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The Impact of Academic Motivation, School Anxiety and Self-Reflective Awareness on the Experience of High School Students' Cognitive States

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Abstract

The problem of impact of academic motivation, school anxiety and self-reflective awareness on the experience of cognitive states is relevant due to the need to create specific conditions while teaching at schools or in higher education institutions. These conditions should contribute to students experiencing cognitive states and encourage successful absorption of new information. The purpose of this article is to describe the results of the empirical study by showing interrelation between the psychological characteristics of high school students and also, by taking into account their gender differences. Methods of testing and questionnaires were used in the study. The results indicate the existence of certain general psychological mechanisms for the regulation of cognitive states. Moreover, these mechanisms are different for adolescent boys and girls. The results can be useful in developing curricula and approaches to effective teaching of academic material.

Key words: cognitive state, academic motivation, self-reflective awareness, school anxiety, interrelation, high school student, adolescent boy, adolescent girl.

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Introduction

The task of controlling the quality and quantity of new information offered to high school or university students in classes continues to attract the attention of many representatives of the psychological and pedagogical community. The curriculum is being developed and improved, various criteria are considered to optimize the learning environment in order to maintain physical and mental health of students who need to learn a vast amount of knowledge. At the same time, it is very important to know how well students understand and remember the taught educational material, and what factors influence the quality of learning new information.

Current professional requirements expect from young people to be successfully adapted in the modern world in which huge amounts of information of different quality became available due to the Internet resources. Now it is difficult to imagine a high school or a university student who does not have computer literacy. The learning process includes the assimilation of new knowledge directly in the classroom, through independent work with textbooks and the use of Internet resources. While looking for useful knowledge necessary for successful study, a student can be immersed in the Internet environment and acquire a lot of useless, and, sometimes, dangerous information. Some students face a lot of temptations and illusions, lose time and, as a result, are poorly prepared for the next academic lesson, or lose all interest to study.

Since the volume and complexity of the disciplines increased in the process of study, the risk of experiencing informational stress, along with the enhancing requirements for the quality of mastering much knowledge over fairly short periods of time, also significantly increased compared with the past century. Independent work with Internet sources can raise dramatically the risk of overwork and information glut. That is why the importance of conducting classes directly at school is beyond doubt.

Classes can be very diverse. They are united by the fact that in this case there is always a direct communication with both a teacher and fellow students. In addition, the ability of students to pay attention to extraneous information from the Internet is reduced to a minimum. But it is not difficult to guess that without experiencing certain mental states that contribute to successful learning it is impossible to achieve the desired result - educate a healthy and intellectually developed person who is able to withstand competition in the chosen profession.

A scientific approach to development of modern methods of teaching academic disciplines involves the study of general psychological mechanisms in order to ensure students have an interest in learning. There is a constant process of searching and developing new psychological and pedagogical methods, which allow high school and university students to increase academic motivation and willingness to expend additional internal resources for the fullest mastering of the curriculum. At the same time, the problem of informational and emotional overloads is becoming more significant in the light of current trends during society development.

Thus, the development of curricula is extremely relevant because it makes possible to combine the enhanced information loads and the improvement of psychological and physical health in the educational process.

Literature review

Among the numerous individual psychological characteristics, it is possible to distinguish those that are undoubtedly significant in the process of full-fledged training both at school and at university. These include various aspects of academic motivation, indicators of anxiety associated with the study process, self-reflective awareness and a number of cognitive states experienced by students directly in study process in the context of various learning situations.

Various aspects of academic motivation characteristics are described by a large number of scientists (Meece & Agger, 2018; Conley, 2012; Flaviu, Carolyn, Georgeta, & Monica, 2016). Indicators of motivation for learning activities have been studied in Russia for a long time, for instance, in the research by Leontev (2016). Gerbachevsky (1970) proposes to consider several types of motives that hinder or contribute to the achievement of a result in solving problems and a number of psychological characteristics associated with these motives. Specifically, the leading motives of the academic activities, according to Gerbachevsky (1970), include: internal motive, cognitive motive, avoidance motive, competitive motive, motive to the change of current activity, self-esteem motive. In general, an analysis of the content of numerous articles devoted to the problem of academic motivation shows that motivation of university students is studied much more often than that of high school students.

Along with the research of motivation as such, there are numerous studies in which interrelations between various indicators of academic motivation and other individual psychological characteristics are traced. In particular,

studies of the interrelation between characteristics of academic motivation and anxiety (Chauhan, 2016), as well as between motivation and self-reflective awareness (Tikhomirova & Kochetkov, 2018; Karpov, 2003; Prokhorov, 2017).

Anxiety, as an individual psychological personality trait, occupies a special place in psychological research. A high level of anxiety is regarded as a subjective unfavorable personal trait. The great interest among psychologists and teachers is aroused to the phenomenon of school anxiety related with studying and finding student in an educational institution (Miklyaeva, 2004). The method of diagnosing school anxiety by Phillips (1978) is often used to measure the severity of various indicators of school anxiety.

Scientists who describe various aspects of reflection as a process and self-reflective awareness, as a personality trait, emphasize the need to integrate the components of reflection into an entire system that includes interdependent individual psychological characteristics in the context of various situations of human activity (Karpov, 2004; Karpov, 2005). We can also mention the position of Fakhrutdinova (2008), who, in turn, referring to a number of well-known representatives of scientific psychology, focuses on the fact that reflection and experience are of a qualitatively different nature, but they constitute a system complex in which the components of the complex interact with each other.

Karpov (2004) proposes to distinguish at least 4 types of reflection - retrospective (reflection of past experience), reflection of current activities, reflection of future activities and reflection of communication with other people. During the study of the reflective mechanisms, Prokhorov and Chernov (2015) described three stages of the reflective act formation. At the beginning (the first stage), the object of reflection is recognized. The object can be both their own experiences, feelings, thoughts and emotions, as well as external events, relationships with other people. Further (second stage) awareness occurs. A person can describe with words what he thought and felt in connection with a recognized phenomenon. And finally (third stage), identification occurs. There is a reference of information being perceived and under conscious awareness with information which is already in the memory of the subject, making up his life experience.

Thus, we see that the process of reflection itself has extension and step-by-step development, and, in addition, various types of reflection can be distinguished, depending on what phenomenon the awareness is directed to.

Cognitive states, as one of the varieties of mental states, were studied by Prokhorov (2012) and his colleagues in the framework of the concept of mental states self-regulation.

As a result of a numerous studies, Prokhorov and Yusupov (2015) offered a list of the most frequently mentioned by students cognitive states during various study situations.

Purpose and objectives of the study

Creation of special conditions during classes at school or university that contribute to students experiencing the cognitive states necessary for the successful assimilation of knowledge is an important task. The process of acquiring information in a classroom in connection with the individualized student's psychological characteristics, that are currently updated, is a common experience of a particular learning situation. Since the psychological well-being of students is influenced by many factors, it does not make sense to consider cognitive states that are largely dependent on the special learning situation, apart from more stable psychological characteristics.

Despite the fact that quite many researches described concerning various aspects of academic motivation, school anxiety, self-reflective awareness and cognitive states, we have not found a single work that considers the relationship between all these indicators at the same time. Meanwhile, it is completely obvious that without knowing the peculiarities of interrelation structure of personal individual psychological characteristics, involved in educational process, without understanding the mechanisms and patterns of various psychological indicators mutual influence, it is impossible to develop approaches adequate to modern educational conditions.

The purpose of our study was to identify the features of the relationship structure between characteristics of academic motivation, self-reflective awareness, school anxiety and cognitive states in high school male and female students.

The hypothesis was made by assumption that there are significant differences in the structure of interrelations between the studied characteristics of adolescent boys and girls.

Methodology

The study involved high school students of eleventh grade - 26 boys and 28 girls. They had a psychological testing and filled out a questionnaire in which eleven different cognitive states were listed. Students were asked to note

	6			.60	.60		0.57		0.46			
	7				.60		0.43		0.57			
	8							.40			.47	
	9										.39	
	0								.49	.41		
	3											.51
		Pearson' linear correlation coefficient:		$r \geq 0,39$			$r \geq 0,50$			$r \geq 0,61$		
		Significance:		$P \leq 0,05$			$P \leq 0,01$			$P \leq 0,001$		

Analysis of the data obtained allows us to notice, firstly, the presence of interrelations between all cognitive states in boys, while in girls one state of daydreaming has no relation with another set of states. Fantasy, as a state of immersion in fantasies, not related to the educational process, is not a positive cognitive state. Secondly, a lot of interrelations between the states indicate a relatively stable system of experiences, in which a slight change in one parameter will necessarily lead to an “attempt” by the system to compensate the change and restore the former general state.

Table 2

The structure of the interrelations between cognitive states of adolescent girls

		Cognitive states										
		5	6	7	8	9	0	1	2	3	4	5
Cognitive states	5		.38				0.39	0.49	0.63	0.64		.42
	6								0.48	0.54	.48	
	7				.46							.61
	8							0.39	0.44	0.38	.39	
	0							.60	.39	.42		
	1								.63	.69		
	2									.66	0.41	
		Pearson' linear correlation coefficient:		$r \geq 0,37$			$r \geq 0,48$			$r \geq 0,59$		
		Significance:		$P \leq 0,05$			$P \leq 0,01$			$P \leq 0,001$		

It can be noted that boys have a stable structure of interrelations between cognitive states that contribute to the assimilation of new knowledge (joy, inspiration, thoughtfulness, curiosity and concentration). Girls have the most stable structure of interrelations between the states that interfere with the acquisition of knowledge (irresponsiveness, absent-mindedness, boredom, doubt).

The relationship between academic motivation, reflection, school anxiety and cognitive states in boys and girls are reflected in Tables 3 and 4.

Table 3

The structure of interrelations between cognitive states and indicators of academic motivation, reflection and school anxiety in boys

		Cognitive states										
		5	6	7	8	9	0	1	2	3	4	5
AM			.41				0.49		0.57			
						.48					.61	.50
												0.47
			0.42			.43	.57		.58	.47		.49
		.41	.53	.52	.53							
RFP		.45	.45	.50			0.44					
						0.41	0.40	0.46				
	0		.41	.49								
	1						0.42					
	2		.44									
RF	4					0.49						
SA	7					.62				.60	.40	
	9	0.49	0.40	0.39			.49					
	0			0.41								
	1					.58				.56		
	2					.47				.39		
	3					.57				.47		
	4			0.40			.49					
Pearson' linear correlation coefficient:		r ≥ 0,39			r ≥ 0,50			r ≥ 0,61				
Significance:		P ≤ 0,05			P ≤ 0,01			P ≤ 0,001				

AM - academic motivation, RFP - reflective processes, RF - reflection, SA- school anxiety

The motives for changing activities (5) and self-esteem (6) are very important in the system of “motivation - cognitive states”. Actualizing the motive for changing activities reduces the experience of inspiration and enhances the experiences of irresponsiveness to the learning process, boredom, daydreaming, doubt and mental stress. The actualization of the motive of self-respect, on the contrary, enhances the experiences of joy, inspiration, thoughtfulness, and curiosity. In girls, the motive for changing activities is also the most significant, in comparison with other motives in

3							.44					
4	0.44							.50	.41	0.44		
Pearson' linear correlation coefficient:		$r \geq 0,37$			$r \geq 0,48$			$r \geq 0,59$				
Significance:		$P \leq 0,05$			$P \leq 0,01$			$P \leq 0,001$				

AM - academic motivation, RFP - reflective processes, RF - reflection, SA- school anxiety

The process of reflection, as a way of awareness of one’s experiences, phenomena of the external world, relationships with other people, is necessary in a learning situation. Developed self-reflective awareness is a characteristic of a mature personality. The results of our study showed that the process of reflection and its quality are significantly different for boys and girls.

In boys, the deceleration of the reflection process of the inner world at all three stages (7, 9, 11) leads to increased experience of irresponsiveness to new information. The intensification of the reflection process of the external world at the stages of awareness and identification (10,12) enhances the experiences of inspiration and thoughtfulness. Reducing the reflection of activity (14) at the time of testing leads to an increase in daydreaming. In girls, the deceleration of the reflection process of the inner world at all three stages leads to decrease in the experience of joy. In general, there is no direct connection between the characteristics of reflection and states of thoughtfulness and inspiration. Deceleration the process of awareness of the external world (10) enhances the experience of irresponsiveness, absent-mindedness and boredom. Unlike boys, whose reflection of activity at the time of testing (14) was directly related only to the state of daydreaming, girls’ experience of joy at the time of testing is directly related to the reflection of activity at the time of testing and reflection of interaction with other people (16). Reflection of future activities (15) is also associated with joy, but only indirectly, through experiencing mental stress. That is, the actualization of the reflection of future activities leads to experiencing mental stress, which, in turn, enhances the feeling of joy.

The analysis of the interrelations between indicators of school anxiety and cognitive states also demonstrates interesting results. It can be noted that the indicators of school anxiety in the group of girls have a much greater influence on the experience of cognitive states than in the group of boys. Actualization of girls’ general anxiety in school (17), experiences of social stress (18), frustration of the need for success (19), fear of self-expression (20), fear of not meeting the expectations of others (22), fears in relationships with teachers (24) reduce the level of joy derived from the educational process. In boys, the feeling of joy diminishes only when frustration increases the need for success.

In girls, none of the indicators of school anxiety is not associated with the experience of daydreaming. In boys, daydreaming and experiencing doubts increase when it is increased their general anxiety (17), increased fear of the knowledge evaluation situation (21), and fear of not meeting the expectations of others (22), when there is a low physiological resistance to stress (23). In girls, low immunity to stress leads to an increase of irresponsiveness to new information.

Discussions

It should be noted that the situation in which high school students were located cannot be called academic in the full sense, since they did not receive any new information during psychological testing. But, on the other hand, the study was conducted on the school's territory during the lesson and in the presence of the teacher. Thus, the structure of the interrelations between cognitive states may look different if students really need to understand and remember new information. Nevertheless, we believe that the cognitive states will be closely interconnected in each learning situation, creating a general background of the mental state during the study. In addition, we assume that there are certain mechanisms for influencing sufficiently constant personal characteristics, such as motivation, self-reflective awareness, and school anxiety, on an integral system of cognitive states in any particular situation related to learning process.

As we expected, significant differences were found in the structure of the interrelations between all the studied personal characteristics and cognitive states. This demonstrates the need to develop approaches that contribute to the intensification of positive cognitive states that help to acquire new material, taking into account student’s gender. As noted earlier, the extensive amount of articles devoted to motivation of learning activities concern students. Indeed, school students, probably, have not strongly marked structure of motivation, since they are obliged to attend school. They

enter a higher educational institution voluntarily and their choice of one or another professional orientation is already conditioned by a certain motivation.

But, since it is the school that gives basic knowledge of various disciplines, and at school the skill of mastering a wide range of knowledge is formed, it is necessary to actualize the motives of many students which contribute to full-fledged learning - internal motive (personal interest in learning), cognitive motive (interest in new knowledge), competitive motive (desire to do better in school), motive of self-esteem (desire to do better in school in order to increase one's self-esteem).

From the results of the study it is clear that among school students in a situation of psychological testing, the motive for changing activities is closely related to cognitive states. That is, the general mental state in a class, as a set of cognitive states, depends on the desire of a student to carry out educational activities. Both for boys and girls, the less marked the motive for changing activities, the higher they experience the joy of the learning process.

Hence the conclusion is quite obvious - we must strive to cultivate a desire to study through the actualization of useful motives. For school students who have difficulties in learning, it is the motive for changing activities that is sufficiently marked and encourages them to attend school badly, not to do homework, not to be interested in what the teachers are giving.

The motive of avoidance is not a positive motive, since it does not contribute to the student's voluntary and joyful learning at school. This motive encourages learning from the fear of conflict with parents, the fear of punishment for bad grades. For boys, this motive is one of the leading, while in girls it is not built into the system of cognitive states.

Both for boys and girls in a situation of psychological testing all stages of the reflection process of their inner world were included in the system "reflection - cognitive states". This is not surprising, since the psychological tests and questionnaires themselves lead to an analysis of one's own thoughts, feelings, and memories. But, girls, unlike boys, have a resource that helps them to experience more joy during classes - this is a reflection of future activities and a reflection of communication with other people. We can say that girls have the opportunity to restore a sense of joy in the process of study due to the intensification of self-reflective awareness, but this mechanism was not found in boys.

There are significant differences in the structure of relationships and between indicators of school anxiety and cognitive states. While in girls, the joy of the learning process increases, given the low level of almost all indicators of anxiety, in boys only the frustration of the need for success directly affects the state of joy. The less they hope for success in school, the less marked the experience of joy in the framework of the educational process. Unlike girls, a high level of anxiety in many respects leads to an increase in the state of daydreaming. At the same time, an increase in general anxiety in boys leads to a decrease in the experience of thoughtfulness; in girls, this again leads to a decrease in the levels of joyful perception of the educational process.

Conclusion

As a result of the research described in this article, we have seen how closely the personal characteristics of boys and girls are interconnected with the system of cognitive states emerging in the framework of a given situation of educational activity. Of course, a large number of interrelations between all the psychological characteristics studied by us, both among boys and girls, shows that it is quite difficult to change an already existing attitude to learning of a high school student. In this case, an integrated approach is needed, which includes both measures to reduce school anxiety, and the correct motivation and development of self-reflexive awareness. We have shown that for boys and girls such an integrated approach should have its own characteristics related to gender differences. Of course, this study should have its prolongation. There is a need to consider different learning situations, conduct similar research with university students and make a comparative analysis of the results in order to more fully understand the scale of the task of developing exclusive approaches that contribute to improving the quality of education, taking into account gender of students.

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