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Self-System and Semantic Structures in Mental Regulation of Student's Psychological States

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Abstract

Self-regulation with its mental mechanisms is the key factor of the success of students educational activities, the constructiveness of behavior and mental states during the educational process. The article presents the results of the study of the student's psychological states mental regulation. According to the model, the process of regulation is a structure of relationships between mental states, characteristics of consciousness (representations, reflection, experiences, semantic structures) and external factors (situations, cultural space, lifestyle, social environment). The core regulating function in organizing the inclusion of structures of consciousness in the mental states self-regulation is performed by the self-system. The present study, in which first-year students took part, investigates the nature of the relationship between the components of the self-system (self-esteem and self-attitude) and semantic structures (the general level of meaningfulness, semantic orientations, motivation and semantic categories of meanings and values). The role of each of these consciousness structures in the effectiveness of regulatory processes in the course of various situations of the educational activity (lecture, seminar, exam), as well as in the effectiveness of the educational process, has been examined. It was revealed that students with a high level of self-esteem and positive strategies of self-attitude are characterized by a high level of meaningfulness and constructive desire to find sources of meanings in all temporal directions (future, present, past). The combination of these features contributes to effective self-regulation and, as a result, success in the educational process.

Keywords: mental regulation, mental state, self-system, semantic structure.

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Introduction

The issue of mental regulation belongs to one of the fundamental problems of psychological science. It remains the focus of domestic and foreign researchers. A deep understanding of the regulatory processes of psychological activity creates opportunities for increasing the human's adaptive abilities, which is a necessary condition for a successful life nowadays, characterized by instability and extreme conditions. Different concepts and models have been used to understand the mechanisms of mental regulation. The solution of this problem requires an integrative approach. In our opinion, the most important purpose of research is to investigate the interaction of characteristics of consciousness (representations, reflection, experiences, semantic structures) in the process of mental regulation. The phenomenon of the Self has special place among the structures of consciousness. The idea of self-consciousness as the most important sign of consciousness, its epicenter, allows us to talk about the key role of the Self in the human mental reality. The Self, as an existential core of the personality, provides its internal self-organization and self-regulation. In turn, researches show that the Self is a complex multi-level system. Thus, it assumes close interconnections of the components of the self-system with all structures of consciousness.

Purpose and objectives of the study

The purpose of the present study was to research the nature of the relationship and mechanisms of mutual influence between the components of the individual's self-system (self-esteem and self-attitude) and semantic structures (the general level of meaningfulness, semantic orientations, motivation and semantic categories of meanings and values). The next step was to investigate the role of each of these consciousness structures in the effectiveness of regulatory processes in the course of various situations of the educational activity (lecture, seminar, exam), as well as in the success of the educational process in general.

Literature review

In Russian psychology of today, a number of fundamental concepts of mental activity regulation have been created. One of the most complete structural and functional models of self-regulation was proposed by Konopkin (1995). According to the model, conscious self-regulation is a process of initiation and control of voluntary activity, the main functional components of which are the goals planning, modeling of the significant conditions, programming the actions, evaluating and correcting results. Within the framework of the structural and functional approach, Morosanova (2001) proposed a hypothesis about the influence of personality traits on regulation processes. The compound of individual characteristics and behavior modes forms an "individual style of self-regulation".

Osnitsky (2007) offered the model of regulatory experience where self-regulation appears as a structured system of knowledge, skills and experiences. The main components of this model are reflection, value-motivational experience, the experience of habitual activation, operational experience, and experience of cooperation. Reflection helps to activate the process of neutralizing the initial information uncertainty to the level that allows effective purposeful activity.

The works of many other domestic scholars (Gabdreeva, 1981; Ivannikov, 2006; Kostin & Golikov, 2014; Sergienko, 2011) are also devoted to the study of the self-regulation issues.

A wide range of approaches and views on the processes of mental regulation exist today in foreign psychology. In the social cognitive theory of self-regulation by Bandura (1991) the role of self-influence on human behavior is highlighted. The self-regulative mechanism includes three principal subfunctions: self-monitoring; judgment of one's behavior and affective self-reaction. In the model by Carver (2004) self-regulation is considered through two aspects: the control of behavior and the control of affect. Some models focus on the distinction between regulation of long-term goal behavior and immediate impulses. A dual-system perspective of impulse and self-control is proposed as a basis (Hofmann et al., 2009). The temporal self-regulation theory examines, basing on the biological roots of self-regulation, the rationality of human behavior in terms of the balance between costs and benefits in the short and long term (Hall & Fong, 2007). In the extended process model (Gross, 2015) the emotion regulation is considered as the type of valuation including three different stages (identification, selection, implementation). Some models examine the link between the personal features and emotion regulation (Segerstrom & Smith, 2019; Whiteside & Lynam, 2001). Other studies investigate the differentiation of the processes of self-regulation and self-control (Milyavskaya et al., 2019; Gillebaart, 2018). Baumeister and colleagues (2007) in their strength model of self-regulation study the role of person's willpower in the regulatory processes.

With all the advantages of the existing concepts of psychological activity regulation, the studying of mental component is the least developed. In our opinion, there is not enough research that would allow one to reveal more fully and deeply the role and contribution of the consciousness structures to regulatory processes.

A conceptual model of mental regulation of the psychological states was proposed by Prokhorov (2020). According to the author, the process of regulation represents a structure of relationships between mental states, characteristics of consciousness (representations, reflection, experiences, semantic structures that form the subjective experience) and external factors (situations, cultural space, lifestyle, social environment). The interaction of the components is represented by regulatory actions and feedback.

The core regulating function in organizing the inclusion of consciousness structures in the states self-regulation is performed by the self-system.

It should be noted that despite the significant interest of researchers in the phenomenon of the self, the content and scope of this construct are still controversial. When describing the person's self and the self-consciousness, different categories are used, referring as a rule to a certain author's theory: "identity", "self-concept", "self-image", "ego", "empirical personality", "the picture of the self" etc.

Still, according to the position of a large number of researchers, the self-system includes three main structural components: cognitive (the combination of the individual's ideas about himself and the process of self-knowledge), emotional-value (self-attitude) and behavioral (regulatory). As a self-regulation's mechanism self-consciousness controls and regulates a person's behavior and activities, through the perception of oneself and the world, own experience and external influences (Agapov, 2013; Zakharova, 1989; Sardzhveladze, 1989; Stolin, 1983; Chesnokova, 1997; Leary & Tangney, 2012; Tesser et al., 2000). Being the key structure of consciousness, the self-system provides internal self-organization and self-regulation (Prokhorov & Kartasheva, 2020). However, it is precisely the regulatory components of the self-system that have been insufficiently studied.

Another important part of the subjective (mental) experience is semantic structure. Semantic structures create the correspondence within the person and his being, fill the life with senses, ensuring the semantic acceptance of life (Prokhorov, 2020). Only after the act of personal sense formation, obtaining the significance for the person, the actual psychological situation begins to determine the individual's activity and its manifestations. In turn, certain ways of self-control and self-regulation are assigned to these connections. Their choice, actualization and manifestation depend on the semantic structures of consciousness.

A wide range of studies in both domestic and foreign psychology analyze the content and structural-organizational characteristics of values and meanings. Empirical classifications of values and semantic orientations have been developed on a variety of psychological and methodological grounds: models that differentiate values by subject, the content of objects, subject of relationship; values as a hierarchical system in accordance with possible classification models (Leont'ev, 2007); value orientations as the central personality-semantic formation (Kruglov, 1989); value orientations as regulators of a person's social behavior (Yadov et al., 2013).

Studies that reveal the structure of the relationship between the parameters of the self-system and the semantic structures of the subject will allow expanding the understanding of the mechanisms of mental states regulation.

Methodology

The study involved 52 first-year students in the field of "psychology". At the first stage of the study, student's individual features were identified: the characteristics of the self-system components, as well as the parameters of the semantic structure. At the next stage, students described their mental state and their effectiveness of self-regulation in three different situations of educational activity: lecture, seminar and exam were evaluated.

The components of the student's self-system were investigated using the following methods. To determine the global, most generalized level of self-attitude, the method "Global Differential - Me" by Gudkova (2010) was used. The participants were asked to select and evaluate the feature from each of 14 bipolar characteristics pairs, answering the question «What kind of person am I?». The methodology allows to determine three indicators: an integral indicator of the global self-attitude, and its components: cognitive (assessment of own qualities and abilities) and affective (emotional self-attitude).

The measure of more differentiated aspects of self-attitude was diagnosed using the method of self-attitude research by Pantileev (Slotina, 2008). The methodology includes nine scales defining the severity of the following internal strategies towards oneself: self-respect (scales of self-confidence, self-guidance, reflected attitude, openness); autosympathy (scales of self-worth, self-acceptance, self-attachment); self-abasement (scales of self-accusation, internal conflict).

Also, to determine self-esteem's level, students were offered a list of positive personal qualities to assess their severity on a scale from 1 to 5.

To study the student's semantic structures the following methods were used. Life-Meaning Orientation Test by Leont'ev (Slotina, 2008) includes three scales that reveal the person's "source" of life meaning: in the future (goals), present (process) or past (result); two scales of control locus: the locus of control - Me and the locus of control - life; as well as a general indicator of the meaningfulness of life.

The meaningful analysis of semantic structures was investigated using the methodology for studying the life meanings system by Kotlyakov (2003), which includes eight categories of meanings: altruistic, existential, hedonistic, self-realization, status, communicative, family, cognitive.

Terminal and instrumental classes of values were diagnosed using the method of researching value orientations by Rokich (Karelin, 2007).

Diagnoses of students type of motivation to educational activities were carried out using the methodology "Academic Motivation Scale" by Gordeeva and her colleagues (2014). The questionnaire makes it possible to assess three types of internal motivation: the severity of the motives of cognition, achievement, and self-development (improvement). Besides the questionnaire allows assessing the type of outside motivation: external (the desire to perform activities to prevent problems), introjected (caused by the frustrated need for autonomy, accompanied by the sense of duty and shame) and motivation caused by the need for self-respect.

The individual effectiveness of self-regulation was investigated using the method "The effectiveness of self-regulation" by Nazarov and Prokhorov (2018).

The received data was processed using standard features of Microsoft Office Excel 2010; SPSS 22.0, Statistika 9. To estimate the correlation the Spearman rank correlation coefficient was used.

Results

As a result of the correlation analysis of the data, the relationship between the components of the self-system and the features of the motivational-semantic sphere of the respondents was revealed.

Close relationships were found between the indicators of the self-system and the characteristics of the student's semantic orientations (Table 1). All scales characterizing self-esteem and self-attitude have significant correlations with the level of general meaningfulness of life and with all aspects of the direction of semantic orientations. Let us dwell on the nature of the relationship.

Table 1. The relationship between the indicators of the self-system and the peculiarities of the semantic orientations of students

Indicators	General meaningfulness	Semantic directions			Locus of control	
		Future (goals)	Present (process)	Past (result)	Me	Life
Indicators	Correlation coefficient					
Self-esteem of individual traits	,727[**]	,561[**]	,603[**]	,744[**]	,574[**]	,585[**]
Global self-attitude						
integral component	,678[**]	,583[**]	,722[**]	,680[**]	,554[**]	,513[**]
cognitive component	,726[**]	,639[**]	,799[**]	,704[**]	,588[**]	,608[**]

affective component	,417**	,364**	,435**	,441**	,363**	,229
Self-respect						
self-confidence	,471**	,484**	,533**	,430**	,396**	,229
self-guidance	,673**	,570**	,591**	,676**	,556**	,533**
reflected attitude	,607**	,557**	,603**	,570**	,476**	,492**
openness	,587**	,415**	,556**	,615**	,456**	,441**
Autosympathy						
self-worth	,480**	,444**	,475**	,584**	,386**	,537**
self-acceptance	,358**	,320*	,361**	,457**	,237	,323*
self-attachment	,395**	,281*	,278*	,426**	,430**	,257
Self-abasement						
internal conflict	-,636**	-,448**	-,657**	-,646**	-,530**	-,578**
self-accusation	-,681**	-,481**	-,695**	-,732**	-,544**	-,561**

Note. ** $p \leq .01$, * $p \leq .05$

A high level of self-esteem and self-attitude corresponds to a greater manifestation of all semantic orientations variants.

Respondents with high rates of positive styles of self-attitude at different levels (global, cognitive and affective components, self-respect, autosympathy) have a high level of general meaningfulness of life. At the same time, their semantic strategies have various directions. On the one hand, they tend to set goals and form future prospects, at the same time, they are satisfied with their lives in the present, perceiving the life process as interesting and emotionally rich. They also see the previously obtained results as the source of their motivation, evaluating the latest period of life as productive.

Both types of the locus of control ("I am the host of life" and "influence on one's life") also have significant positive correlations with indicators of positive self-attitude and the level of self-esteem. A positive attitude towards oneself is associated with the idea of oneself as a strong personality with sufficient freedom of choice to build one's life in accordance with own goals and ideas about its meaning. Similarly, they are convinced that it is given to a person to control their life, to freely make decisions and implement them.

The same nature of the relationship exists between semantic orientations and the level of student's self-esteem. The respondents with a high level of meaningfulness and representation of all semantic strategies highly assess their positive personal qualities.

At the other extreme are indicators of internal conflict and self-accusation. With an increase in the severity of self-abasement strategies, the meaningfulness of life decreases, as well as the desire to find motivation in the goals, process and results of one's life. The feeling of being the host of one's life, the ability to influence and control events are lost.

In the course of the experiment, the students were asked to identify personal qualities that, in their opinion, allow them to regulate and manage the mental states in the process of everyday learning. All indicators of the self-system, except for "openness", have significant correlations with the rates of such qualities as "meaningfulness" and " awareness" (Table 2).

Table 2. The relationship between the indicators of the self-system and self-assessment of levels of awareness and meaningfulness

Indicators	Meaningfulness	Awareness
	Correlation coefficient	
Self-esteem of individual traits	,804**	,795**
Global self-attitute		
integral component	,483**	,408**
cognitive component	,491**	,382**
affective component	,341*	,324*
Self-respect		
self-confidence	,381**	,427**
self-guidance	,445**	,395**
reflected attitude	,322*	,283*
openness	,257	,188
Autosympathy		
self-worth	,410**	,358**
self-acceptance	,369**	,309*
self-attachment	,215	,300*

Self-abasement		
internal conflict	-,383**	-,419**
self-accusation	-,445**	-,469**

Note. ** p ≤ .01, * p ≤ .05

In this case, the nature of the relationships has the same orientation: a high level of self-esteem and positive self-attitude in all its aspects corresponds to a high value of meaningfulness and awareness in the processes of student's mental states regulation. Whereas the respondents, who are more inherent in the strategy of self-abasement, attach less significance to meaningfulness and awareness.

As for the content composition of semantic structures, significant correlations between the parameters of the self-system and the scales characterizing the categories of life meanings have not been revealed. The peculiarities of self-attitude are not interconnected with the semantic orientation of the personality (hedonistic, existential, cognitive, communicative, status, altruistic, family, towards self-realization). The level of self-esteem is also not associated with semantic categories.

Also, a definite tendency and pronounced significance in the relationship between the components of the self-system and the value orientations of students (terminal and instrumental) were not revealed.

Another area of semantic structures that has close relationships with the indicators of the self-system is academic motivation. As shown in Figure 1, the most significant interaction was found between the characteristics of motivation and the global self-attitude, as well as such aspects as self-esteem and self-abasement. The latter seems to be opposite extremes for which different types of motivation are typical. So, the scales of motivation for cognition, achievement and self-development correlate with a high level of self-esteem, and, accordingly, with a low level of self-abasement indicators. Students with a positive self-attitude are characterized by the desire to learn new things, the experience of interest and pleasure in the process of learning, desire to achieve the highest possible results in studies, to develop their abilities and potential.
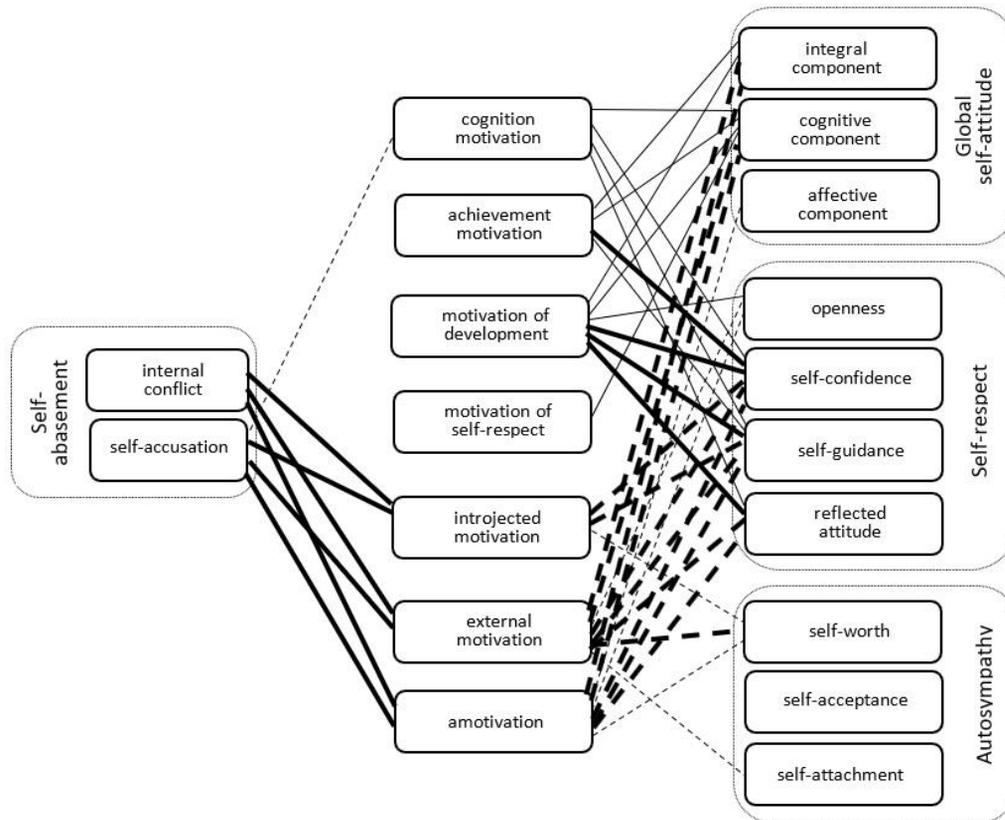
Figure 1. Correlations between the components of the self-system and types of academic motivation

The opposite view is observed for the scales introjected, external motivation and amotivation (lack of motivation): respondents with high indicators on these scales are characterized by a high level of self-abasement and insufficient self-esteem and autosympathy. The main motivational component here is a sense of shame and duty to oneself and other significant people, which makes it necessary to follow the requirements in order to avoid possible problems. At the same time, interest and a sense of meaningful learning activity are lost.

The self-esteem indicator has the same orientation of interrelations with the types of motivation: positive correlations with motivation for cognition, achievement, self-development and self-esteem, and negative correlations with introjected, external motivation and amotivation. However, a significant relationship was found only between the level of self-esteem and amotivation (r = - 0.370; p ≤ 0.01). In other cases, these connections have no reliable significance.

Concerning the motivation from the need for self-respect, no significant relationships with the characteristics of the self-system were found (except for the cognitive component of the global self-attitude, where a positive correlation was revealed). This scale expresses the desire to act for the sake of a sense of self-worth in attempts to increase self-esteem through academic achievement, it corresponds to the need for respect and self-esteem. This desire is equally characteristic of students regardless of their level of self-esteem and self-attitude strategy.

The affective component of the global self-attitude does not have significant relationships with indicators of motivation. Considering that the latter is a reflection of the implicit, deepest level of emotional attitude to oneself, it can be concluded that the processes of motivation affect at a more explicit, conscious level of mental structures.

During the analysis of the data, it was revealed that the correlations between all the characteristics of the self-system and the effectiveness of self-regulation retain their orientation in all situations of the educational activity (lecture, seminar, exam). As well as the direction of the relationship between the effectiveness of self-regulation and indicators of semantic structures. The intensity of correlations increases with the growth of the tension of the situation. Thus, the largest number of significant relationships was revealed for the situations of the seminar and exam. (Tables 3, 4)

Table 3. Correlation links between the effectiveness of self-regulation at the seminar and the components of the self-system and the semantic structure

Indicators	Correlation coefficient
Components of the self-system	
self-esteem	,407**
integral component of self-attitude	,363**
cognitive component of self-attitude	,420**
self-confidence	,380**
reflected attitude	,388**
self-accusation	-,472**
Academic motivation	
motivation for achievement	,321*
external motivation	-,351*

amotivation (lack of motivation)	-,283[*]
The level of meaningfulness	
awareness	,285[*]
meaningfulness	,319[*]
general meaningfulness of life	,331[*]
Semantic orientation	
Future (goal)	,308[*]
Present (process)	,397[**]
Past (result)	,467[**]

Note. ** $p \leq .01$, * $p \leq .05$

In general, it can be noted that the high level of self-esteem, positive strategies of self-attitude correspond to effective self-regulation in all situations of educational activity. At the same time, self-accusation leads to the deterioration of mental states regulation. A higher level of meaningfulness and awareness also correlates with the effectiveness of self-regulation, for the situation of the seminar these connections are significant (Table 3).

A high level of semantic orientations for the future (goals), present (process) and past (result) positively correlate with the effectiveness of self-regulation in the situations of exam and lecture (Table 4; 5).

Table 4. Correlation links between the effectiveness of self-regulation on the exam and the components of the self-system and semantic structure

Indicators	Correlation coefficient
Components of the self-system	
integral component of self-attitude	,352[*]
affective component of self-attitude	,325[*]
self-confidence	,381[**]
reflected attitude	,382[**]
self-accusation	-,310[*]

Semantic orientation	
present (process)	,297[*]
Semantic category	
self-realization	,307[*]
Instrumental value	
tolerance	,298[*]
efficiency in activity	,293[*]

Note. ** $p \leq .01$, * $p \leq .05$

Self-regulation is facilitated by such type of motivation as achievement motivation. External motivation and amotivation have negative correlations with the level of self-regulation efficiency in all situations of the educational process, in the conditions of a seminar and lecture the correlations are significant (Table 3; 5).

Table 5. Correlation links between the effectiveness of self-regulation at the lecture and the components of the self-system and semantic structure

Indicators	**Correlation coefficient**
Components of the self-system	
self-accusation	-,316[*]
Academic motivation	
external motivation	-,412[**]
amotivation (lack of motivation)	-,275[*]
Instrumental value	
strong will	-,307*
tolerance	,348*

Note. ** p ≤ .01, * p ≤ .05

As for the content aspects of semantic structures, their relationship with the effectiveness of self-regulation is negligible. A significant direct correlation was found between the indicator of focus on self-realization and the self-regulation's level at the exam. Also, the effectiveness of self-regulation in the situation of the exam correlates with such instrumental values as "tolerance" and "efficiency in activity". Such quality as tolerance for the views and opinions of others, the ability to forgive others for their mistakes and delusions, contributes to a flexible attitude towards oneself and others and helps to adapt in any situation. In the situation of the lecture, the instrumental value "strong will", expressing the ability to insist on one's own, not to retreat in the face of difficulties, negatively correlates with the success of self-regulation. This can be explained by the fact that the excessive persistence of a person causes tension and leads to an inability to relax and regulate own mental state.

In our opinion, it could be exponential to consider the relationships between the components of the self-system and the semantic structure and the estimated score received for the exam, as an indicator of the efficiency of the students' mental regulation of psychological states (Table 6).

Table 6. Correlation links between the score received for the exam and the components of the self-system and the semantic structure

Indicators	Correlation coefficient
Components of the self-system	
internal conflict	-,333*
Instrumental value	
tolerance	,292*
efficiency in activity	,305*
Effectiveness of self-regulation	,491**

Note. ** p ≤ .01, * p ≤ .05

The indicator of the effectiveness of self-regulation has a direct significant correlation with the score obtained

for the exam. This points out the undoubted importance of the mental regulation processes for the success of students' educational activities. This allows us to conclude that all the features of self-esteem, self-attitude, motivation and semantic structures that contribute to effective self-regulation are also important for the efficiency of students. And vice versa, low self-esteem, negative strategies of attitude towards oneself, low level of meaningfulness and imposed motivation, reduce the effectiveness of the educational process.

Discussion

The results of the research confirmed the assumptions about the existence of significant relationships between the components of the self-system and the semantic structures of the personality.

Close correlations were revealed between the characteristics of the self-system and the general level of meaningfulness of life, as well as with the parameters of semantic structures in terms of its regulation and organization function. Self-esteem and positive self-attitude of students correlate with a high level of meaningfulness and awareness. They are distinguished by a sense of their own conscious control over current events and an idea of themselves as the host of their lives. Also, students with a high level of self-esteem and self-attitude are characterized by a constructive desire to find sources of meaning in all temporal directions (future, present, past).

Students with high self-esteem, who treat themselves with respect and sympathy, are motivated by the desire for knowledge, achievement and self-development. Introjected, external motivation and amotivation (lack of motivation), accompanied by a feeling of shame and compelled necessity, loss of interest and meaningfulness, are characteristic of students inclined to strategies of humiliation towards themselves (self-accusation, interior conflict).

Concerning the peculiarities of the content composition of the meanings and values of students, no significant relationships with the components of the self-system have been revealed.

In turn, each of these structures of consciousness: the self-system and semantic components, is associated with the general level of self-regulation efficiency in various conditions of the educational process. These relationships also have specific trends. More effective processes of mental regulation are demonstrated by students with a high level of self-attitude and meaningfulness of life. Effective self-regulation is facilitated by intrinsic motivation to achieve, while the predominance of externally imposed motivation and its absence are associated with the deterioration of regulatory processes.

The result of students' educational activities, expressed in the score obtained on the exam, has a direct

significant relationship with the level of self-regulation efficiency. Thus, all conclusions about the nature of the relationship between the components of the self-system, semantic structures and the effectiveness of self-regulation can be applied to the final success of the educational process. Positive self-attitude and self-esteem, a high level of meaningfulness and awareness, internal motivation aimed at achievement and self-development, contribute to the high efficiency of students.

Conclusion

All components of the self-system are intensively associated with the parameters of semantic structures in the part related to the regulation and organization of semantic space, the features of strategies and mechanisms of the person's sense-making. In turn, all components of the self-system influence the effectiveness of self-regulation and the efficiency of activities. In this, in our opinion, the position on the self-system regulatory function finds confirmation. The self-system, being the central component of subjective (mental experience), an integrative complex, plays a key role in the mental regulation of psychological states. Elements of all self-system levels in interaction with semantic components create a structure of consciousness that determines the emergence and change of mental states, forms and activates behavior patterns in the process of mental states regulation.

Practical application of the research consists in the development of a methodology that supports the increase of the regulatory and adaptive abilities of students, and in general, the effectiveness of the educational process.

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