



Future Academy®'s Multidisciplinary Conference

EEG study of emotional intelligence among adolescents

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Abstract

Much has been studied about Emotional Intelligence (EI), and its impact on human behavior. However, psychophysiological basis of EI and its interconnection with progress in studying process is still actual. EI components reflects the ability to regulate the emotions. Ability to regulate the emotions and to be involved emotionally is effective strategy of achievements in educational process. Purpose of present research is EEG study of EI among adolescents and its interrelation with their achievements in educational process. Following methods were used: 1) TMMS questionnaire for EI; 2) EEG - electroencephalography Neuron Spectrum-1; 3) Grade Point Average (GPA) information was used as an indicator of educational achievement of the participants. As a result, present study showed that the reappraisal strategy of emotional regulation (by J. Gross, 2002), during educational task is significantly correlated with the scales of TMMS questionnaire (attention to emotion 0.185** and repair 0.237**), which reflects in left frontal gamma rhythm activation. In addition, theta rhythm well known as "emotional rhythm" has positive correlation with repair scale 0.239**. The effective emotional regulation strategy during educational process could lead the adolescents for better progress in their studies by using the emotions as major source of information. EI could be a predictor of success in perception and mastering the educational information, which supported by activity of left frontal gamma rhythm and theta rhythm oscillations.

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Peer-review under responsibility of Future Academy® Cognitive Trading

Keywords: emotional Intelligence, educational process, emotional rhythms.

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1. Introduction

The present study is devoted to emotional intelligence (EI) and its psychophysiological bases, its differences during the educational task and process of emotional regulation. The interrelation of emotional intelligence with parameters of electric activity of brain, as indicator of a functional condition, in situations of various strategy of emotional regulation during educational task is investigated.

There are variety definitions used to describe emotional intelligence, such as emotional competence, literacy, etc. (Humphrey et al 2007). However, a problem with EI is that there is no clear definition of what emotional intelligence is. Mayer et al (2004), developed model of EI comprising four abilities: (a) perceiving emotion; (b) use of emotion to facilitate thought; (c) understanding emotions; and (d) managing emotion, i.e. "to reflectively regulate emotions so as to promote emotional and intellectual growth". Nevertheless, the urgency of present research is caused first of all by relative novelty of the given concept in world psychological science and existence of sets of contradictions in the theoretical approach to given direction.

Despite popularity, greater practical importance and all the criticisms around EI concept, there has been a growing interest in the application of EI to higher education. Alan Mortiboys (2005) explores the relevance and application of EI to teaching practice in his book *Teaching with Emotional Intelligence*. He uses counselling concepts to make his case for teaching. Turner & Curran (2006) suggest that attention is facilitated by positive emotional engagement, can promote student engagement by making their sessions interesting, communicating well and allowing time for questions. This requires EI in the sense of awareness of the interpersonal and intrapersonal factors to help manage emotions.

Though there are plenty of psychological researches of emotional intelligence in the western and American literature, only a few works are studying the features of brain activity in correlation with individual differences in emotional intelligence. It is widely known, that emotional conditions and their regulation possess psychophysiological mechanisms finding their own reflection in electric activity of brain. Accordingly, individual differences in emotional intelligence as abilities to achieve better educational progress and to distinguish and supervise emotions, should find the reflection in electric activity of brain.

Methodological and theoretical basis of our research is the idea of individual ability to reflect and regulate emotions, in accordance with the emotional regulation theory of J.Gross (2002). According to this theory, the model of emotion regulation process is conceptual structure which assumes, that various forms of emotional regulation have various consequences. So, according to J. Gross (1998) there are various strategies of regulation of emotions, such as reappraisal which occur enough early in emotion-generating process and consists of change (replacement) of the way of perception of arisen situation for reduction of its emotional influence. The second, suppression, which arises later in emotion - generating process and consists of braking attributes directed outside of internal feelings.

Experimental scientific research reveals that reappraisal is often more effective than suppression. Reappraisal reduces emotional experience and behavioral expression, and has no influence on memory. On the contrary, suppression reduces behavioral expression of emotions, but can not reduce emotional experience, and bring actually harm to memory. Suppression also increases the physiological response of suppressors and their social partners.

Thus, study of emotional intelligence is the important theoretical and practical problem demanding methodological development and empirical research.

2. Purpose and Methods of the study

Purpose of present research is EEG study of EI among adolescents and it's interrelation with their achievements in educational process.

3. Research methods.

The following methods were used in present study: