

MENTAL LOAD AND LEVEL OF MENTAL WORKING CAPACITY OF SENIOR GRADUATES IN CONDITIONS OF SPECIALIZED EDUCATION

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Abstract. *This article proposes a theoretical justification of mental stress influence on the mental working capacity of high school students in the context of specialized education. In addition, this article proposes an empirical-experimental study of functional criteria for assessing the mental working capacity of high school students in the context of educational activities. The modernization of society, the economy, politics, and modern education provides an opportunity for the emergence of a new direction of specialized education – based on objective methods of functional psychological and pedagogical diagnostics, stimulating the learning activities of students. In this regard, before psychologists and teachers, the administration of municipal educational institutions, it became necessary to determine effective criteria and methods for assessing the quality of specialized training at all stages of training and education of the main subjects of the educational process.*

Keyword: *mental working capacity, functional state, professional self-determination, specialized training, criteria-based assessment, students.*

In the conditions of modern specialized training, the majority of activity subjects (students and teachers) are under the influence of extreme mental stress.

The term "mental stress" is widely used by scientists, specialists, and practitioners in the framework of educational activities. Now there is not a single serious scientific monograph on the problems of educational activity, development and formation of the student's personality, wherever this term is used. However, there are no specific psychological and pedagogical researches that highlight the phenomenon of mental stress in conditions of educational activities in the context of a special subject of research. It can be stated that the concept of "mental stress", as well as a number of other synonymic concepts (psychophysiological load, neuropsychic load, psycho-emotional load, overload), are included in the conceptual unit of modern education, but have not received a strict theoretical and scientific-experimental development yet. This situation is largely because the problem under consideration is only beginning to for-

mulate methodologically to an independent research direction in the theoretical and applied fields of psychology.

In our understanding, mental stress is an arbitrary process of cooperation between external conditions (environmental, behavioral, situational) i.e. objective load requirements and internal conditions (functions, states, properties) i.e. subjective manifestations that mobilize or induce a person's personality to a certain purposeful activity [5].

The ongoing modernization of the school educational system requires more and more introduction of new knowledge, more information, new technologies in the student's educational process. The world torn in the child's head on facts, hypotheses, theories, laws, concepts. That are often poorly connected with each other and not having any meaning for him. Therefore, today's educational content trouble in its dissociation, fragmentary, objectivity (in academic sense). A huge array of special information mainly includes mechanical short-term memory and does not put information into long-term

memory, does not form creative abilities, affects the quality of education, having a negative impact on children's health. At the same time, both practicing subject teachers and scientific experts indicate that a load on the child's psyche also forms a certain style of personal growth. Gifted and plodding children learn the education material for more time, developing mentally, to the detriment of physical development. Children who are not interested in the subject of instruction are in a passive pastime. In the first and second cases, children do not receive any satisfaction from training sessions. According to Kaznacheev VP, the increase in pressor syndromes goes from here, for example, in modern schools with a standardized education system [6].

Even this content of education could have a direct positive impact on the upbringing and development of the student, could be learned with less self-effort if only two components (knowledge and methods of activity) were realized through the lesson, as is most often the case in practice, but and the third is the experience of value relationships. The internal conflicts that arise in the development of such content, in the best case, result in "unmotivated" protests, riots (and this is really better for the child), in the worst case, they are driven inside and cause numerous neuroses. These constituent features of a person's educational activity, for their part, determine the tension of certain mental functions, as well as the significance of certain psychological qualities, specialized feelings, and skills in its implementation.

The increase in mental stress in school makes high requirements to the body and mind of the child. Long-term high information loads affect the mental working capacity of the student; their intensity during the school year is especially high in the conditions of specialized education and is aggravated against the background of physical inactivity, significant nervous and emotional stress, and adverse environmental conditions. Therefore, a comprehensive assessment of mental working capacity is necessary. It is important to determine the diagnostic criteria for changing level of working capacity under the influence of mental stress at different periods of ontogenesis, especially in older ado-

lescents, which are characterized by the stress of many functional systems and regulatory mechanisms, and the limited ability to adapt to changes in the external and internal environment.

The purpose of the study is to reveal diagnostic criteria for the influence of mental stress on the mental working capacity of high school students studying in specialized classes.

Methods and organization. Evaluation of the subsequent mental stress influence on the functional state and level of mental working capacity of high school students in the system of specialized education is difficult and not objective to analyze using test methods. Therefore, as a method for determining the functional state of the central nervous system of students, we used chronoreflexometry, which is based on a statistical analysis of the latent periods of a simple sensorimotor reaction (SSR). The variational characteristics of the motor reaction temporal parameters reflect the probabilistic-statistical principle of the brain [1].

We used the technique "Express diagnostics of the functional state and human performance" developed by IMATON, St. Petersburg [Moroz M.P., 2003]. Our studies were attended by 87 students of 11th grade (41 boys, 46 girls), aged 16-17, studying in various specialized classes of schools in Surgut.

A survey was carried out in a separate laboratory, without the presence of persons not directly involved in the survey. The relative simplicity of this technique, the convenience of its use in natural conditions, the practical absence of the training factor influence make it possible to use it as an express method in applied research to evaluate the functional state of a person. We determined all functional values for the left and right hands, and then calculated the averaged values [3].

The shape of the distribution of successive SSR time values and the position of the variational curve in the coordinate system varies by the nervous system (CNS). This correspondence allows us to determine three quantitative criteria characterizing theoretically different sides of the functional state of the central nervous system, as well as working capacity levels from different sides [3]. The

first criterion is the functional system level (FSL) its value is mainly determined by the absolute values of the SSR. The second criterion is the reaction stability (RS). The magnitude of this indicator the more then less the variability of the values of SSR. Since the variety of SSR values is associated with continuous fluctuations of the central nervous system. The third criterion is the functional capabilities level (FCL), it is the most complete characteristic of the central nervous system state and allows one to judge its ability to

form and maintain a corresponding functional system for a long time [2, 4].

Results and its discussion. Indicators of variational chronoreflexometry of 11th grade students in Surgut (table), both boys and girls, indicated a predominance of the initial state of fatigue, in which there is a deterioration in the time and accuracy parameters of activity. Significant differences in the indices of variational chronoreflexometry in the examined groups (boys, girls) were not observed.

Table 1.

Indicators	Groups	
	Boys n=41	Girls n=46
SSR	280,32±3,95	286,15±4,51
FSL	2,63±0,02	2,62±0,03
RS	1,45±0,08	1,37±0,07
FCL	2,72±0,09	2,63±0,09

In more detail, we analyzed indicators of the RS criterion by which health levels are identified [3]

The obtained data by the criterion of reaction stability, boys had the highest percentage of reactions – 60.98% – is at a slightly reduced level of working capacity, 20.02% – at a reduced level and 19.00% – at a normal level of working capacity. Accordingly, for girls – 58.70% – a slightly reduced level of working capacity, 28.26% – at a reduced level and 13.04% – at a normal level of working capacity, respectively.

When interpreting these indicators, we can say that the functional state of students in both boys and girls is at the initial stages of the development of fatigue and under the influence of mental stress [7].

Conclusion. Specialized education, training of students is a process of continuous informed diagnostic and prognostic tracking of

changes in the educational activities of high school students in order to include the results of observations in the management of their professional development and self-determination in a municipal educational institution.

Evaluation of professional self-determination and the formation of the educational process main subjects based on significant diagnostic criteria for the functional state and mental working capacity of high school students is necessary and significant in a modern school. It allows us to determine not only the level of mental performance of students, but is also one of the essential components in the design of specialized school education, and also determines the personal and motivational choice of students for their future profession, career, interest and satisfaction in educational activities.

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УМСТВЕННАЯ НАГРУЗКА И УРОВЕНЬ УМСТВЕННОЙ РАБОТОСПОСОБНОСТИ ВЫПУСКНИКОВ СТАРШИХ КУРСОВ В УСЛОВИЯХ ПРОФИЛЬНОГО ОБУЧЕНИЯ

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***Аннотация.** В данной статье предлагается теоретическое обоснование влияния психического стресса на умственную работоспособность старшеклассников в условиях профильного обучения. Кроме того, в данной статье предлагается эмпирически-экспериментальное исследование функциональных критериев оценки умственной работоспособности старшеклассников в контексте учебной деятельности. Модернизация общества, экономики, политики и современного образования дает возможность для возникновения нового направления специализированного образования - основанного на объективных методах функциональной психолого-педагогической диагностики, стимулирующей учебную деятельность студентов. В связи с этим перед психологами и педагогами, администрацией муниципальных образовательных учреждений возникла необходимость определения эффективных критериев и методов оценки качества специализированной подготовки на всех этапах обучения и воспитания основных субъектов образовательного процесса.*

***Ключевые слова:** умственная работоспособность, функциональное состояние, профессиональное самоопределение, специализированное обучение, критериальная оценка, студенты.*