Emotional Intelligence and its Relationship with Academic Stress, in High School Students, An Approach to the Computational Model

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Abstract

Emotional intelligence is one of the factors that all people are exposed to, in the various activities we carry out, education is not alien, with more emphasis on students, in these times of pandemic, even more so, originating a level of stress inherent to academic activities, in this work we measure these two variables, applied to secondary school students, to know how this is the behavior of the variables under study, the results show that they present a considerable relationship, for the same effect of the online classes, a computational model is also presented where a model of how to evaluate these variables with their respective dimensions is presented, the model was carried out using the Matlab tool with neural network techniques.

Keywords

Emotional intelligence, stress, neural network, learning, training.

1. Introduction

Emotional intelligence is a much worked subject, because its level allows us to know the emotional state of people, making a review of the state of the art we find the following works:

In this research, the development of an AI model is analyzed in order to detect the emotional model of the person who is suffering cardiac arrest and calls the hospital, for which the audio recordings of dispatch communications have been analyzed. for which audio recordings were retrieved in total 337 cardiac arrest calls for the month of April 2011, the emotional states of the people have been classified according to the emotional content and the cooperation scores [1].

In this research we analyze the progress of information systems development activities about essential events for the formulation of the required system artifacts, where the developers must create software for large-scale projects, in 2 samples where this study impacts internal values, with properties of the task, population depletion where they have focused on the ability of EI, where at the beginning it showed tendencies of interaction with stress in terms of role, education, personality, EI and experience of exhaustion, then an analysis is proposed and tested on more precise mediations of

the stress level measured by the combination of EI and exhaustion, so the objective is to perform the analysis of work stress in the workers' facility using the EI moderating the relationship, this proposed method is called Regulatory Relationship through Emotional Intelligence (RREI), in terms of the Quantitative experiments demonstrated that the proposed RREI reduces burnout and promotes project management confidence of software developers, and taking into account the effect of burnout on performance increases with emotional burnout [2] [3].

In this research we analyze about Artificial Emotional Intelligence (AEI) for the analysis of service production systems, which have been conceptualized as increasingly digitized co-production environments in a network of employees, clients and technologies, therefore that we have been based on a systematic review of the literature in which the identification of 3 dimensions of AEI applications will be analyzed in order to improve the efficiency and reliability of the service, with which we can help and imitate the production capacities of clients and suppliers. [4].

In the present research we analyze about the empirical study paradigms about the cognitive model of emotional intelligence and the preliminary results obtained in it, where computational approaches will be taken with which human emotions will be modeled, the eBICA cognitive architecture , providing a framework used for the unification of cognitive and physiological emotional intelligence, dimensional and component representations of emotions, for which various types of virtual dance partners based on the eBICA model have been implemented: "shy", "ringleader "," Dancer "," naive "and intermediate cases [5].

In the present investigation we analyze about the measures of people about the rules of "human-human interaction" about artificial intelligence within CMC, which is considered important according to artificial agents, for which an experiment has been designed which was based on a personalized version of the Ultimatum Game (UG) online where it was presented and explored the role about the self-perceived reputation where the justice of people towards other people influences along with 2 types of artificial agents, artificial intelligence and the random bots, where it has been discovered about the tendency to extend the psychological dynamics of real life even towards artificial entities, thus a reputation is attributed of men and women who share alternative different opinions of 2 well-known psychological phenomena derived from the theory of self-perception and behavioral compensation [6] [7].

In the present research we analyze about emotions considered as the main element of mental health, which allows personalized affective iVR experiences which can be considered as expansion and evaluation of games, in order to promote this direction on research an experiment is carried out of playable iVR in which the user evaluates the emotion of the images through an immersive self-assessment mannequin (iSAM), where a pilot system is explored with which to allow an efficient on-line adjustment of the emotional Pleasure-Arousal-Dominance model (PAD) of a user using personalized deep learning, where the adaptation of the international affective image system (IAP) is analyzed, where the AI responds to a personalized image after learning 10 responses which are provided by the user during a session of iVR, finally the evaluation of the iVR experience is carried out through the study of 4 people nas, where our preliminary results have suggested that iSAM can successfully learn from user affect to better predict a personalized "happy" image than the static base model [8] [9].

In the present research we analyze EI considered as a man-machine dialogue system where 3 problems should be considered focus on the content level of each response, ignoring the impact of emotional factors in the dialogue of several shifts, the lack of of scalability and adaptability is that only the emotion categories specified by the users are generated in a single turn dialogue, it is difficult to capture and perceive detailed emotions and the emotional state of the speaker according to the emotional context, so it is proposed a model of emotional expression in multiturn dialogue (EmoEM) [10].

In the present work we present a model of how to be able to analyze and control the fulfillment of a work, considering as input data the values of the percentages of progress of the work, the level of the scope of the work and the budget of the work consumed Until the time of the evaluation and the estimated time for the completion of the work, resulting in the probability of completion of the work, the application prototype was developed using the Matlab tool.

2. Materials and Methods

The proposed methodology is made up of the definition of the problems that exist for emotional intelligence and academic stress, making an evaluation of both in secondary education students, each of the variables and their respective dimensions are analyzed by means of the values obtained in the measurement carried out on 100 students, with these data we propose a computational model to be able to implement it and to be able to evaluate it intelligently. Here is the block diagram of the proposal.

Figure 1: Block diagram of the proposal

3. Analysis of the problem

Implications of emotional intelligence: Emotional intelligence manifests itself in different ways in students, where its manifestations can be confused with the development of character in their respective ages, which is important to know how online study is causing changes in their mood and manifestation Of emotions, if at first it is evaluated in normal situations, in these times of pandemic these manifestations usually vary due to the fact of being without leaving home and being able to be distracted with other typical activities of their respective ages.

Implications of academic stress: Academic stress manifests itself with the mood that students present, that is why we must pay attention to these manifestations, one of the main manifestations is related to the change of character, being annoyed among others, many of these manifestations they can be related to a state of mind or emotional, hence the importance of the present study.

4. Data Analysis

The data analysis was carried out through a test where 100 students were evaluated for emotional intelligence and academic stress, where the dimensions were evaluated: emotional attention, emotional clarity and emotional repair, for the emotional intelligence variable, and the stressor

dimensions, symptoms and coping strategies for the academic stress variable, the tests were applied to secondary school students with the following results:

Emotional intelligence data analysis: Emotional intelligence presents a high average value, with 74% of the students, 20% present high levels and 6% of students present a low level, which means that of the students evaluated a strong group has good emotional health. According to figure 2.
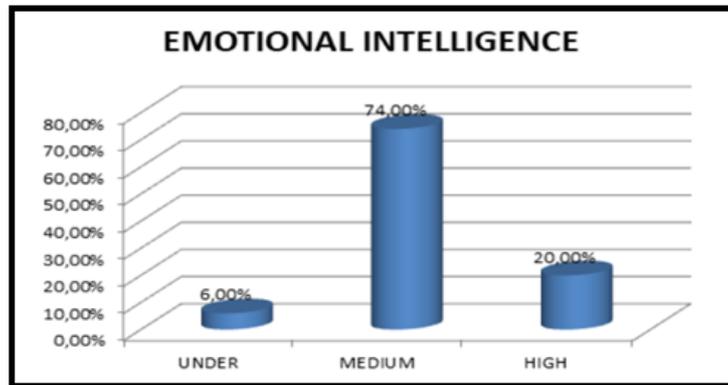
Figure 2: Values of the variable emotional intelligence
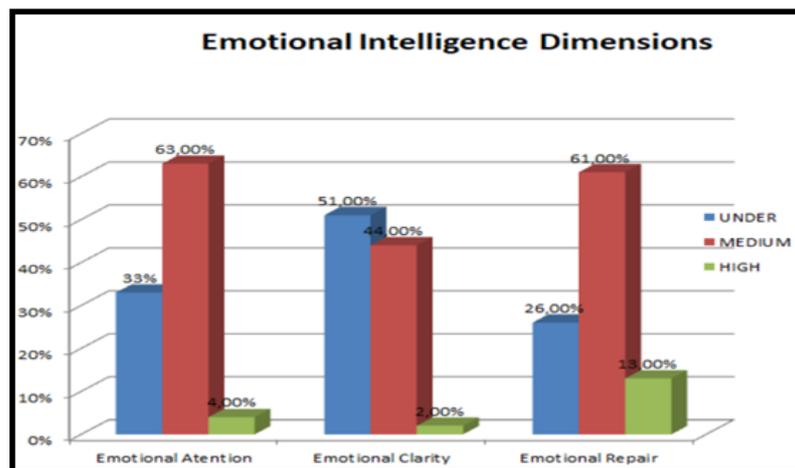
Figure 3: Dimensions of the variable emotional intelligence

The dimensions of the emotional intelligence variable present very discrete values, where for the emotional attention dimension, they present average values with 63%, high level with 33% and 4% for the low level. For the emotional charity dimension, 51% present high levels, 44% present medium levels and 2% present low levels, and for the emotional reparation dimension, 61% present medium levels, 26% present high levels and 13% present low levels. . This indicates that the students present a moderate emotional health, according to figure 3.

Academic stress data analysis: The academic stress variable presents average values of 80%, 11% high values and 9% for low values, which indicates that the evaluated students present a medium level of academic stress, according to figure 4.
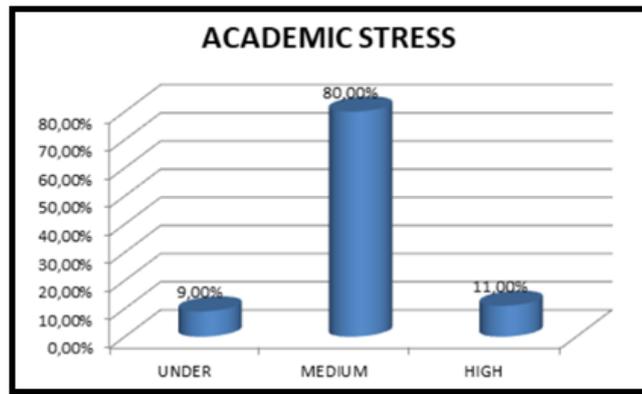
Figure 4: Values for the academic stress variable
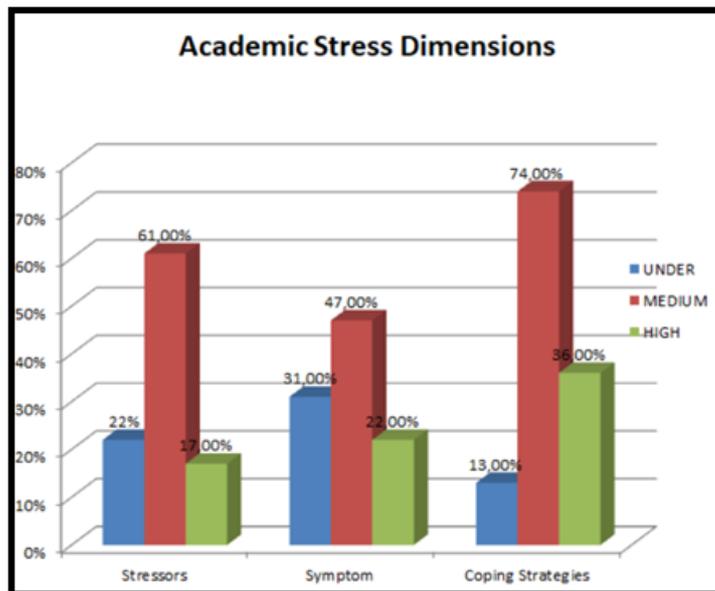
Figure 5: Academic stress variable dimensions

The dimensions of the academic stress variable are represented in figure 5, where the stressors dimension presents medium levels with 61%, 22% for the high level and 17% for a low level, for the symptoms dimension 47% for mean values, 31% for high values and 22% for low values and for the dimension of coping strategies, we have average values in 74%, for the high value 13% and for the low level 36%, which indicates that the evaluated students present average values of academic stress.

Table 1: Pearson's correlation for the two variables

<table>
<thead>
<tr><th colspan="2">Correlations</th><th>Emotional Intelligence</th><th>Academic Stress</th></tr>
</thead>
<tbody>
<tr><td rowspan="3">Emotional Intelligence</td><td>Pearson correlation</td><td>1</td><td>,033</td></tr>
<tr><td>Sig. (bilateral)</td><td></td><td>,745</td></tr>
<tr><td>N</td><td>100</td><td>100</td></tr>
<tr><td rowspan="3">Academic Stress</td><td>Pearson correlation</td><td>,033</td><td>1</td></tr>
<tr><td>Sig. (bilateral)</td><td>,745</td><td></td></tr>
<tr><td>N</td><td>100</td><td>100</td></tr>
</tbody>
</table>

Performing the correlations between the two variables that correspond to emotional intelligence and academic stress, it presents a value of 0.745 for the Pearson correlation, which indicates that there is a direct relationship, presenting average values in both cases. Demonstrating the presence of both symptoms in the evaluated students. According to table 1.

5. Organization of features

The organization of the features is described below:

Organization of characteristics of emotional intelligence

- Emotional attention
- Emotional clarity
- Emotional repair

Organizations of the characteristics of academic stress:

- Stressors
- Symptom
- Coping strategies
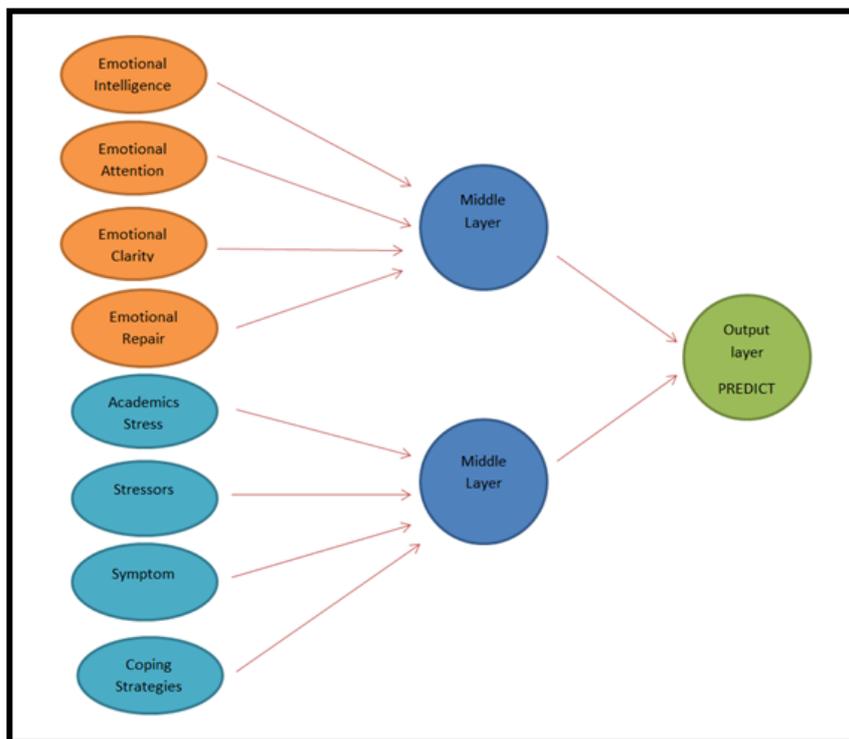
Figure 6: Neural network architecture

Predictive model architecture

The organization of the characteristics is based on the analysis of the evaluated data, for which the 2 variables with their respective dimensions were considered, with which we have 8 characteristics that will be considered as input values for each evaluation. developed the neural network model shown in figure 6, where the input layer is made up of the 8 characteristics, an intermediate layer of the model is configured and an output layer that provides us with the prediction of the relationship between the two variables, with which we can predict the relationship between the two variables without the need for a Pearson correlation.

Predictive model design

The design of the predictive model was carried out using the Matlab tool and with the architecture presented, for which, through a user interface, it is possible to interact with the application, the values of the characteristics are entered manually, for the variables emotional intelligence and academic stress, we also have intelligent processes, such as data loading, which correspond to the data of the evaluation carried out, create a network, where we create the neural network, train the network, to train the network with the loaded data, and finally the predictor, which returns the value of the correlation between both variables, to complete with the data we have the student code and the new student buttons and the button to close the application, figure 7 shows the interface developed in Matlab to check the analysis methodology between the variable emotional intelligence and academic stress.
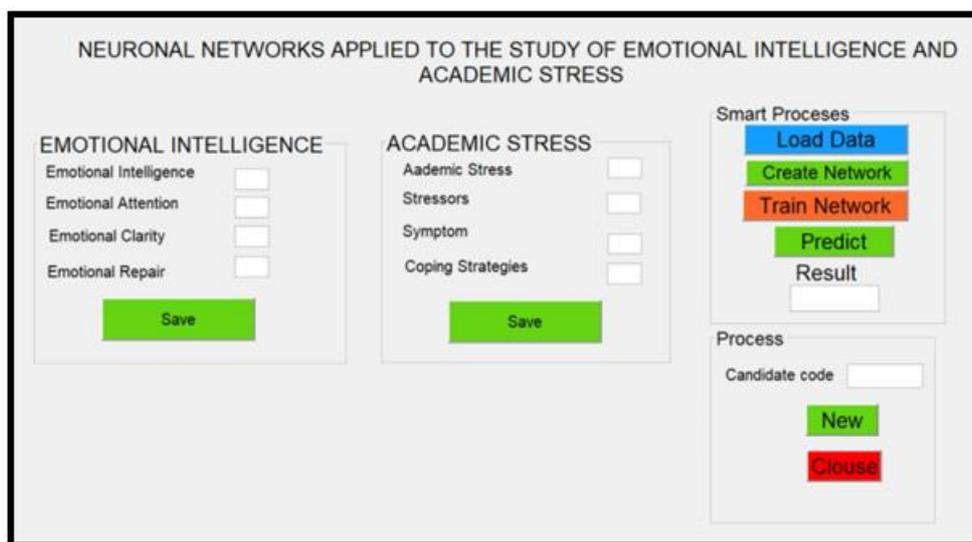
Figure 7: User interface of the developed application

6. Results

The results after completing the research are related to the fact that for the emotional intelligence variable as for the academic stress variable, it is moderately correlated, as it presents a value of 0.745 in the Pearson correlation, evidencing the presence of both in education students. secondary school, caused by online classes due to the covid 19 pandemic.

In a sample of 100 students, the presence of stress could be evidenced, which can be scaled to other groups of students, from different years and places, which shows that the study can be scaled and applied to other realities.

For a greater application and evaluation, a computational model was presented, through the use of a neural network, where it is proposed to analyze the data based on historical data, where the network analyzes similar values to be able to predict the relationship between the two, it is a way Different from evaluating, through a learning process, the network will learn according to the behavior of the input data, which are organized in the historical data and which are used to train the network.

The results of the classifier will be the value between the correlation of the variable emotional intelligence and academic stress, calculated by artificial intelligence using a neural network.

7. Conclusion

The conclusions are developed in two ways, the first is based on the results of being able to analyze emotional intelligence with academic stress, in this part we can indicate that secondary school students, no matter how much they are receiving classes at home, present a medium academic stress, as well as a medium level of emotional intelligence, which indicates that students are being affected by receiving classes at home, without going out to do other recreational activities and but not being able to interact with their classmates among other activities of their own of face-to-face education.

Based on the results obtained, a computational model is proposed to be able to evaluate the relationship between the emotional intelligence variables with academic stress through a neural network, where the values of each dimension and of its own variables are taken as inputs, the result is the relationship that exists between both cases, which shows that different data analysis methods can be used for many of the daily tasks and that they have always been evaluated with statistical techniques, in our case we resort to artificial intelligence, with Using the neural network, we were able to evaluate how these two variables behave with the same group evaluated with statistical techniques. The model can be used in other groups of students, situations and be scaled to other psychological tests.

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