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EMOTIONS IN EDUCATION – CONCEPT, MODELS, AND CORRELATES

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Abstract: The affective component of teaching is frequently underrepresented in empirical works by authors and researchers focusing on the domain of teaching and instructional efficacy. Purpose: This paper examines academic emotions as part of the affective component of teaching, primarily through a theoretical orientation grounded in Pekrun's theory of control and value. Methodology: Employing an analytical-deductive approach, scientific works thematically addressing academic emotions and their correlates were meticulously dissected. Through the analysis of numerous works addressing this issue, primary research questions concerning the relationship between academic emotions and academic achievement, motivation, cognition, and specific socio-demographic characteristics were considered. Pekrun's theory of control and value provides an integrative framework for analyzing academic emotions and their effects on learning and achievement. Results: The majority of analyzed studies confirm the effect of emotions in both intrapersonal (social judgment, perception, verbal and nonverbal expression of emotions) and interpersonal contexts (cognitive processing, metacognitive processes, strategic information processing). Gender differences were not identified in terms of experiencing academic emotions except for test anxiety, which was higher among females. The overarching conclusion is that academic emotions constitute a complex construct linked to academic success, learning, and teaching, influencing certain attitudes towards schooling.

Keywords: emotions, Pekrun's theory of control and value, academic emotions, emotion correlates.
Field: Social Sciences and Humanities

1. INTRODUCTION

Emotions represent a psychological concept that permeates various domains within numerous scientific disciplines and is widely prevalent in everyday discourse. Within the domain of emotions, academic emotions constitute a relatively recent topic that remains insufficiently explored. This review aims to delineate the concept of academic emotions, their definitions, and fundamental characteristics by scrutinizing literature and research available in English, Serbian, and Croatian languages. It further seeks to elucidate the models through which the concept of academic emotions can be explained and how the construct is operationalized. Finally, attention will be directed towards the correlates of academic emotions, exploring: 1) the association between academic emotions and academic achievement, 2) the relationship between academic emotions, motivation, and cognition, and 3) potential gender differences in experiencing specific types of academic emotions.

2. MATERIALS AND METHODS

The analytical deductive method was applied. The primary objective was to present the concept of academic emotions and its main psychological and certain socio-demographic correlates using a literature review method. Over 20 scientific papers were analyzed, focusing on academic emotions and their relationship with specific socio-demographic, motivational, and cognitive psychological aspects. All mentioned analyses were structured into several thematic sections:

- Concept, definitions, and delineation of academic emotions: Drawing upon 12 diverse sources (monographs, original scientific papers, and review articles), leading definitions and key determinants of the concept of academic emotions were presented.
- Presentation of the main theory defining academic emotions, which is the Theory of Control and Value proposed by author Perkurn. In this section, 7 sources were utilized, with the majority focusing on the original author, Perkurn.
- Illustration of the operationalization of the construct of academic emotions through the presentation of the most commonly used instruments for measuring academic emotions. This section focused primarily on the multidimensional instrument AEQ, designed for measuring academic emotions. Drawing upon 13 different sources (mostly empirical original scientific papers), the application of the mentioned instrument was analyzed, along with various versions of this instrument.

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- Correlates of academic achievement. Relationships between academic emotions and student achievement (14 original scientific papers), metacognitive processes (2 papers), locus of control (3 papers), motivation (3 papers), self-regulation (1 paper), effectiveness of online teaching (1 paper), as well as the impact of emotions on social judgment (two papers) were presented.

3. RESULTS AND FINDINGS

3.1. The concept of academic emotions

Given that education is one of the most significant domains throughout an individual's lifespan in today's society, it is possible to highlight the fact that learning and achievement in school have a strong impact on students' emotional experiences (Pekrun, 2012). Emotions are present in the school environment as part of the daily experience of students, teachers, and other individuals involved in the educational process. Attending classes, studying, and taking tests or exams are situations that elicit certain emotions. Let us recall some school situations: taking exams, answering questions, completing projects, group activities etc. In every school situation, there are emotions, whether positive or negative. We certainly were not indifferent. According to Pekrun and Stephens, emotions are central to striving for academic achievement, personality development, as well as the overall psychophysical health of teachers and students (Pekrun & Stephens, 2012).

Despite increased attention to emotions in other scientific disciplines (such as neuroscience, anthropology, and the humanities), educational psychology has neglected emotions (Pekrun & Stephens, 2012; cited in Pekrun et al., 2002). It can be argued that studies focusing on individual emotions (such as the test anxiety (Pekrun, 2006; cited in Zeidner, 1998)) or individual functions of emotions (such as their impact on cognitive processes (Pekrun, 2006; cited in Ashby, Isen & Turken, 1999)) dominate the field. The topic of academic emotions is gaining increasing recognition as emotions are no longer viewed as random phenomena present in the academic environment (Pekrun & Stephens, 2012). In recent years, researchers have increasingly turned to studying the interplay of motivation, emotions, and cognition, and there are numerous reasons for this. Modern definitions of emotions, according to which cognitive and motivational processes are central components of emotional experience (Pekrun, 2006), the growing focus on the synergistic relationship and interaction of cognition, motivation, and emotions as opposed to their individual consideration (Meyer & Turner, 2002), are some of the reasons.

The most significant contribution to the study of academic emotions has been made by Pekrun and his colleagues, who introduced the concept of academic emotions in educational psychology, defining them as emotions associated with learning and achievement, i.e., those experienced by students in school before, during, and after classes (Pekrun et al., 2002). Burić notes that academic emotions are closely related to activities and outcomes of achievement (Burić, 2008). Academic emotions refer to the emotional experience of learning and teaching, including enjoyment, hopelessness, boredom, anxiety, and anger (Lei & Cui, 2018; cited in Pekrun et al., 2002). Students experience various emotions in academic environments that influence their behavior and perception. According to Pekrun, emotions affect students' achievements, their interest, engagement, personality development, and the classroom social climate (Pekrun, 2005). Academic emotions experienced by students in school can have effects on students' cognitive processes, performance, motivation, and neuroimmune functioning (Pekrun & Stephens, 2009).

3.2. The control-value theory

The concept of academic emotions is associated with the name of Reinhard Pekrun, who has made the most significant contribution in this domain of educational psychology by developing the Control-Value theory. The Control-Value theory serves as an integrative framework for analyzing academic emotions and their effects on learning and achievement (Pekrun, Goetz & Titz, 2002; Pekrun, 2006). Within this theory, Pekrun and his collaborators merged assumptions from Weiner's attribution theory (Weiner, 1985) and Turner and Schallert's expectancy-value theory (Turner & Schallert, 2001). Focusing on achievement emotion, Pekrun defined two groups of cognitive appraisals. The first group comprises subjective control over achievement activities and outcomes, consisting of two types of cognition regarding perceived causal influence of one's actions on an activity or outcome, namely: 1) Causal expectations, referring to prospective cognition about the relationship between efforts and their future effects, e.g., the impact of effort on performance on an upcoming test; and 2) Causal attributions, referring to retrospective cognition about the causes of certain outcomes, e.g., the causes of success or failure on a test. The second group encompasses the subjective value of achievement activities and outcomes, which is formed by intrinsic value (the appreciation of learning content) and extrinsic value (the instrumental usefulness of an action or outcome for achieving other goals such as recognition from teachers or parents).

Academic emotions vary according to their orientation, activation, valence, intensity, and duration,

leading to their classification (Pekrun, 2012; Burić, 2008; Luc, 2016). Based on orientation, we can distinguish emotions related to instructional activities that occur during the learning or teaching process and emotions related to the educational outcome of learning, namely achievement emotions. According to the temporal dimension, we differentiate between prospective (anticipatory) emotions such as hope for success, fear of possible failure, as well as retrospective emotions such as enjoyment of success, pride, sadness, anger after failure. Based on activation, we distinguish activating emotions (e.g., anxiety, anger, enjoyment) and deactivating emotions (e.g., boredom, hopelessness, relaxation, satisfaction). Then, based on valence, we classify negative emotions (e.g., anger, frustration, anxiety, and sadness) and positive emotions (e.g., enjoyment, joy, and pride). If the criterion is duration, we differentiate between emotions as states (as momentary experiences in specific situations and time intervals) and emotions as traits (as recurring experiences that the student commonly undergoes during certain activities).

Academic emotions occur within three different types of school situations: participation in class, studying subjects' material, and taking exams and tests (Prgomet, 2023; cited in Burić, 2008). Pekrun identifies object focus as a significant dimension of emotions, within which we can distinguish three groups of academic emotions (Pekrun, 2006).

3.3. The operationalization of the construct of academic emotions

The operationalization of the construct of academic emotions emerged based on the multidimensional instrument AEQ (Pekrun et al., 2002; Pekrun et al., 2011), which measures various primary academic emotions, including test anxiety and other achievement emotions. The AEQ is a self-report instrument that assesses the emotions of students, including enjoyment of achievements, hope, pride, relief, anger, anxiety, shame, hopelessness, and boredom. These emotions are evaluated using separate scales for each of the three main categories of academic situations: attending classes, studying, and taking tests and exams (Pekrun et al., 2002). The AEQ (Pekrun et al., 2011) comprises 232 items: 80 items relate to emotions related to the classroom; 75 items relate to emotions related to learning; and 77 items relate to emotions related to testing.

Bieleke et al. (2021) note that the drawback of this instrument is its length, which can make testing lengthy (AEQ testing takes an average of 50 minutes (Pekrun, Goetz, & Perry, 2005)), space for questions may be limited, and there is a problem with the change in experience that the scale measures in those situations where only selected scales are applied, rather than the whole (e.g., focusing on specific emotions in a particular academic environment). As a result, there is likely a small number of researchers who use the AEQ in its full length. For these reasons, a shorter version of the instrument known as AEQ-S was developed (Bieleke et al., 2021), consisting of 96 items, which is highly suitable for empirical research where administration time is limited.

Considering the lack of empirical data on academic emotions among elementary school students, the AEQ-ES instrument was constructed, assessing three emotions (enjoyment, anxiety, and boredom) in three educational contexts (class, learning, test) (Lichtenfeld et al., 2012). Additionally, Pekrun and colleagues (Pekrun et al., 2005) developed the AEQ-M, which measures seven achievement emotions (enjoyment, pride, anger, anxiety, shame, hopelessness, and boredom) in upper grades of elementary, middle, and high schools, used in longitudinal and cross-cultural studies (Frenzel et al., 2009). Peksioto and colleagues adapted and validated the AEQ to assess emotions related to achievement in mathematics in preadolescence, known as AEQ-PA (Pexioto et al., 2015). The scale has been adapted to other cultures and languages, such as the AEQ for Filipinos (King, 2010) and for Italians (Raccanello et al., 2022). A validation and adaptation of the scale was not found in the literature in our country.

3.4. The correlates of academic emotions

The majority of studies have focused on investigating the relationship between academic emotions and students' achievement (Lei & Cui, 2016; Frenzel et al., 2009). Pekrun et al. assumed that instructional practices, parental and teacher value systems, autonomy, expectations, achievement goals, and feedback on goal attainment influence students' emotions (Pekrun et al., 2002). Emotions have an evaluative relationship with learning, teaching, and achievement. It is expected that positive-activating emotions are associated with a positive impact on learning and achievement, while negative-deactivating emotions have a negative impact. However, simple linear effects cannot be assumed. In fact, nonlinear effects are induced by: 1) different impacts of high and low intensity emotions (Sallquist et al., 2009); 2) indirect effects moderated by effort control (Dennis, Hong, & Solomon, 2010); 3) mediation by cognitive processes (Blair, 2002).

Pekrun et al.'s Control-Value theory emphasizes that subjective control over learning, achievement situations, subjective evaluation of learning and achievement are crucial for students' emotional experiences (Pekrun et al., 2002). For example, satisfaction in learning assumes that students experience their ability to master the task, have control over it, and interest in the task. On the other hand, loss of

control and concern about the adequacy of one's performance can lead to defensive and maladaptive coping strategies, such as cheating (Stuchlíková & Vaníček, 2000).

Emotions influence the learning process and in that sense have interpersonal and intrapersonal effects (Gläser-Zikuda, Stuchlíková & Janík, 2013; according to: Oatley et al., 2011). Interpersonal effects of emotions are associated with their impact on social judgment, social perception, verbal and nonverbal expression of emotions in social learning situations, and the establishment, maintenance, and termination of social relationships. Thus, humor can revitalize the classroom learning environment positively, but conversely, it can act as a distraction factor for students' learning. Intrapersonal effects of emotions relate to cognitive processing and interact with four types of cognitive processes fundamental to learning: attention, priming of concepts and knowledge structures, allocation of cognitive resources to specific information, and metacognitive processes that guide our strategic information processing (Gläser-Zikuda et al., 2013; according to: Blanchette & Richards, 2010).

Research has shown that perceived self-regulation in students is significantly positively associated with positive emotions (Gläser-Zikuda et al., 2013; according to: Boekaerts et al., 2000), while perceived external regulation is correlated with negative emotions (Pekrun et al., 2002).

Negative academic emotions such as anger in some situations can enhance learning. They influence learning strategies, lead to actual learning, and affect learning outcomes (Pekrun et al., 2014; Loderer et al., 2020). Negative academic emotions can arise due to cognitive imbalance. Research has shown that negative academic emotions can have a positive impact on learning but within certain activities and situations, for example, if students are confused when reading multimedia materials because they do not understand the content, they may not be able to resolve their confusion, leading to frustration and consequently boredom (Liu et al., 2013).

Research investigating the impact of academic emotions on various aspects of self-regulated learning and achievement has shown that emotions contribute to the prediction of learning and achievement (Burić, 2008; according to: Pekrun et al., 1996;; Pekrun et al., 2000; Titz & Perry, 2000). The results indicate a positive association between emotions of enjoyment in learning, hope, and pride with measures of student interests, motivation, and effort, while on the other hand, negative academic emotions such as boredom and helplessness are negatively associated with student interests, motivation, and effort.

Experiencing positive academic emotions is associated with more effective use of cognitive resources, metacognitive strategies, elaboration, organization, and critical thinking during learning, as well as more successful self-regulated learning (Burić, 2008; according to: Boekaerts et al. , 2000; Glaser-Zikuda et al., 2005). Negative academic emotions such as boredom, helplessness, shame, anger, and anxiety have been shown to be negatively related to motivation and engagement. Positive academic emotions foster self-regulation, while negative academic emotions promote reliance on external resources, with the possibility of reverse causality, i.e., self-regulation of learning can induce positive academic emotions, while external control can induce anger, anxiety, and boredom (Pekrun & Hoffman, 1999). Pekrun notes that the influence of negative academic emotions on student motivation and self-regulated learning is less clear. He emphasizes that in some situations, negative academic emotions can stimulate problem-solving.

Mild unpleasant emotions, in the presence of pleasant ones, can be beneficial for learning. For example, a student who wants to master a difficult task because they consider it valuable, when faced with obstacles, will interpret unpleasant emotions as a sign that they need to exert more effort to solve it, rather than as a sign that the task is too difficult. Therefore, a sense of connection with the task and positive cognition can mitigate the effects of negative emotions (Burić, 2008; according to: Boekaerts, 2007).

The results of a 2018 study (Destacamento, 2018) have shown a significant correlation between emotions and academic achievement in higher grades of high school; in other words, the more a student attends classes, studies, and takes tests/exams, the higher the student's academic success. This research has shown that there are no significant gender differences in experiencing academic emotions. However, regarding test anxiety, there are significant gender differences that favor females (Pekrun & Stephens, 2012). An important factor in experiencing positive academic emotions is the fulfillment of psychological needs. Enjoyment, as a positive academic emotion, will occur if psychological needs are met, if students are allowed to feel autonomy and competence, and if they have sincere relationships with teachers, classmates, and students from lower/higher grades (Reindl, Tulis & Dresel, 2018).

A study that examined academic emotions during online learning showed that students experience positive academic emotions (enjoyment, pride, relief) more intensely than negative ones (anger, anxiety, boredom), with enjoyment being the most pronounced positive academic emotion, and boredom as the most pronounced negative emotion. An interesting finding showed that experiencing positive and negative emotions during online learning does not significantly correlate with academic achievement

(Ranđelović & Mihajlović, 2021). Some authors have investigated the role of academic emotions in the relationship between perceived academic control and self-regulated learning within online learning and found that boredom and anxiety have significant moderating effects on self-regulated learning; in other words, good self-regulation requires perceived control and fewer negative emotions (Jiwon & Myunghee, 2014).Meta-analysis results have shown that teacher support is significantly correlated with students' academic emotions, and these relationships are moderated by culture, age, and gender. The positive association between teacher support and positive academic emotions was stronger among Western European/American students than among students from East Asia. In contrast, the negative association between teacher support and negative academic emotions was stronger among students from East Asia than among Western European students. The positive association between teacher support and positive academic emotions was strongest among college students and weakest among high school students (Lei, Cui & Chiu, 2018).An interesting finding indicates that negative academic emotions can influence school dropout. The idea of dropping out escalates in the presence of high levels of unpleasant emotions and reduced levels of pleasant (positive) emotions and decreased emotional regulation (Enguídanos et al., 2023).

4. CONCLUSIONS

Academic emotions refer to the emotional experiences students encounter in educational settings, before, during, and after instruction. They encompass the emotional dynamics of learning and teaching and are associated with achievement, interest, engagement, personal development, and classroom social climate. The control-value theory offers an integrative framework for analyzing academic emotions and their effects on learning and achievement. The operationalization of the academic emotions construct stems from a multidimensional self-assessment instrument known as the Academic Emotions Questionnaire (AEQ), which measures various primary academic emotions, as well as test anxiety and achievement emotions. Research has shown that the emergence of specific types of academic emotions is influenced by factors such as instruction, parental and teacher value systems, autonomy, expectations, achievement goals, and feedback. The impact of emotions extends to both intrapersonal (social appraisal, perception, verbal and nonverbal expression of emotions) and interpersonal dimensions (cognitive processing, metacognitive processes, strategic information processing). The occurrence of positive academic emotions is linked to perceived student self-regulation, more efficient use of cognitive resources, metacognitive strategies, elaboration, organization, and critical thinking, while perceived external regulation correlates with negative emotions. Negative academic emotions are negatively associated with motivation and engagement. However, negative academic emotions can stimulate problem-solving in situations where there is a sense of task-relatedness and positive cognition. Academic emotions are related to academic achievement, with attendance in class, studying, and test-taking contributing to it. However, there are studies where a clear correlation between academic emotions and achievement has not been found. Teacher support is crucial for the emergence of positive academic emotions. Gender differences have not been identified in experiencing academic emotions except in the case of test anxiety, which is higher in females.

Based on the findings from previous research, it can be concluded that academic emotions constitute a complex construct that is associated with academic achievement, learning, and teaching, and they influence certain attitudes towards school.

Limitations: This study aimed to define the construct of academic emotions as closely as possible; however, a major limitation could be the fact that the literature was searched in languages known to the author (English, Serbian, Croatian, Bosnian, Czech). It raises the question of whether research conducted worldwide has yielded similar or different results.

It would be interesting to investigate the existence of cultural differences regarding academic emotions.

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