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Fuzzy logic modelling of the impact of using technology on anxiety and aggression levels of students

Konul Memmedova[a]*

Department of Psychological Counselling and Guidance, Near East University, POBOX:99138, Nicosia, North Cyprus, Mersin 10 Turkey

Abstract

Using technology such as mass media, mobile technology and the internet has positive and negative effects. In this research, the effect of using technology on aggression and anxiety levels of students was investigated using fuzzy logic approach. In order to evaluate the effect of technology use on students' aggression and anxiety levels, 100 students from the Faculty of Education of Near East University (North Cyprus) invited to participate in this study. Psychological variables were gathered using the "Technology use habits", "Effect of Social media", "Role of technology in daily life", "Educational use", "Communication use" and "Continuous - State Anxiety Inventory" Questionnaires. Application of fuzzy logic in this study allows researchers to handle the imprecision and vagueness inherence of input data and develop the more reliable model for computing input-output relations.

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Keywords: Technology; anxiety; aggression; education; fuzzification; defuzzification; inference system.

1. Introduction

Use of modern technology including the mobile phones with different applications and WIFI connections, various types of computers, gaming technology, internet technologies and so on have revealed that such technologies both have positive and negative effects on our lives (Lenhart, Madden, Hitlin, 2005).

The technological advancements positively affect the process of education and learning by making such process easier and faster, improve opportunities in reaching vocabulary, improve logical thinking, make learning possible anywhere and anytime, change pattern of life, make communication simple and comfortable, save time, promote and

* Corresponding author. Tel.: +903922236622;
E-mail address: konul.memmedova@neu.edu.tr

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enhance opportunities for carrier and online business, allow to get and share information in various aspect.

On the other hand, the technological developments have led to generation of negative effects, as well. Extended and uncontrolled use of technology inevitably cause psychological, physical and behavioural disorders that can be classified under the following categories: anxiety, depression, attention problems, aggressive behaviour, social problems, health problem, attention problems, and other many internal and external problems (Shokouhi Moqhaddam S. et al., 2013). Personal life of the youth also negatively affected as they become addicted and technology dependent, and undermine the social relationship. Among the negative effects, decrease in face –to-face communications and drastic changes in mental state and life style are observable, too.

The people experience psychological, physical and social changes mostly during the youth period. This period is affected by all positive and negative changes occurring in the social environment, affecting future generations. The aggression and violence are forms of behaviour that are observed frequently in youth today. As mentioned by Felson (1996) "The aggression is defined as any behaviour involving an intend to harm another person".

Anxiety is an emotional an unpleasant inner state often accompanied by nervous behavior. The student anxiety is "fear or nervousness about what might happen" (Merriam-Webster dictionary, 2017).

2. Research Objectives

a) The purpose of this study is to define the relationship between technology use of students and their anxiety and aggression level using a fuzzy logic approach. The Technology use is defined by following dimensions

- Habits of technology use
- Social media
- Role of technology in daily life
- Educational use
- Communication use

The conceptual structure shown of the impact of using technology on anxiety and aggression levels of students is shown in Figure 1.

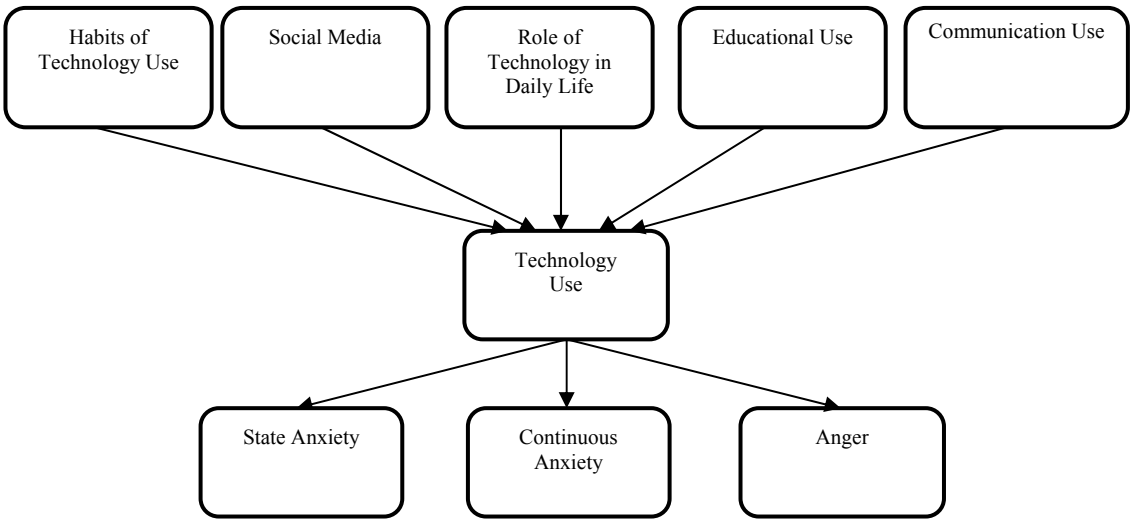

Figure 1. Conceptual structure

3. Application of Fuzzy Logic In Psychology Research

The application of fuzzy logic (Zadeh, 1965; Takagi and Sugeno, 1985; Aliev R. A., Aliev R. R., 2001) in psychology research began in mid 1982 (Smithson, M, 1982). Averkin and Tarasov (1987) examined an application of fuzzy modelling relation in psychology. Hesketh, T., Pryor, R. & Hesketh, B (1988) considered the application of

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