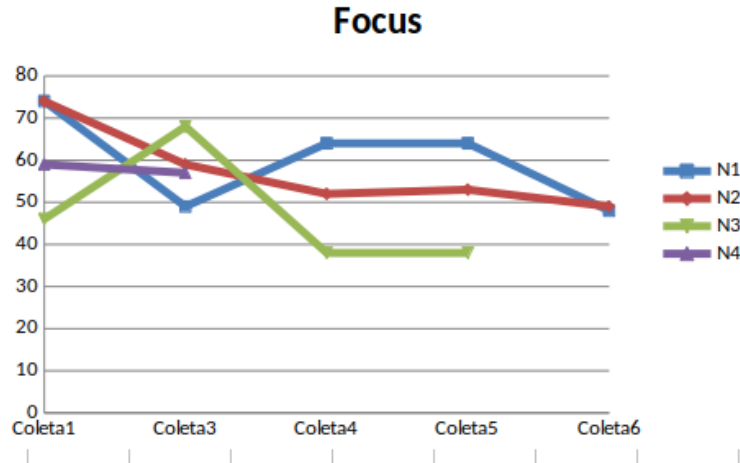


Figure 2: students focus values along data collecting

- Relaxation: Another important emotion to this paper, which has shown controversial feedback, due to its constant rise of values along data collecting. The emotion has not shown high differences of values, hence standard deviation of it was approximately 7% without student N3 and around 14% within N3.

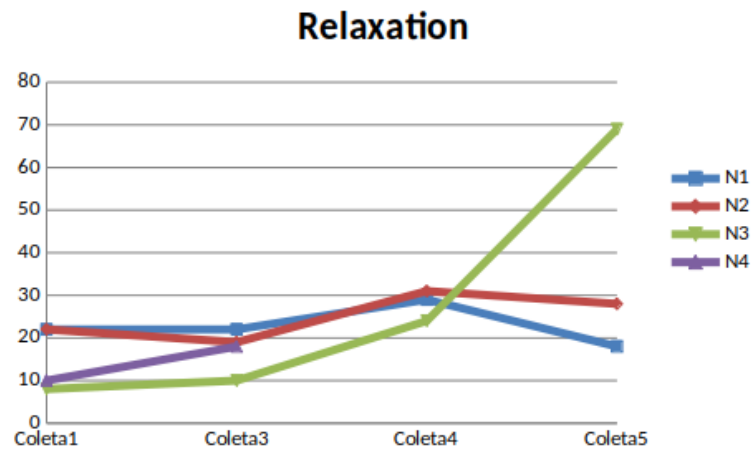


Figure 3: students relaxation values along data collecting

- Interest: Interest comportment was nearly the same though all data collects. The values of it had little variances and lower standard deviation of all emotions, under 7% even considering N3 in calculus.

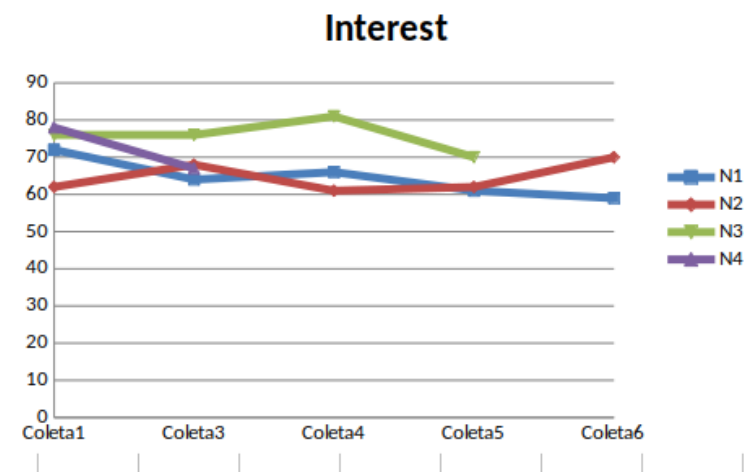


Figure 4: students interest values along data collecting

- Excitement: This feeling presented high alterations on student N3, a big increase from first data collect to last one, it has shown same lower values in mid term collects though.

98 The standard deviation values was around 14% considering
 99 participant N3 and 12% without him.

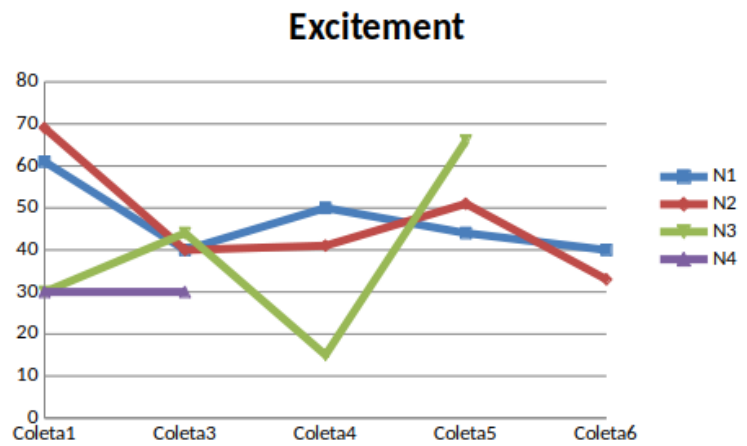


Figure 5: students excitement values along data collecting

- 100 • Engagement: Students N2 and N4 presented a high
 101 difference from collect 1 to 3, that increase was around 56%.
 102 while that, students N1 and N3 did not show significant
 103 changes in them values. The general Standard deviation
 104 was 21%, however building groups of students with N1 and
 105 N2 being first group and N2 and N4 a second, makes
 106 possible to notice that N1 and N3 had no big changes, since
 107 standard deviation of the group was 6%. It is not possible
 108 to say same of N2 and N4, because their standard deviation
 109 was around 30%.

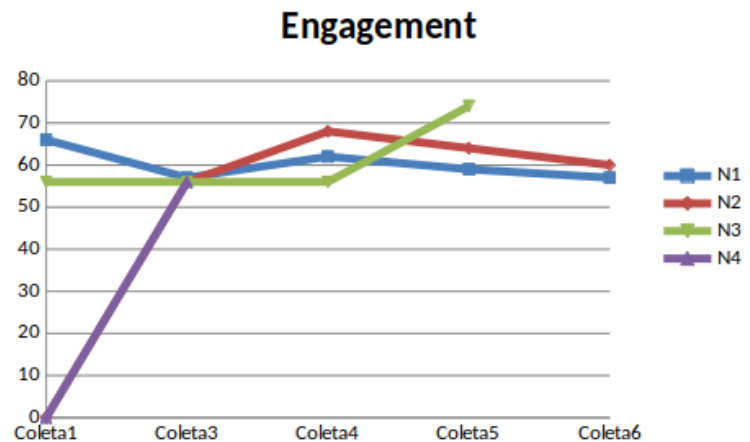


Figure 6: students engagement values along data collecting

6 Discussion

7 References

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