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BRAKING THE STRESS CYCLE AFUZZLE LOGIC APPROACH

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Abstract

The problem of stress is recognized as one of the major factors leading to psychological and physiological problems. If persistent, stress can lead to serious health consequences such as heart diseases, diabetes, asthma and depression. In this paper, we propose a Fuzzy Based Expert System (FBES) for stress management in turn to help organizational employees, especially engineering college teachers to manage their stress for better performance. The study is primarily concerned with fuzzy logic, based on five constraints such as stress level, body condition, stress causing variables, personality type and age and suggests remedial measures to overcome the stress. After remediation, the effectiveness of the proposed system will be measured by checking the body condition again. This paper describes the Concept of stress, Statement & objectives of the study and the Research design.

Key Words: fuzzy based, expert system, stress management.

Introduction

According to Hans Selye[1], the father of stress research, the only person without stress is dead. Stress is the way that you react physically, mentally and emotionally to various conditions, changes and demands in your life. Stress is

- Anything that causes a change in your life
- Change in your daily routine
- Change in your body health

The continuum of Stress is given below in Figure1.

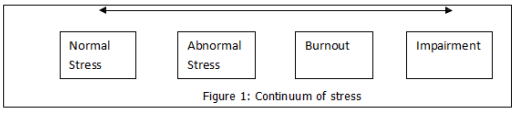

Figure 1: Continuum of stress

Many teachers experience varying levels of stress at college and their home. High levels (Burnout/Impairment) of stress can affect the physical and mental well-being and academic performance. The

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behavioral and emotional symptoms of burnout include:

- Withdrawing from responsibilities
- Isolating themselves from others
- Loss of motivation
- Sense of failure, self-doubt, feeling helpless, trapped, defeated and decreased satisfaction
- Increasingly cynical and negative outlook
- Procrastinating, taking longer to get things done
- Skipping work or coming in late and leaving early
- Using drugs, or alcohol to cope
- Taking out their frustrations on others

If the stress level goes ahead to burnout or impairment then it will definitely leads to severe physical and psychological problems. This proposed work will help the teachers to reduce their stress based on their physical condition and personality type.

Statement of the Problem

This study titled "Fuzzy Based Expert System for stress management of engineering college teachers" is primarily concerned with the development of fuzzy based expert system to suggest remedial measures for overcoming the stress which in turn will help the teachers to relieve from higher level stress.

Objectives:

The focus of this research is to propose an idea / model that in turn help engineering teachers to manage their stress for effective teaching learning process. By keeping this in view, we have formulated the following 7 objectives.

1. To identify the stress level of teachers of engineering colleges through the readjustment rating scale by Thomas Holmes and Richard Rahe
2. To measure the body condition including heart rate, blood pressure and body temperature

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3. To identify the stress causing variables by interview / questionnaire
4. To identify the personality type through Howard Gardner's Multiple Intelligence test
5. To fuzzify the expert system based on five constraints
6. To suggest remedies for overcoming the stress
7. To analyze the effectiveness of the system through post test measures

Research Design and Methodology:

Experimental research and convenient sampling was adopted for the conduct of the study. The study involves the following six steps

Identification of the stress level

The questionnaire is prepared based on social readjustment rating scale by Thomas Holmes and Richard Rahe[2]. If a teacher experienced total stress within the last twelve months 250 or greater, he/she may be OVERSTRESSED(A). If a teacher experienced total stress falls between 150 and 250, he/she may be STRESSED(B). Teacher may be CALM/RELAXED(C) at levels as low as 150.

Measure the body condition: Pre test

The five scale stress level (Highly tensed, Slightly tensed, Calm, Quietly relaxed and Deeply Relaxed) health condition of the teacher will be measured based on the following three parameters (i) heart rate, (ii) blood pressure and (iii)body temperature and the input will be fed to the expert system

Identification of variables that cause the stress

The questionnaire was administered to 150 engineering college teachers and the variables of stress have been identified and predefined. The teacher will be asked to rank three stress causing variables from the predefined list. Then the data will be fed into the expert system

Identification of personality type

The questionnaire will be developed and administered to the teachers to identify their personality/ interest through Howard Gardner's[3] Multiple Intelligence test

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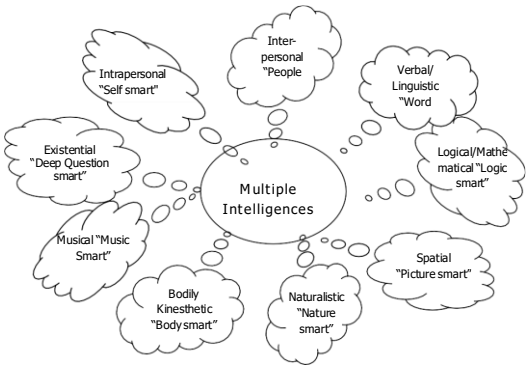

Figure 3: Howard Gardener's multiple intelliqences

The teacher will be given the test to determine their personality type and suggest the remedial measures based on the nine multiple intelligences depicted in Figure 3.

Fuzzification of the system:

In the fuzzifier, crisp inputs are transformed into linguistic values which will be joined to some linguistic variables (Zadeh[4], 1965). The syntax is given below in Figure 4

If

1. Stress level is ---
2. Stress causing variable is ----
3. Personality type is -----
4. Body condition is (nested conditions)
5. Age is -----

Then the remedial measures are -------

Figure 4: Syntax of fuzzy rule

The FBES will come out with the best feasible solution (suggesting remedial measures) to the teachers based on the five constraints listed in Figure 4

Measure the body condition: Post test

All the five constraints will be fed to the system. After getting the five inputs, the system will throw the appropriate remedial measures to be followed by the teachers. The solutions output from the expert system will be given to the teachers and instructed to follow the measures. After certain period the stress level and body condition of the teachers will again be tested for finding the effectiveness of the proposed system.

Conclusion

The proposed study identifies the teachers' stress level and determines the best solution based on five constraints. It eases the user in managing the stress without the counselor's or psychologist's help.

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