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High School and University Students' Self-regulated Efficiency and Emotions

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Abstract

In this study, the authors explore the effect of students' self-regulated efficiency component on their positive and negative emotions regarding school and school learning. The findings show that challenge and productive learning predetermine 44% of the variance in positive feelings, while autonomy, interactive or cooperative learning as well as independent decision making are variables that are rejected in multiple regression as predictors of positive emotions. When negative emotions are introduced as mediators via a hierarchy regression model, it would appear that their reduction effect on the predictors of positive emotions is trifle, as they do not change the established relations significantly. Likewise, a model in which multiple regressions were used to test the negative components of self-regulation efficiency on negative emotions displayed similar results. Aversion, reproductive learning and execution of teachers' decisions predetermine negative emotions, but they explain only 10% of the variance, whereby positive emotions, as a mediation variable, do not change the model.

Key words: *challenge; negative emotions; positive emotions; productive learning; self-regulated efficiency*

Introduction

The emotional foundation of school learning has not been thoroughly researched yet. Undoubtedly, it represents a challenge for students. However, that challenge can be positive or negative. While some students face learning challenges in order not to disappoint their parents or to meet the expectations of the society, others meet the same challenges with the satisfaction of acquiring knowledge – hence they enjoy learning as such. Some students do it to avoid fear while others do it for pleasure. If we take Stanley Greenspan's thesis about emotions being the generators of our cognition

(Greenspan, & Benderly, 1997) and if we know we are dealing with positive emotions, we face the question about the relationship between positive and negative emotions in school learning, as well as their interrelation with challenge and other components of students' self-efficiency. This research specifically deals with the interrelationship between self-regulated efficiency and positive and negative emotions in young people.

What is self-regulated efficiency? It primarily refers to students' confidence in their independent meeting with challenges and obligations, and dealing with obstacles they come across. First of all, we focus on self-regulation in the field of academic achievement. "Self-regulatory efficacy also implies above all academic goals and aspirations, personal standards for the quality of work considered acceptable, and beliefs in one's capabilities for academic achievement after reaching a particular instructional level and implies prior academic performance and relevant aptitude" (Caprara et al., 2008, p. 526). The research shows that positive emotions are at the foundation of self-regulation (Pekrun, Goetz, Titz, & Perry, 2002). The subject of this research, which is the correlation between self-regulated efficiency and students' emotions, also includes negative emotions because we are interested in their effect on the components of the self-regulation of students in learning.

Self-regulated efficiency as a term is a category of *the social cognitive theory* (Bandura, 1986; Zimmerman, & Cleary, 2006). This theory deals with the way in which people use their cognition to regulate and direct their behaviour and values. In the future, we may expect an increase in the importance of self-regulation in academic achievements because we live in a learning society in which the ability to learn fast and use information represents a condition of freedom and happiness of all civilians, regardless of age. Bandura (2002) states that at the beginning of the 21st century, the rapid development of information and technology requires development of cognitive competences. To effectively regulate their learning, their cognitive, emotional and behavioural actions, people need to learn how to learn and how to love learning. In this research we test the correlation between high school and university students' emotions and self-regulated efficiency.

Self-regulated Efficiency

The first logical question we can ask about self-regulated academic efficiency is whether schools support students' self-regulated efficiency or suppress it in any way. There are no research data to provide us with a quality scientific proof of that, but the educational practice shows that schools in the past implemented reproductive learning based on memory and reproduction which directly collided with students' self-regulated efficiency. In the future, we can expect schools to introduce methods and techniques of personal control over students' learning. For self-regulation to function, it is necessary to fulfil three conditions: 1) self monitoring, 2) relating personal goals to the values and value orientations in order for the motivation of self-determination to function, and 3) enabling social support for the implementation of academic goals

(Caprara et al., 2008, p. 525). According to the social cognitive theory, self-regulation implies a relation between cognitive and meta-cognitive mechanisms of self-estimation, which means that it implies the individuals' competence to independently evaluate their own advantages and weaknesses and take appropriate actions with the goal to compensate the weaknesses and develop their own advantages whilst dealing with challenges, productive learning, decision making and other components of self-regulation.

We are particularly interested in self-regulated learning because this research primarily deals with academic self-regulation. In general, self-regulated learning is defined as generating cognition, emotions, and actions that are oriented towards completing academic assignments (Schunk, & Zimmerman, 1994). The authors list different components of self-regulated learning. Such classification implies: 1) the use of cognitive strategies in processing, learning and understanding the matter – elaboration, organization and critical thinking, 2) meta-cognitive strategies that enable cognitive monitoring and supervision of independent learning – the use of time and resources, control over anxiety and alike, 3) determination of will to persist in reaching a goal which implies the capacity of a pupil in persistence – regulation of effort, reduction of hesitation (Vansteenkiste et al., 2009, p. 674). A similar classification of components can be found in “The Scale of Self-regulated Learning” constructed by Bandura (1990) and calibrated later on an Italian sample (Bandura et al., 1996). It contains the following components: 1) organization of individual school activities and assignments, 2) control over distractions, 3) preparation of learning conditions, and 4) self-motivation. We are particularly interested in the components of students' self-regulated efficiency because we wish to find out which one of them most significantly predetermines emotions in school learning as emotions stand at the foundation of the cognition efficiency.

Following the trail of knowledge through research and contemporary literature, we can point out five key components of students' self-regulated efficiency: 1) challenge against aversion, 2) autonomy against addiction, 3) productive against reproductive learning, 4) interaction and cooperative learning against individualism and uncooperativeness, and 5) independent decision making against submissiveness. These five subtests are measured by the instrument constructed for this particular research, i.e. *SRE – Students' Self-regulated Efficiency*.

Students' Emotions

Positive emotions are generators of one's cognition, and we find the grounds of this thesis in the physiology of our nervous system. It is well known that positive emotions stimulate the extraction of serotonin, the pleasure hormone, whilst negative emotions stimulate the extraction of cortisol, the stress hormone. What our organism experiences as pleasure stays in its memory longer because serotonin facilitates a substance exchange and improves the function of numerous organs in the human

body. That has direct implications on the learning efficiency. An example of this would be the tragic loss of a close one. A person affected by such loss does not sleep well for days, months or even years. They often cannot eat and they grieve, sometimes unable to even talk about the deceased. After a certain period of time, which can even be years, those affected by bereavement start to function normally again because their nervous system manages to suppress negative emotions and they succeed to cope with the loss. Therefore, negative emotions are suppressed by the nervous system. What about positive experiences? A person brings back such memories with pleasure because they facilitate the extraction of serotonin, the pleasure hormone. What we are trying to measure in this research is the extent to which schools induce both positive and negative emotions in their students. Apart from that, we are also measuring if positive and negative emotions have their own predictors in students' self-regulated efficiency.

The findings show that positive emotions contribute to problem solving, protect health, incite relationships, stand as the base of self-regulated efficiency and regulate group interactions (Pekrun, Goetz, Titz, & Perry, 2002). Other research studies also prove that positive emotions represent the foundation for efficient learning. The findings show e.g. that such emotions increase learning motivation, strengthen self-regulation effort, activate cognitive resources and help reach objectives (Ashby, Isen, & Turken, 1999; Pekrun, 2006). Considered as components of school achievements, emotions are not to be categorized as only positive or negative since they are often found to be ambivalent, i.e. both positive and negative. The research proves that students describe school as both pleasant and unpleasant at the same time and that it provokes both fear and joy in them (Suzić, 2009). This research encompasses those contradicted emotions.

Teachers' negative emotions demonstrated in classrooms such as anxiety, tension or anger directly lower the level of students' motivation and generate children's negative emotions (Frenzel et al., 2009). Another research points out the fact that negative emotions distract them or interrupt their attention, while positive emotions increase them (Chao, 2010). Fear of failure and concerns about bad social reputation result in anxiety and fear for one's own performance objectives (Suzić, 2002). It is of great relevance to find answers to the question about the relationship between negative emotions and performance efficiency, or whether negative emotions decrease the level of challenge and other components of students' performance efficiency. This research provides us with an answer to that specific question. Also, we wish to find out whether predilection for positive emotions changes under the influence of performance efficiency when negative emotions are introduced into the model of hierarchical regression.

Research

Hypothesis

This research is based on the hypothesis that self-regulated efficiency predetermines positive and negative emotions about school and in school learning and that within

self-regulated efficiency we can identify the key predictors of high school and university students' positive and negative emotions.

If, during the research, we discover that there is a dominant component which predetermines students' self-regulated efficiency, we will accomplish two pedagogical benefits. First, we will find out what works best for students, what is in the base of the latent background of their positive and negative emotions, and second, we will discover which components of self-regulation have, so far, been excluded. Based on these findings, we will conclude which measures need to be taken in order to activate those suppressed emotional components.

Research Methodology

The participants are provided with answer sheets. After the examiner reads a question from a test, all the participants circle their answers on the Likert scale. If there are any unclear questions, participants signal to the examiner by raising their hands and asking for an additional explanation. This way, we achieve continuity and clarity of the research. It is brought to the participants' attention that discretion is guaranteed and the data related to their answers will be used for scientific purposes only and the access to that data will not be granted to their teachers. The data obtained were processed using the program SPSS 15 Statistics for Windows. The research was completed in June 2010.

Sample

The sample includes 366 high school students and 535 university students (Table 1). The Chi-square test shows that the sample is not equalized ($\chi^2 = 31.69$; statistically significant at the level of .001) according to the high school versus university students criterion, but the size of both sub-samples suffices to make certain generalizations. The sample involves participants from the town of Banja Luka only.

Table 1. Sample structure and size

| School Study programme | High school students Year | | | | University students Year | | | | Total |
|---------------------------|------------------------------|----|-----|----|-----------------------------|----|-----|----|-------|
| | I | I | III | IV | I | I | III | V | |
| Grammar school | 6 | 8 | 23 | 7 | | | | | 94 |
| Catering | 4 | 3 | 18 | 0 | | | | | 85 |
| Construction | 8 | 4 | 16 | 9 | | | | | 87 |
| Economy | 5 | 8 | 29 | 8 | | | | | 100 |
| Psychology | | | | | 2 | 40 | 19 | | 101 |
| Pedagogy | | | | | 8 | 25 | 30 | 37 | 140 |
| Preschool education | | | | | 4 | 0 | 4 | | 108 |
| Class lectures | | | | | 0 | 48 | 78 | | 186 |
| Total: | 03 | 03 | 86 | 4 | 94 | 53 | 151 | 37 | 901 |

The consistency of the sample is also tested by gender as it includes 183 male and 718 female participants. $\chi^2 = 317.68$ (significant at the level of .001), which shows that

the sample is not consistent according to this criterion and does not suffice to make generalizations. For this reason, we will not derive any statistical data from variables based on participants' gender.

Instruments

Two instruments are used in this research: 1) SRE – Students' Self-regulated Efficiency and 2) PANAS – Positive and Negative Affect Schedule¹ (Watson, Tellegen, & Clark, 1998). Both instruments are further described in detail.

SRE – Students' self-regulated efficiency is our personally created instrument which contains 94 items divided into ten sub-tests. The inner consistency of the whole instrument measured by Cronbach's alpha test shows the result of $\alpha = .82$. All the items in the sub-tests are provided with their own opposite versions. All the sub-tests are named after the subjects they measure. The first two sub-tests are *Challenge* ($\alpha = .79$) with 10 items and *Aversion* ($\alpha = .87$) with 10 items, followed by *Autonomy* ($\alpha = .57$) with 9 items and *Addiction* ($\alpha = .62$) with 9 items. The next two sub-tests are *Productive learning* ($\alpha = .65$) with 9 items versus *Reproductive learning* ($\alpha = .66$) with 9 items, followed by *Interaction and cooperative learning* ($\alpha = .56$) with 9 items versus *Uncooperative and submissive learning* ($\alpha = .60$) with 9 items. The last two sub-tests look into decision making and they are *Self-guided decision making* ($\alpha = .69$) with 10 items versus *Execution of teachers' decisions* ($\alpha = .63$) with 10 items. All the questions are answered using a Likert type scale from 1 = *I strongly disagree* to 5 = *I strongly agree*. The opposed items of this instrument make it possible to calculate the consistency ratio of the participants' answers.

PANAS – Positive and Negative Affect Schedule (Watson, Tellegen, & Clark, 1998) consists of 20 items out of which 10 measure positive ($\alpha = .87$) and other 10 measure negative ($\alpha = .87$) Students' emotions during classes and exams. All the questions are answered using a Likert type scale from 1 = *I strongly disagree* to 5 = *I strongly agree*. It needs to be emphasized that the items in the PANAS scale are not set as opposite, which is the case with the SRE instrument. This does not ascertain the calculation of the consistency ratio of the participants' answers.

Results

We hypothesized that self-regulated efficiency significantly predetermines high school and university students' positive and negative emotions about school achievement and that within self-regulated efficiency we can identify key components of such a tendency. To prove this hypothesis we constructed models 1 and 2 (Figure 1 and 2) which are to be tested via multiple and hierarchical regression analyses.

¹ The instrument is used with the author's permission.

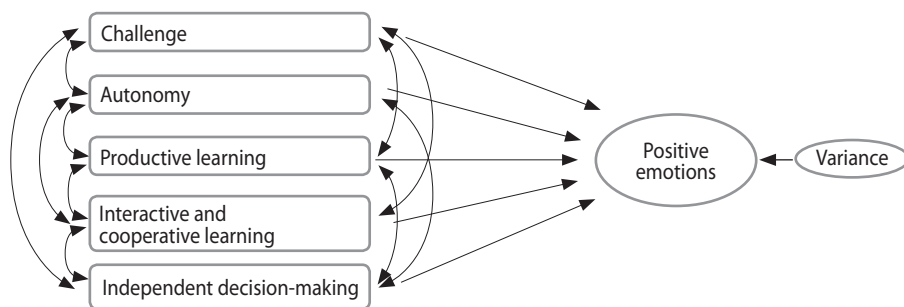


Figure 1. Predictors of positive emotions in school learning (Model 1)

The multiple regression allows us to derive beta coefficients that show which of the 'independent' or predictor variables determine the dependent variable most (Suzić, 2007). In Model 1, we are interested in finding out which self-regulated efficiency component primarily predetermines students' positive emotions about school learning, while in Model 2, we test the predictors of negative emotions.

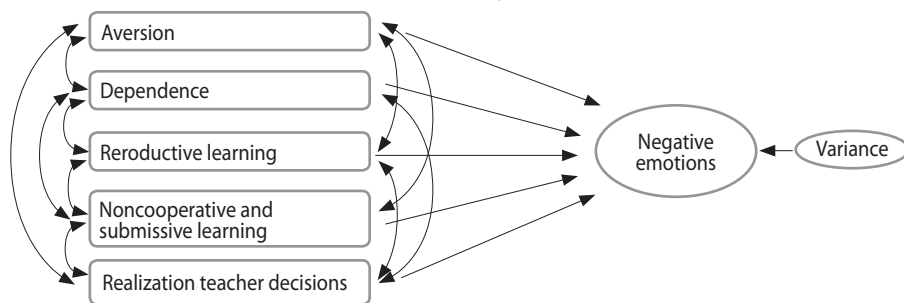


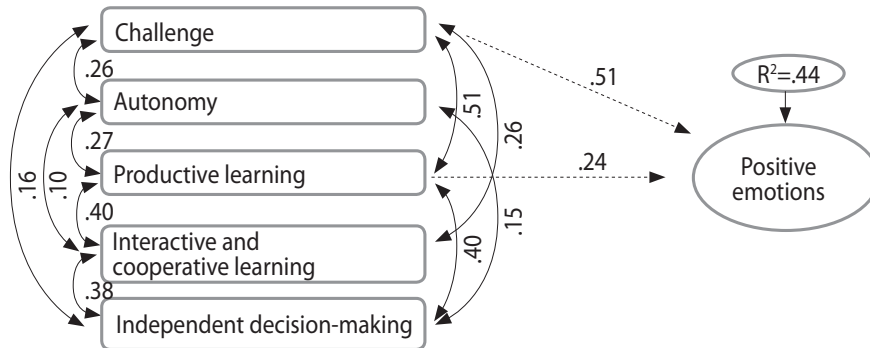
Figure 2. Predictors of negative emotions in school learning (Model 2)

The reason why we use two models is that positive and negative emotions have a tendency to occur in parallel, because no students exclusively like school without any negative emotions about school and school learning.

To test the hypothesis about self-regulated efficiency determining students' positive emotions we used AMOS statistics (Cunningham, & Wang, 2005) which is the best way to illustrate multiple and hierarchy regression. We tested the influence of five latent variables as components of self-regulated efficiency on positive emotions. The findings show that only *challenge* ($\beta = .51$; Figure 3, shown as dashed arrow) and *productive learning* ($\beta = .24$; Figure 3, shown as dashed arrow) have a significant effect on *positive emotions*, and that based on these two predictors 44% of the variance can be interpreted ($R^2 = .44$; Figure 3). At this point we come across the question about the variables *autonomy*, *interactive and cooperative learning* and *self-guided decision-making* (Figure 3) being excluded as predictors of positive emotions. Until such research data become available we offer our own interpretation based on the teaching practice and extrapolation of theoretical work. In contemporary schools and even universities there are unsatisfactory levels of encouragement of students' autonomy,

interaction, cooperative learning or self-guided decision making. In such conditions we cannot expect those variables to represent predictors of positive emotions in school learning. It is clear that these are the disadvantages of our educational system and that it would be useful to implement an experimental programme which would encourage autonomy, interaction, cooperative learning and independent decision making in schools and universities.

Standardized regression coefficients



Hierarchical regression

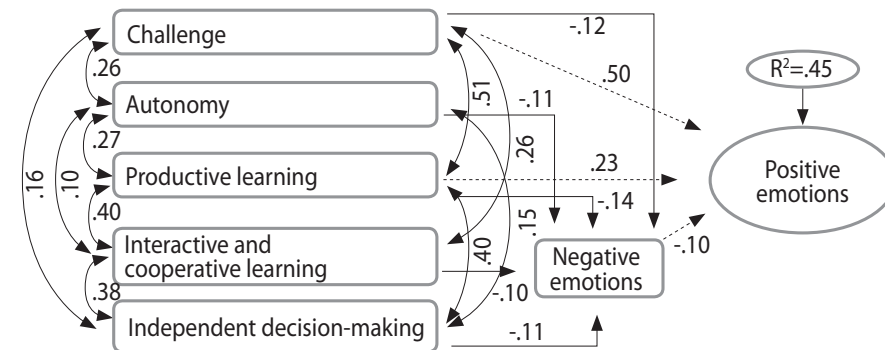


Figure 3. Predictors of positive emotions with mediation of negative emotions

Note: The solid lines represent Pearson's correlations while the dashed lines show beta coefficients. All the correlations and coefficients are significant at the level of .01.

When we introduced negative emotions as the mediation variable between self-regulated efficiency predictors and positive emotions, we observed insignificant changes of the model (Figure 3, the bottom diagram). This means that negative emotions do not significantly affect the self-regulated efficiency components as predictors of students' positive emotions. Although in negative correlation ($\beta = -.10$; Figure 3, the dashed arrow in the bottom diagram) with positive emotions and all the components of the self-regulated efficiency, negative emotions do not significantly affect the model of predilection. By comparing the top and the bottom diagram in Figure 3, we discover

that the effect of *challenge* on positive emotions ($\beta = .51$) is slightly reduced ($\beta = .50$) and that the effect of the *productive learning* variable on positive emotions ($\beta = .24$) is also slightly reduced ($\beta = .23$), but the model itself is not significantly altered.

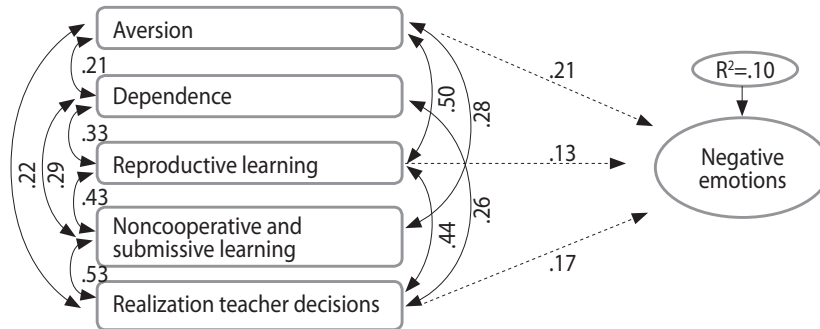
In general, the pedagogically significant findings from Figure 3 are as follows: 1) self-regulated efficiency is a significant predictor of students' positive emotions because only two of its components explain 44% of this relation variance ($R^2 = .44$; Figure 3, the left diagram); 2) although all five of the self-regulated efficiency components are significantly correlated (Figure 3, the ellipsis values), the regression analysis rejects three self-regulated efficiency components as predictors of positive emotions in school learning, which implies that the conditions in contemporary schools and universities do not support all the components of high school and university students' self-regulation; 3) negative emotions as a mediation variable combined with positive emotions do not significantly affect self-regulated efficiency components (Figure 3, the bottom diagram) even though they are in a significant negative correlation with those components. Those findings will be separately elaborated and compared to the findings of other research studies.

Self-regulated efficiency significantly predetermines students' positive emotions; however, in this research only *challenge* and *productive learning* explain 44% of the variance in this relation (Figure 3, the top diagram. Compare to Figure 1), while the explanation of the major part of the remaining variance needs to be found in relation to the three remaining self-regulated efficiency components – high school and university students' *autonomy*, *interactive and cooperative learning* and *self-guided decision making*. The proof of this hypothesis can be found in the research which shows that autonomy, competence and interaction predetermine intrinsic motivation (Hollebeak, & Amorose, 2005). It is well known that intrinsic motivation activates positive emotions directly. Therefore, three of the self-regulated efficiency components which are excluded from this research via multiple regression are significant for positive emotions. This, however, is not the case only with our sample, but with the research in some other countries as well. For example, the research shows that autonomy does not predict school achievement (Jang, Reeve, Ryan, & Kim, 2009), and the findings prove that Korean students are unhappy learners although, as achievers, they reached the top of the list consisting of 41 countries (ibidem, p. 658). Other research studies show that students' autonomy, especially when it is encouraged by their teachers, plays a significant role in students' involvement in school activities (Jang, Reeve, & Decy, 2010; Reeve, 2009; Reeve, & Jang, 2006). Hence, on the one side there is school practice which is deficient in support of autonomy and other components of students' self-regulated efficiency, while on the other side the research findings prove that actually encouraging autonomy and other components of self-regulated efficiency gives positive effects in terms of students' involvement in classes. From those findings, we can conclude that it is necessary to encourage high school and university students' autonomy, interaction and self-guided decision making in

school practice in order to reach a higher level of positive emotions. The basis of this is in the findings of our research which show that only two components of the self-regulated efficiency, challenge and productive learning, explain 44% of high school and university students' positive emotions about school.

Negative emotions introduced as the mediation variable between components of self-regulated efficiency and positive emotions reduce the effect of positive emotions, but not significantly (Figure 3, the bottom diagram). In other words, once there is a positive atmosphere in a classroom, negative emotions cannot endanger the established rapport to a great extent. This statement is in line with the findings of the research which proved that a positive emotional climate and class structure created by a teacher give strong effects in terms of students' involvement in school activities (Jang, Reeve, & Deci, 2010). This is the case as long as positive emotions in class prevail. However, if negative emotions prevail they give different effects such as passivity, giving up, withdrawal or lack of control over students' own work (Skinner, & Belmont, 1993). For this reason, our research design sets the reverse design of positive and negative emotions. We, therefore, compare negative components of self-regulated learning with negative emotions (Figure 2) and introduce positive emotions as the mediated variable (Figure 4).

Standardized regression coefficients



Hierarchical regression

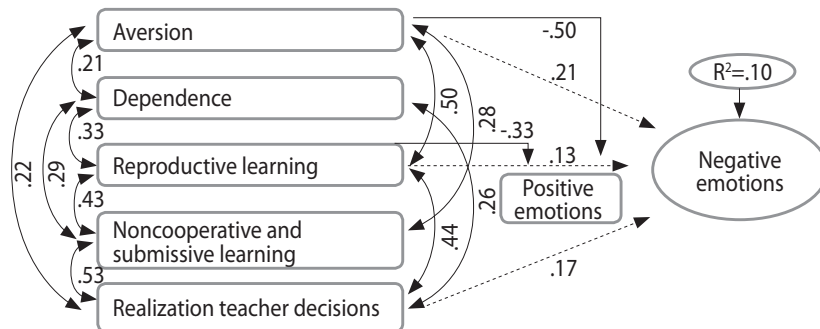


Figure 4. Predictors of negative emotions with mediation of positive emotions

Note: The solid lines represent Pearson correlations while the dashed lines show beta coefficients. All the correlations and coefficients are significant at the level of 0.01.

As shown in Figure 4, positive emotions as the mediation variable do not affect changes in negative emotions (the bottom diagram). This has already proven itself in practice because we know that a negative climate is not easily transformed into a positive climate. What can be deemed interesting is that addiction and uncooperative learning do not predetermine negative emotions (Figure 4, the bottom diagram) while positive emotions do not correlate to these variables. This proves the fact that high school and university students' addiction and submissiveness is tolerated or even rewarded in schools. The findings of this research agree with the research of Reinharda Pekrun and associates, which prove that boredom and hassle in school classes correlate in a negative fashion to students' self-regulation ($r = -0.22$), to control ($r = -0.30$) and attention focus ($r = -0.77$), and therefore significantly obstruct school achievements (Goetz, Daniels, Stupnisky, & Perry, 2010, p. 541). As a conclusion, negative emotions have a syndrome effect in class. This research encompasses only certain components of those emotions in relation to students' self-regulated efficiency and discovers that in this area only 10% of the variance is explained ($R^2 = 0.10$, Figure 4, the bottom diagram), which, in a way, brings pedagogical optimism because the major ration of the variance ($R^2 = 0.45$, Figure 3, the bottom diagram) is explained via regression of only two components of the self-regulated efficiency and positive emotions.

Further, in a simplified form we show a relation of the self-regulated efficiency to high school and university students' positive and negative emotions (Figure 5). From this scheme we can interpret several highly interesting pedagogical findings. First, *challenge* is a much stronger predictor of positive emotions ($\beta = 0.50$) in class than the opposite *aversion* in relation to negative emotions ($\beta = 0.21$). It would be interesting to conduct a new research to find out the ratio of our high school and university students' challenge and aversion. However, the message of these findings is clear – schools need to encourage challenge and reduce aversion. This is in line with the research findings which show that aversion and hassle are not in the absolutely opposite relation to interest and positive emotions (Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010). The situations in which classes are not interesting are common, however, students attend them and acquire curriculum contents because they aspire to advance in modules, graduate or have other motives.

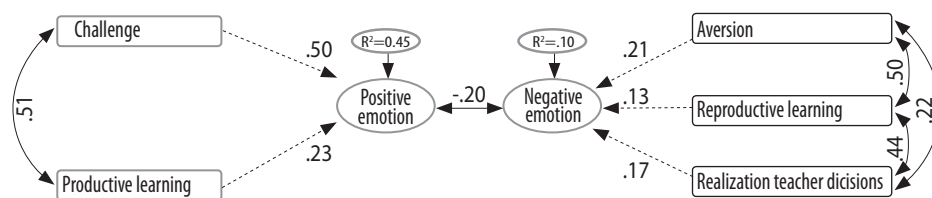


Figure 5. Components of self-regulated efficiency as predictors of emotions about school and school learning

Note: The dashed lines show beta coefficients; all correlations and coefficients are significant at the level of 0.01

Secondly, it is encouraging to find that *productive learning* is a stronger predictor of positive emotions ($\beta = 0.23$) than *reproductive learning* is a predictor of negative

emotions ($\beta = 0.13$). If we know that schools encourage reproductive learning and that high school and university students are used to it, then it is especially useful for pedagogy to find out that *challenge* acts with more efficiency than reproductive learning. We would expect challenge to bring frustration and insecurity and that it is a predictor of negative emotions. However, that did not prove to be the case because those two variables are in a negative correlation ($r = -0.12$; Figure 3, the bottom diagram).

Thirdly, *execution of teachers' decisions* is a predictor of negative emotions ($\beta = 0.17$), while self-guided decision making is not a predictor of positive emotions (compare Figure 1 and Figure 3). This clearly suggests teachers need to reduce their prescriptive teaching methods and enable students for their self-guided decision making at the same time. One research shows that neither too much nor too little of control in class proved to be productive (Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010), and another that optimum structure results in optimum autonomy in class (Jang, Reeve, & Deci, 2010). Our research shows that high school and university students often execute teachers' decisions with negative emotions. Therefore, the optimal balance between students' independence and teachers' orders represents the direction in which class lectures should go.

Forthly, the correlation between positive and negative emotions about schools and school learning is negative ($r = -0.20$; Figure 4) but still low, which shows that high school and university students are used to having both positive and negative emotions in class.

It is important to conclude that we proved the hypothesis that self-regulated efficiency significantly predetermines high school and university students' positive and negative emotions, and that within this hypothesis we identified the key components of that predilection. All this has provided us with certain new and significant pedagogical knowledge, as well as with new subjects to be researched.

Discussion

In this paper, we proved that there are self-regulated efficiency components which predetermine high school and university students' positive and negative emotions in class. During the process of proving this hypothesis we found out that not all of the components of self-regulated efficiency are predictors of positive emotions. The findings showed that the key predictor of this efficiency was *challenge* (Figure 3; $\beta = 0.51$), followed by *productive learning* (Figure 3; $\beta = 0.24$). Three variables as predictors of the high school and university students' self-regulated efficiency have been rejected via multiple regression: *autonomy*, *interactive and cooperative learning* and *self-guided decision making*. As much as it was significant to discover the key components of self-regulated efficiency as predictors of positive emotions, it was equally significant to realize that autonomy and other components were excluded from this predilection. Edward Deci and associates' research proved that students' autonomy directly influenced their involvement in school activities (Jang, Reeve, & Deci, 2010). In our research, autonomy was excluded via regression as a predictor of positive emotions in class. Therefore, those teaching models that strengthen students'

autonomy should be developed. Such models are interactive learning and classes based on taking responsibility, as well as students' self-guided decision making. Our sample specifically excluded the variables of interaction, cooperative learning and self-guided decision making as predictors of positive emotions. Pedagogically, it would be very desirable to implement an experimental programme which would specifically focus on strengthening those components of high school and university students' self-regulated efficiency.

Once we included negative emotions in the hierarchy regression as the mediation variable between the components of self-regulated efficiency and positive emotions, the predictors of positive emotions were significantly reduced (Figure 3), although statistically insignificant, but at the same time the correlation between negative and positive emotions ($r = -0.20$, Figure 5) was significantly reduced ($\beta = -0.10$, Figure 3). This means that the well established rapport in a class will remain stable despite the potential occurrence of negative emotions. When we tested the effect of negative high school and university students' self-regulated efficiency components on their negative emotions via multiple regression, we discovered three predictors: *aversion* ($\beta = 0.24$, Figure 4), *reproductive learning* ($\beta = 0.13$, Figure 4), and *execution of teachers' decisions* ($\beta = 0.17$, Figure 4). Once we applied a hierarchy regression and included positive emotions as mediation variable, these relations did not change and positive and negative emotions did not establish a significant correlation. In other words, once a negative emotional climate is established in class, positive emotions cannot significantly and radically change such previously established atmosphere. It would probably take time and numerous other predictors that we did not test in this research to change it. In this model (Figure 4) the variables of *addiction* and *execution of teachers' decisions* have also been excluded as predictors of negative emotions. This is yet another indicator that classes and learning should be organized through interaction. Certain recent research studies support that claim. The research showed that by learning how to learn via interactive workshops our students quickly acquire techniques of learning, and also that thanks to the implementation of such techniques the motivation for that way of work has increased (Suzić, 2005). Another research discovered that positive emotions which occur with motivation were more prominent in students in schools with interactive classes, than in students in traditional schools (Stanković, 2007). Apart from that, it showed that traditional classes insufficiently support students' independence and that conditions in which students are expected to work independently and make decisions cause fear in them (ibidem, p. 217). Other research studies, just like ours, showed that negative emotions are related to absence of challenges, aversion in classes, reproductive learning, dominant teachers' role or execution of teachers' decisions. All those are characteristic of traditional schools (Suzić, 1995, p. 19) which had been strongly established by the end of the 20th century (Hirsch, 1996, p. 8), while practice showed that these characteristics can be changed in the pedagogically desired direction.

Finally, it is necessary to emphasize that this research brings new knowledge about the components of self-regulated efficiency as predictors of high school and university and students' positive emotions. Apart from that, it raises questions for further research and offers certain instructions for further pedagogical actions and school practice. If we manage to inspire any researcher to conduct a further study or any practitioner to consider a different view on school practice or to implement different actions in their practice, we shall consider the desired purpose of our assignment accomplished.

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Samoregulacijska uspješnost i emocije srednjoškolaca i studenata

Sažetak

U ovoj studiji autori istražuju utjecaj komponenata samoregulacijske uspješnosti učenika i studenata na njihove pozitivne i negativne emocije o školi i školskom učenju. Uzorkom je obuhvaćeno 366 srednjoškolaca i 535 studenata. Rezultati pokazuju da izazov i produkcijsko učenje predodređuju 44% varijance u pozitivnim osjećanjima, a da su autonomija, interaktivno ili kooperativno učenje te samostalno donošenje odluka multiplom regresijom odbačene varijable kao prediktori pozitivnih emocija. Kada su u hijerarhijskom regresijskom modelu kao medijator uvedene negativne emocije, pokazalo se da one neznatno smanjuju prediktore pozitivnih emocija, ali da bitno ne mijenjaju uspostavljeni odnos. Na isti način ponaša se model u kojem je multiplom regresijom testiran utjecaj negativnih komponenti samoregulacijske uspješnosti na negativne emocije. Averzija, reprodukcijno učenje i izvršavanje odluka nastavnika predodređuju negativne emocije, ali objašnjavaju samo 10% varijance, pri čemu pozitivne emocije kao medijacijska varijabla ne mijenjaju model.

Ključne riječi: izazov; negativne emocije; pozitivne emocije; produkcijsko učenje; samoregulacijska uspješnost

Uvod

Emocionalna osnova nastave nedovoljno je istražena. Nije sporno da nastava predstavlja izazov za učenike i studente, ali taj izazov može biti pozitivan i negativan. Jedan učenik će željeti savladati nastavne izazove zato što nastoji ne razočarati roditelje ili da bi opravdao očekivanja okoline, a drugi će te iste izazove savladavati zato što uživa u spoznavanju novog, uživati će u učenju. S jedne strane, učenici i studenti pristupit će izazovu da izbjegnju strah, a s druge da dožive zadovoljstvo. Ako prihvatimo tezu Stanley Greenspana da su emocije generator naše kognicije (Greenspan, & Benderly 1997), i ako znamo da se tu radi o pozitivnim emocijama, tada se nameće pitanje kakav je odnos pozitivnih i negativnih emocija u nastavi i akademskom

učenju te kakav je odnos jednih i drugih prema izazovu i drugim komponentama samouspješnost učenika i studenata. Naše istraživanje posvećeno je upravo odnosu između samoregulacijske uspješnosti i pozitivnih i negativnih emocija mladih.

Što je to samoregulacijska uspješnost? Ona se ponajprije odnosi na uvjerenost onoga tko uči da sam može savladati izazove i obaveze, odnosno da može otkloniti prepreke na koje nailazi. Ovdje nas zanima ponajprije samoregulacija u području akademskog postignuća. „Samoregulacijska uspješnost obuhvaća također i akademske ciljeve i aspiracije, osobne standarde kvalitete rada koje osoba smatra prihvatljivim i uvjerenje u sposobnost ostvarivanja akademskog postignuća nakon prolaska određene razine instrukcija, podrazumijeva ponajprije akademske performanse i odgovarajuće sposobnosti“ (Caprara i suradnici, 2008, str. 526). Istraživanje je pokazalo da su pozitivne emocije temelj za individualnu samoregulaciju (Pekrun, Goetz, Titz, and Perry, 2002). Odnos samoregulacijske uspješnosti i učeničkih emocija koji ovdje istražujemo zahvaća i negativne emocije jer nas zanima kako one utječu na komponente samoregulacije kojima se učenici i studenti koriste u nastavi.

Samoregulacijska uspješnost kao pojmovna kategorija pripada *socijalno kognitivnoj teoriji* (Bandura, 1986; Zimmerman & Cleary, 2006). Radi se o teoriji koja se bavi načinom na koji čovjek kognicijom regulira i usmjerava svoje ponašanje i vrijednosti. U budućnosti možemo očekivati da će samoregulacijska uspješnost u akademskom postignuću imati sve veći značaj zato što živimo u učećoj civilizaciji u kojoj sposobnost brzog učenja i korištenja informacija predstavlja uvjet slobode i sreće svih građana, i mladih i starih. „Na početku XXI stoljeća Bandura (2002) ističe da rapidni pomaci u informacijskim i tehnološkim promjenama zahtijevaju razvoj kognitivnih kompetencija. Da bi ljudi uspješno regulirali svoje učenje, svoje kognitivne, emocionalne i bihevioralne akcije, nužno je da nauče učiti i da zavole učenje. U ovom istraživanju provjeravamo odnos između emocija i samoregulacijske uspješnosti srednjoškolaca i studenata.

Samoregulacijska uspješnost

Prvo logično pitanje koje možemo postaviti u vezi s akademskom samoregulacijskom uspješnošću je podržavaju li škole i fakulteti samoregulaciju učenika i studenata ili je na svojevrsan način guše. O tome nemamo rezultate istraživanja koji bi dali kvalitetne znanstvene odgovore, ali praksa nam govori da su škole u prošlosti njegovale reprodukcijско učenje utemeljeno na memoriranju i reprodukciji, što izravno kolidira sa samoregulacijskom uspješnošću učenika. U budućnosti možemo očekivati da će škole sve više uvoditi čak u metode i tehnike osobne kontrole vlastitog učenja. Da bi samoregulacija djelovala, nužno je ispuniti tri preduvjeta: 1) *self monitoring*, 2) da su vlastiti ciljevi povezani s vrijednostima i vrijednosnim orijentacijama kako bi djelovala motivacija samodeterminacije i 3) osigurati socijalnu podršku za realizaciju akademskih ciljeva (Caprara i suradnici, 2008, str. 525). Prema socijalno kognitivnoj teoriji samoregulacija podrazumijeva vezu između kognitiv-

nih i metakognitivnih mehanizama samoprocjene, odnosno, podrazumijeva spremnost pojedinca da samostalno procjenjuje svoje prednosti i slabosti te da u vezi s tom procjenom poduzima akcije s ciljem kompenziranja slabosti i razvijanja vlastite prednosti pri bavljenju izazovima, produkcijskim učenjem, donošenjem odluka i drugim komponentama samoregulacije.

Ovdje nas posebno zanima samoregulacija prilikom učenja jer je naše istraživanje posvećeno ponajprije akademskoj samoregulaciji. Samoregulirano učenje generalno se definira kao generiranje kognicije, emocija i akcija koje su orijentirane ili usmjerene na izvršavanje akademskih obaveza (Schunk & Zimmerman, 1994). Autori izvode različite komponente samoregulacijskog učenja. Jedna takva klasifikacija podrazumijeva: 1) upotrebu kognitivnih strategija za obradu, učenje i razumijevanje materije ili građe – elaboracija, organizacija i kritičko mišljenje, 2) meta-kognitivne strategije koje omogućuju kognitivni monitoring i superviziju vlastitog učenja – korištenje vremena i uvjeta, kontrolu anksioznosti i slično i 3) determinaciju volje da se ustraje na ostvarenju cilja, a to podrazumijeva kapacitet učenika da ustraje usprkos teškoćama – regulacija napora, smanjenje oklijevanja (Vansteenkiste i suradnici, 2009, str. 674). Sličnu klasifikaciju komponenata samospješnog učenja nalazimo u „Skali samoreguliranog učenja“ koju je konstruirao Bandura (1990), a kasnije baždario i na talijanskom uzorku (Bandura i sur., 1996). Ona sadrži sljedeće komponente: 1) organiziranje vlastitih školskih aktivnosti i obaveza, 2) kontrolu distraktora, 3) pripremanje uvjeta za učenje i 4) samomotivaciju. Komponente samoregulacijske uspješnosti učenika ovdje nas posebno zanimaju zato što želimo saznati koja od njih najznačajnije predodređuje emocije u školskom učenju, jer su emocije u osnovi uspješnosti kognicije.

Tragom spoznaja iz istraživanja i suvremene literature ovdje smo izdvojili pet ključnih komponenata samoregulacijske uspješnosti učenika: 1) izazov nasuprot averziji, 2) autonomija nasuprot ovisnosti, 3) produkcijsko nasuprot reprodukcijom učenju, 4) interakcija i kooperativno učenje nasuprot individualizmu i nekooperativnosti i 5) samostalno odlučivanje nasuprot submisivnosti. Tih pet subtestova mjeri instrument *SRU – Samoregulacijska uspješnost učenika* konstruiran za ovo istraživanje.

Emocije učenika

Pozitivne emocije su u osnovi čovjekove kognicije, a osnovu za tu tezu nalazimo u fiziologiji našeg nervnog sustava. Poznato je da pozitivne emocije potiču lučenje serotonina, hormona zadovoljstva, a da negativne emocije potiču lučenje kortizola, hormona stresa. Ono što doživi kao zadovoljstvo, naš organizam dulje pamti jer serotonin pospješuje razmjenu materija i poboljšava funkcioniranje brojnih organa u čovjekovu tijelu. To se izravno reflektira na uspješnost učenja. To najbolje ilustrira primjer tragičnog gubitka neke bliske osobe. Kada se dogodi takav gubitak, čovjek danima, mjesecima pa i godinama ne spava normalno, ne jede i tuguje, čak ne može razgovarati o pokojniku. Kada prođu godine ili određeno vrijeme, osoba koja je doživjela gubitak počinje normalno funkcionirati zato što je nervni sustav uspio potisnuti negativne emocije, a osoba prihvatiti činjenicu gubitka. Dakle, neugodna iskustva

čovjekov nervni sustav potiskuje. Što je s ugodnim iskustvima? Njih se čovjek vrlo rado sjeća i priziva ih u sjećanje zato što donose serotonin, hormon zadovoljstva. Koliko naše škole donose djeci ugodnih, a koliko neugodnih emocija, mjerili smo u ovom istraživanju. Osim toga, ovdje smo mjerili i to imaju li ugodne i neugodne emocije svoje prediktore u samoregulacijskoj uspješnosti učenika i studenata.

Istraživanje je pokazalo da ugodne emocije: doprinose rješavanju problema, štite zdravlje, potiču povezanost sa značajnim drugim, leže u osnovi uspješne samoregulacije i usmjeravaju grupnu interakciju (Pekrun, Goetz, Titz, & Perry, 2002). Da u osnovi uspješnog učenja leže pozitivne emocije, potvrđuju još neka istraživanja. Utvrđeno je, na primjer, da te emocije potiču motivaciju za učenje, jačaju samoregulatorni napor, aktiviraju kognitivne resurse, pomažu realizaciji ciljeva (Ashby, Isen, & Turken, 1999; Pekrun, 2006). Kada ih razmatramo u okviru školskog i akademskog postignuća, emocije ne trebamo uzimati samo kao pozitivne ili negativne; one su vrlo često ambivalentne, i pozitivne i negativne. Istraživanje je pokazalo da su djeca navodila kako im je škola ujedno i ugodna i neugodna, da ih plaši, ali i raduje (Suzić, 2009). Te sučeljene emocije zahvatili smo i u istraživanju koje ovdje predstavljamo.

Negativne emocije koje nastavnici demonstriraju tijekom nastave, kao što su zabrinutost, napetost ili srdžba, izravno utječu na smanjenje motivacije učenika i generiraju negativne osjećaje kod djece (Frenzel i suradnici, 2009). Još jedno istraživanje ukazuje na činjenicu da negativne emocije kočice ili sprečavaju pažnju, a pozitivne ih potiču (Chao, 2010). Strah od neuspjeha i briga učenika za socijalni ugled rezultiraju brigom i strahom za vlastite performativne ciljeve (Suzić, 2002). Značajno je pitanje o odnosu negativnih emocija prema performativnoj uspješnosti, o tome smanjuju li negativne emocije izazov i druge komponente performativne uspješnosti učenika i studenata. Upravo na to pitanje dat ćemo odgovor ovim istraživanjem. Isto tako, želimo saznati mijenja li se predileksija pozitivnih emocija pod utjecajem performativne uspješnosti kada u model hijerarhijske regresije uvedemo negativne emocije.

Naše istraživanje

Hipoteza

U ovom istraživanju pošli smo od pretpostavke da samoregulacijska uspješnost predodređuje pozitivne i negativne emocije o školi i školskom učenju, kao i akademskom postignuću, te da u okviru samoregulacijske uspješnosti možemo identificirati ključne prediktore pozitivnih i negativnih emocija učenika i studenata.

Ako prilikom dokazivanja hipoteze otkrijemo da postoji jedna dominantna komponenta koja predodređuje samoregulacijsku uspješnost učenika i studenata, time ćemo ostvariti dvije pedagoške koristi. Prvo, saznat ćemo što kod učenika najviše „pali“, što najviše leži u latentnoj podlozi njihovih pozitivnih i negativnih emocija, i drugo, saznat ćemo koje su komponente samoregulacijske uspješnosti isključene, a na osnovi toga zaključiti što trebamo poduzeti kako bismo aktivirali te motivacijske komponente koje su potisnute.

Način realizacije istraživanja

Ispitanicima su podijeljeni listovi za odgovore. Nakon što bi ispitivač pročitao pitanje jednog testa, svi ispitanici zaokružili bi odgovor na skali Likertova tipa. Ako neko pitanje nije bilo jasno, podizanjem ruke ispitanik bi ispitivaču dao znak da želi objašnjenje. Time je postignuto da istraživanje teče odgovarajućim tempom i da se uklone sve nejasnoće. Ispitanicima je skrenuta pažnja na to da će podaci o njihovim odgovorima biti korišteni isključivo u znanstvene svrhe te da neće biti dostupni njihovim nastavnicima. Tako prikupljeni podaci obrađeni su programom SPSS 15 Statistica for Windows. Kompletno istraživanje ostvareno je u lipnju 2010. godine.

Uzorak

Uzorkom je obuhvaćeno 366 srednjoškolaca i 535 studenata (Tabela 1). Hi-kvadrat test je pokazao da uzorak nije ujednačen ($\chi^2 = 31,69$; statistički značajno na nivou 0,001) po kriteriju srednjoškolci u odnosu na studente, ali veličina jednog i drugog poduzorka daje nam pravo na određene generalizacije. Kompletan uzorak je s područja grada Banja Luka.

Tablica 1.

Isto tako, ujednačenost uzorka testirali smo po spolu jer su u uzorku 183 muška i 718 ženskih ispitanika, što uz $\chi^2 = 317,68$ (značajno na nivou 0,001) pokazuje da po tom kriteriju ne postoji ujednačenost, tako da nije opravdano izvoditi generalizacije s obzirom na taj kriterij. To je razlog da statistički nismo ni računali razlike u varijablama na osnovi spola ispitanika.

Instrumenti

U istraživanju su korištena dva instrumenta: 1) SRU – Samoregulacijska uspješnost učenika i 2) SPINO – Skala pozitivnih i negativnih osjećaja (Positive and Negative Affect Schedule¹ – Watson, Tellegen, & Clark, 1998). Oba instrumenta ovdje ćemo detaljnije opisati.

SRU – Samoregulacijska uspješnost učenika je instrument vlastite izrade, sadrži 94 stavke raspoređene u deset subtestova. Unutrašnja konzistentnost cijelog instrumenta mjerena Kronbahovim alpha testom iznosi $\alpha = 0,82$. Svi subtestovi rađeni su tako da svaka stavka ima svoju suprotnu verziju. Svi subtestovi naslovljeni su prema onome što mjere. Prva dva subtesta su *Izazov* ($\alpha = 0,79$) s 10 stavki i *Averzija* ($\alpha = 0,87$) s 10 stavki. Sljedeće *Autonomija* ($\alpha = 0,57$) s 9 stavki i *Ovisnost* ($\alpha = 0,62$) s 9 stavki. Sljedeća dva subtesta su *Produkcijsko učenje* ($\alpha = 0,65$) s 9 stavki nasuprot *Reprodukcijском učenju* ($\alpha = 0,66$) s 9 stavki. Sljedeći subtestovi su *Interakcija i kooperativno učenje* ($\alpha = 0,56$) s 9 stavki nasuprot *Nekooperativnosti i submisivnom učenju* ($\alpha = 0,60$) s 9 stavki. Na kraju su dva subtesta o odlučivanju, *Samostalno donošenje odluka* ($\alpha = 0,69$) s 10 stavki nasuprot *Izvršavanju odluka nastavnika* ($\alpha = 0,63$) s 10 stavki. Na sva pitanja

¹ Instrument je korišten uz odobrenje autora.

odgovara se skalom Likertova tipa od 1 = *nimalo ne vrijedi za mene* do 5 = *potpuno vrijedi za mene*. Suprotno postavljene stavke ovog instrumenta omogućuju računanje dosljednosti odgovora ispitanika.

SPINO – *Skala pozitivnih i negativnih osjećaja* (Positive and Negative Affect Schedule – Watson, Tellegen, & Clark, 1998) ima 20 stavki od kojih 10 mjeri pozitivne ($\alpha = 0,87$), a ostalih 10 negativne ($\alpha = 0,87$) osjećaje učenika za vrijeme nastave i ispita. Na sva pitanja odgovara se skalom Likertova tipa od 1 = *nimalo ne vrijedi za mene* do 5 = *potpuno vrijedi za mene*. Treba istaći da stavke u SPINO-skaleru nisu postavljene suprotno, kao što je to slučaj u instrumentu SRU, tako da se ovim instrumentom ne može izračunati dosljednost odgovora ispitanika.

Rezultati istraživanja

Naša hipoteza glasi: samoregulacijska uspješnost znatno predodređuje pozitivne i negativne emocije učenika i studenata o školi i školskom učenju, kao i akademskom postignuću, te u okviru samoregulacijske uspješnosti možemo identificirati komponente koje su ključne za tu predileksiju. Za provjeru te hipoteze konstruirali smo modele 1 i 2 (u shemama 1 i 2) koje ćemo testirati primjenom multiple i hijerarhijske regresijske analize.

Shema 1.

Multipla regresija omogućuje nam da izvedemo beta koeficijente koji nam pokazuju „koja od ‘nezavisnih’ ili prediktorskih varijabli najviše determinira zavisnu varijablu“ (Suzić, 2007, str. 50).

Shema 2.

U Modelu 1 zanima nas koja komponenta samoregulacijske uspješnosti najviše predodređuje pozitivne osjećaje koje učenici i studenti imaju prema školskom učenju, a u Modelu 2 testiramo prediktore negativnih osjećanja. Razlog zbog kojeg se koristimo dvama modelima jest taj što se emocije javljaju paralelno kao pozitivne i negativne s obzirom na to da ne postoje đaci koji isključivo i samo vole školu i školsko učenje, a da nemaju nijednu negativnu emociju o školi i učenju.

Shema 3.

Za testiranje hipoteze o tome da samoregulacijska uspješnost predodređuje pozitivne osjećaje učenika i studenata koristili smo AMOS statistiku (Cunningham & Wang, 2005) koja najilustrativnije predstavlja multiplu i hijerarhijsku regresijsku analizu. Testirali smo utjecaj pet latentnih varijabli kao komponente samoregulacijske uspješnosti na pozitivne emocije. Pokazalo se da samo *izazov* ($\beta = 0,51$; Shema 3, prikazano isprekidanom strelicom) i *produkcijско učenje* ($\beta = 0,24$; Shema 3, prikazano isprekidanom strelicom) imaju značajan utjecaj na *pozitivne emocije*, te da se na temelju ta dva prediktora može tumačiti 44% varijance ($R^2 = 0,44$; Shema 3). Postavlja se pitanje zašto su *autonomija*, *interaktivno i kooperacijsko učenje* te *samostalno donošenje odluka*

(Shema 3) isključene varijable kao prediktori pozitivnih emocija. Ovdje bi nam dobro došli istraživački odgovori, ali dok ne dobijemo nova istraživanja tog problema, dat ćemo neka tumačenja na osnovi praktičnih iskustava i analize teorijskih radova. Naime, u današnjim školama, pa i na fakultetima, malo je podržana autonomija učenika i studenata, premalo je interaktivnog i kooperacijskog učenja, a o samostalnosti učenika i studenata u donošenju odluka gotovo da se i ne vodi računa. U tim uvjetima ne možemo očekivati da te varijable budu prediktori pozitivnih osjećaja u školskom učenju. Jasno je da se ovdje radi o nedostacima u našem školskom sustavu i da bi bilo korisno eksperimentalno testirati program koji potiče autonomiju, interaktivno i kooperativno učenje te samostalno donošenje odluka učenika i studenata.

Kada smo negativne osjećaje uveli kao medijatorsku varijablu između prediktora iz sfere samoregulatorne uspješnosti i pozitivnih osjećaja, dobili smo neznatne promjene modela (Shema 3, desni dijagram). To znači da negativne emocije bitno ne utječu na komponente regulacijske uspješnosti kao prediktore pozitivnih osjećanja učenika i studenata. Iako su u negativnoj vezi ($\beta = -0,10$; Shema 3, prikazano isprekidanom strelicom na desnom dijagramu) s pozitivnim osjećajima i svim komponentama samoregulacijske uspješnosti, negativni osjećaji ne utječu bitno na model predileksije. Kada usporedimo lijevi i desni dijagram na Shemi 3, uočiti ćemo da se djelovanje *izazova* na pozitivne emocije ($\beta = 0,51$) neznatno smanjilo ($\beta = 0,50$), kao i da se djelovanje varijable *produkcijско učenje* na pozitivne emocije ($\beta = 0,24$) neznatno smanjilo ($\beta = 0,23$), ali da se model nije bitno promijenio.

Generalno gledano, iz Sheme 3 možemo očitati nekoliko pedagoški značajnih nalaza: 1) Samoregulacijska uspješnost jest značajan prediktor pozitivnih emocija učenika i studenata jer samo dvije njezine komponente objašnjavaju 44% varijance tog odnosa ($R^2 = 0,44$; Shema 3, lijevi dijagram); 2) Iako je svih pet komponenata samoregulacijske uspješnosti u značajnoj korelaciji (Shema 3, veličine na elipsama), regresijska analiza isključila je tri komponente samoregulacijske uspješnosti kao prediktore pozitivnih emocija u nastavi, što ukazuje na to da u današnjim školama i na fakultetima vladaju uvjeti koji ne potiču sve komponente samoregulacije učenika i studenata; 3) negativne emocije kao medijacijska varijabla u kombinaciji s pozitivnim emocijama nemaju značajnijeg utjecaja na komponente samoregulacijske uspješnosti (Shema 3, desni dijagram) iako su u značajnoj negativnoj korelaciji s tim komponentama. Te nalaze ovdje ćemo posebno komentirati i usporediti s nalazima drugih istraživanja.

Samoregulacijska uspješnost značajno predodređuje pozitivne emocije učenika i studenata, ali u našem istraživanju samo *izazov* i *produkcijско učenje* objašnjavaju 44% varijance tog odnosa (Shema 3, lijevi dijagram, usporedi sa Shemom 1), a objašnjenje većeg dijela preostale varijance treba tražiti u preostale tri komponente samoregulatorne uspješnosti, u *autonomiji*, *interaktivnom* i *kooperativnom učenju* te u *samostalnom donošenju odluka* učenika i studenata. Uporište za tu postavku nalazimo u istraživanju koje je pokazalo da autonomija, kompetencija i interakcija predodređuju intrinzičnu motivaciju (Hollebeak & Amorose, 2005). Poznato je

da intrinzična motivacija izravno aktivira pozitivne emocije. Dakle, tri komponente samoregulacijske uspješnosti, u našem istraživanju isključene multiplom regresijom, bitne su za pozitivne emocije. Ali to nije slučaj samo s nalazima ostvarenim na našem uzorku, tako je i u drugim krajevima svijeta. Konkretno, istraživanje je pokazalo da autonomija individualno ne predodređuje školsko postignuće (Jang, Reeve, Ryan, & Kim, 2009), a u ovom istraživanju je dokazano da koreanski đaci nisu sretni učenici iako su u vrhu postignuća među ispitanicima iz 41 zemlje (ibidem, str. 658). Druga istraživanja pokazuju da autonomija učenika posebno poticana od nastavnika ima bitnu ulogu u pogledu uključenosti učenika u školske aktivnosti (Jang, Reeve, & Decy, 2010; Reeve, 2009; Reeve & Jang, 2006). Dakle, s jedne strane imamo školsku praksu koja slabo podržava autonomiju i druge komponente samoregulacijske uspješnosti učenika, a s druge istraživanja koja pokazuju da poticanje upravo autonomije i drugih komponenata samoregulacijske uspješnosti daje pozitivne efekte u pogledu uključenosti u nastavu. Iz tih nalaza i našeg istraživanja možemo zaključiti da je u nastavnoj praksi neophodno poticati autonomiju, interakciju i samostalno odlučivanje učenika i studenata kako bismo ostvarili višu razinu pozitivnih emocija. Osnovu za to daje nalaz našeg istraživanja koji pokazuje da samo dvije komponente samoregulacijske uspješnosti, izazov i produkcijsko učenje, objašnjavaju 44% pozitivnih osjećaja učenika i studenata u nastavi.

Kada negativne emocije uvedemo kao medijacijsku varijablu između komponenata samoregulacijske uspješnosti i pozitivnih emocija, to smanjuje djelovanje pozitivnih emocija, ali ne značajno (Shema 3, desni dijagram). Drugim riječima, kada u učionici vlada pozitivna atmosfera, tada negativne emocije ne mogu mnogo pokvariti uspostavljeni odnos pozitivnih osjećaja. To je u suglasnosti s rezultatima istraživanja u kojem je utvrđeno da pozitivna emocionalna klima i struktura sata koju kreira nastavnik daju visoke efekte u pogledu uključenosti učenika u nastavne aktivnosti (Jang, Reeve, & Deci, 2010). To vrijedi kada prevladavaju pozitivne emocije u razredu, ali kada prevladavaju negativne emocije, imat ćemo drugačije efekte kao što su: pasivnost, odustajanje, povlačenje i slaba kontrola vlastitog rada, što je pokazalo drugo istraživanje (Skinner & Belmont, 1993). To je razlog zbog kojeg smo u našem istraživačkom dizajnu postavili obrnuti dizajn pozitivnih i negativnih emocija. Naime, sada smo negativne komponente samoregulacijskog učenja suprotstavili negativnim osjećajima (Shema 2), a pozitivne osjećaje uveli kao medijacijsku varijablu (Shema 4).

Shema 4.

Kako vidimo na Shemi 4, pozitivni osjećaji kao medijacijska varijabla nemaju utjecaja na promjenu negativnih osjećaja (desni dijagram). To nam je već poznato iz prakse jer znamo da negativnu klimu nije tako lako preokrenuti u pozitivnu. Zanimljivo je da ovisnost i nekooperacijsko učenje ne predodređuju negativne osjećaje (Shema 4, desni dijagram), a da pozitivni osjećaji nemaju negativnu korelaciju s tim varijablama. To dokazuje da se u školama tolerira, pa čak i nagrađuje, ovisnost i sub-

misivnost učenika i studenata. Rezultati našeg istraživanja slažu se s istraživanjem Reinharda Pekruna i suradnika, u kojem je utvrđeno da dosada i gnjavaža u nastavi negativno koreliraju sa samoregulacijom učenika ($r = -0,22$), s kontrolom ($r = -0,30$) i koncentracijom ($r = -0,77$) i da ozbiljno smetaju školskom postignuću (Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010, str. 541). Negativne emocije, dakle, imaju sindromni efekt u nastavi. U našem smo istraživanju zahvatili samo određene komponente tih emocija u odnosu na samoregulatornu uspješnost učenika i otkrili da se u tom prostoru objašnjava samo 10% varijance ($R^2 = 0,10$, Shema 4, desni dijagram), što u izvjesnom smislu donosi pedagoški optimizam jer je mnogo veći omjer varijance ($R^2 = 0,45$, Shema 3, desni dijagram) objašnjen regresijom samo dvije komponente samoregulacijske uspješnosti i pozitivnih osjećaja.

Sada ćemo u pojednostavljenom obliku prikazati odnos samoregulacijske uspješnosti prema pozitivnim i negativnim osjećajima učenika i studenata (Shema 5). Iz te sheme možemo očitati nekoliko pedagoški vrlo zanimljivih podataka. Prvo, *izazov* je mnogo jači prediktor pozitivnih osjećaja ($\beta = 0,50$) u nastavi nego što je to njegova suprotnost *averzija* u odnosu na negativne osjećaje ($\beta = 0,21$). Bilo bi zanimljivo, u novom istraživanju, saznati koliko je u našoj nastavi izazova, a koliko averzije među učenicima i studentima. U svakom slučaju, poruka ovog podatka je jasna: u nastavi treba njegovati izazov i reducirati averziju. To je u skladu s rezultatom istraživanja koji pokazuje da averzija i gnjavaža nisu apsolutno u suprotnosti s interesom i pozitivnim emocijama (Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010). Dakle, poznate su nam situacije kada nastava nije zanimljiva, ali je učenici pohađaju i savladavaju programske sadržaje zato što u tom području žele napredovati, završiti školu ili imaju neki drugi motiv.

Shema 5.

Drugo, ohrabruje pokazatelj da je *produkcijско učenje* jači prediktor pozitivnih emocija ($\beta = 0,23$) nego što je *reprodukcijско učenje* prediktor negativnih emocija ($\beta = 0,13$). Kada znamo da se u školama njeguje reprodukcijско učenje i da su učenici i studenti navikli na reproduktivnost, tada je pedagoški posebno korisna spoznaja da *izazov* djeluje djelotvornije nego reprodukcijско učenje. Treba očekivati da će izazov stvarati frustraciju i nesigurnost, da je on prediktor negativnih osjećaja. Pokazalo se, ipak, da nije tako, jer su te dvije varijable u negativnoj korelaciji ($r = -0,12$; Shema 3, desni dijagram).

Treće, *izvršavanje odluka nastavnika* prediktor je negativnih osjećaja ($\beta = 0,17$), a samostalno odlučivanje nije prediktor pozitivnih osjećaja (usporedi Shemu 1 i Shemu 3). To je jasan pokazatelj nastavnicima na temelju kojeg trebaju smanjivati svoju nalagodavnu ulogu, ali moraju i osposobljavati učenike za samostalno odlučivanje. Jedno istraživanje je pokazalo da nije dobro ako u nastavi imamo previše, ali ni premalo kontrole (Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010), a drugo da optimum strukture rezultira optimumom autonomije u nastavi (Jang, Reeve, &

Deci, 2010). U našem istraživanju učenici i studenti su pokazali da odluke nastavnika izvršavaju često uz neugodne emocije. Dakle, optimalan balans između samostalnosti učenika i naloga nastavnika predstavlja orijentaciju koju bi trebalo njegovati u nastavnoj praksi.

Četvrto, korelacija između pozitivnih i negativnih osjećaja u nastavi i školskom učenju je negativna ($r = -0,20$; Shema 4), ali niska, što pokazuje da su naši učenici i studenti navikli na to da u nastavi imaju i jedne i druge osjećaje.

Potrebno je utvrditi da je dokazana hipoteza da samoregulatorna uspješnost znatno predodređuje pozitivne i negativne emocije učenika i studenata, a u okviru te uspješnosti identificirali smo komponente koje su ključne za tu predileksiju. Sve to dalo je nekoliko novih i značajnih pedagoških spoznaja kao i tema za nova istraživanja.

Zaključna rasprava

U ovom smo radu dokazali da postoje komponente samoregulacijske uspješnosti koje predodređuju pozitivne i negativne emocije učenika u nastavi. U dokazivanju te hipoteze ispostavilo se da nisu sve komponente samoregulacijske uspješnosti prediktori pozitivnih emocija. Pokazalo se da je ključan prediktor te uspješnosti *izazov* (Shema 3; $\beta = 0,51$), a uz njega i *produkcijско učenje* (Shema 3; $\beta = 0,24$). Multiplom regresijom isključene su tri varijable kao prediktori samoregulacijske uspješnosti učenika i studenata: *autonomija*, *interaktivno i kooperativno učenje* i *samostalno donošenje odluka*. Koliko god je značajno da smo otkrili ključne komponente samoregulacijske uspješnosti kao prediktore pozitivnih osjećaja u školi, toliko je značajno da smo otkrili kako su autonomija i druge komponente isključene iz te predileksije. Istraživanje Edwarda Decia i suradnika pokazalo je da autonomija učenika izravno utječe na njihovu uključenost u nastavne aktivnosti (Jang, Reeve, & Deci, 2010). U našem istraživanju autonomija je regresijom isključena kao prediktor pozitivnih emocija u nastavi. Dakle, trebalo bi razvijati nastavne modele u kojima se jača autonomija učenika. Takvi modeli su interaktivno učenje i nastava utemeljena na preuzimanju odgovornosti, te samostalno odlučivanje učenika. Upravo su interakcija, kooperativno učenje i samostalno odlučivanje varijable isključene kao prediktor pozitivnih emocija na našem uzorku. Pedagoški bi bilo vrlo atraktivno eksperimentalno testirati program koji se oslanja upravo na jačanje tih komponenti samoregulacijske uspješnosti učenika i studenata.

Kada smo u hijerarhijskoj regresiji uključili negativne emocije kao medijacijsku varijablu između komponenata samoregulacijske uspješnosti i pozitivnih emocija, prediktori pozitivnih emocija neznatno su se smanjili (Shema 3), statistički neznajčno, ali se zato korelacija između negativnih i pozitivnih emocija ($r = -0,20$, Shema 5) značajno smanjila ($\beta = -0,10$, Shema 3). To znači da će se dobro uspostavljena pozitivna klima u razredu nastojati održati usprkos negativnim emocijama, ako se pojave. Kada smo u multiploj regresiji testirali utjecaj negativnih komponenata samoregulacijske uspješnosti učenika i studenata na njihove negativne

emocije, dobili smo tri prediktora: *averziju* ($\beta = 0,24$, Shema 4), *reprodukcijско učenje* ($\beta = 0,13$, Shema 4) i *izvršavanje odluka nastavnika* ($\beta = 0,17$, Shema 4). Kada smo primijenili hijerarhijsku regresiju i uveli pozitivne emocije kao medijacijsku varijablu, ti se odnosi nisu promijenili, a pozitivni osjećaji nisu imala značajnu korelaciju s negativnima. Drugim riječima, kada se u nastavi uspostavi negativna emocionalna klima, tada tako uspostavljenu atmosferu ne mogu bitno i radikalno zamijeniti pozitivne emocije. Vjerojatno je za takvu promjenu potrebno vrijeme i niz drugih prediktora koje ovdje nismo testirali. I u ovom su modelu (Shema 4) kao prediktori negativnih osjećaja isključene varijable *ovisnost* i *izvršavanje odluka nastavnika*. To je još jedan pokazatelj da je nastavu i učenje poželjno organizirati u interakciji. Da je tako, potvrđuju i neka novija istraživanja. Istraživanje je pokazalo da učeći učenje putem interaktivnih radionica „naši učenici brzo usvajaju tehnike učenja, kao i to da je zahvaljujući uvođenju ovih tehnika porasla motiviranost za ovakav način rada“ (Suzić, 2005, str. 516). U još jednom istraživanju otkriveno je da su pozitivne emocije koje se javljaju uz motivaciju više izražene kod učenika koji pohađaju škole u kojima se izvodi interaktivna nastava nego kod učenika koji su pohađali tradicionalne škole (Stanković, 2007). Osim toga, pokazalo se da tradicionalna nastava slabo podržava samostalnost učenika i da postoji strah učenika u uvjetima kada moraju samostalno raditi i odlučivati (ibidem, str. 217). Dakle, druga istraživanja, kao i naše, pokazuju da su negativne emocije povezane s odsustvom izazova, odnosno s averzijom u nastavi, s reprodukcijским učenjem i s dominantnom ulogom nastavnika, odnosno izvršavanjem nastavnikovih naloga. Sve su to svojstva tradicionalne nastave (Suzić, 1995, str. 19) koja su se jasno iskristalizirala krajem dvadesetog stoljeća (Hirsch, 1996, str. 8), a iskustva iz prakse pokazuju da se ta svojstva mogu mijenjati u pedagoški željenom smjeru.

Na kraju treba istaći da ovo istraživanje donosi nove spoznaje o komponentama samoregulacijske uspješnosti kao prediktorima pozitivnih emocija učenika i studenata. Osim toga, ovdje je otvoreno nekoliko pitanja za dalja istraživanja i nekoliko direkcija za dalje pedagoško djelovanje, za nastavnu praksu. Ako smo nekog od istraživača ponukali na novo istraživanje i nekog od praktičara na novo sagledavanje nastavne prakse ili na novo djelovanje u toj praksi, smatramo da smo ispunili zadaću koju ovakav rad podrazumijeva.