

PROFESSIONALLY SIGNIFICANT PSYCHOPHYSIOLOGICAL QUALITIES OF INFORMATION LOGICAL GROUP OF SPECIALTIES AT IMPLEMENTATION OF THE EXPERIMENTAL PROGRAM OF PROFESSIONALLY APPLIED PHYSICAL TRAINING OF STUDENTS

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Annotation: *Purpose:* to improve vocational and applied physical training of students of economics. *Material:* the pedagogical study involved 72 male students (aged 19-20 years). *Results:* job study was conducted. Defined professionally significant neurobehavioral performance of students of information logical group. Matched professionally applied exercises for their development. The results showed that in the process of purposeful muscle activity improved mechanisms of regulation of neural processes, adaptive changes occur that affect the temporal parameters of sensorimotor motor responses. A comparative analysis of the psychophysiological indicators of students of the control and experimental groups was done. *Conclusions:* it was found that matched professionally applied exercises positively affect the development of psycho-physiological qualities of students information and logical group of specialties.

Key words: *students, professionally, significant, qualities, applied, physical, training.*

Introduction

Progress of modern society is characterized by wide and intensive implementation of information computer technologies in different spheres of human activity. Future specialist shall be skillful in using personal computer. Work in Internet permits to obtain full information from different spheres of human activity [9] on governmental level. In law of Ukraine "On main principles of development of information society in Ukraine for 2007-2015" it is formulated that one of strategic direction of society's development in state is provision of every person with opportunity for acquiring of knowledge, skills and information-communicative technologies during studying and vocational training [Law of Ukraine. On main principles of development of information society in Ukraine for 2007-2015. No. 535-V, dt. 09.01.2007].

At the same time there are problems, implying that modern period of world economic's development is characterized by sharp aggravation of contradiction between requirements to intensification of all forms of public production, dictated by market relations and psycho-physical abilities of engaged in it professionals. Demand in solution of existing situation makes development and implementation on all stages of professionals' formation of all efficient means of ensuring of specialists' physical reliability and readiness for active life functioning and highly productive work on chosen specialty extremely urgent. The highest effect in this respect, as it is proved by special researches, can result from professional-applied physical training (PAPT) [15].

V.A. Kabachkov and S.A. Poliyevsliy characterize this direction as specialized pedagogic process with prevailing using of means and methods of physical education, which ensure to optimal extent progressing and perfection of functional and motion human abilities, required for certain kinds of labor and military functioning [8].

Just development of professionally significant qualities ensures professional potential of future specialist.

In different periods of time the problem of determination of professionally important economist's psycho-physiological qualities was paid attention by experienced specialists N.I. Falkova, 2002; D.O. Yegorichev, 1998; S.I. Kirichenko, 1998; N.I. tonkov, 1999; Ye.R. Parniugina, 2004; N.I. Zavidivska, 2008; S.V. Khalaydzhi, 2006; L.P. Pilipey, 2011; O.M. Boltenkova, 2012.

These researches point that for successful solution of professional readiness tasks future specialists of information-logic group of specialties shall have such professionally significant features, which include: long-term digital and logic memory and mobility of nervous processes, concentration and volume of attention, preciseness of hands and fingers' movements, coordination of hands and fingers.

In literature there is information about peculiarities of psycho-physiological functions' formation in ontogeny, about properties of nervous processes and their connection with senso-motor response, considering character of professional activity [10-12].

Demand in enriching of psycho-motor resources on every stage of evolution is mentioned in scientific works by N.A. Bernstein; he writes about increasing demand in single, not trained motion responses, coordination fitness to quick solution of sudden motion tasks [1].

Researches of A.O. Navakatikian [12] elucidate that development of senso-motor responses, dexterity of movements, concentration of attention, different kinds of memory influence positively on mental workability.

Distinctive feature of student's age (both of boys and girls) is peculiarities of brain mechanisms' adaptation to mental functioning, which has not formed yet. This is why it is important to correctly organize and plan teaching work and content of physical education, because stability and activity of such indicators of mental functioning as memory, attention, perception, quickness of information transmitting are in direct connection with level of physical fitness.

Different mental functions often depend on such definite physical qualities and abilities (quickness, strength and endurance). So these qualities could be trained [3].

From physiological point of view as a result of targeted physical training latent period of reflexes shortens, mobility of nervous processes increases, inductive period of excitation and inhibition shortens, transition from one reflexes to other perfects, formation of conditional reflexes accelerates, mobility of motion and vegetative reflexes improves, nervous system's functions develop and improve. These result in progressing of organism's fitness [4].

That is why, during primary medical examination of students we measured such psycho-physiological indicators as latent period of simple visual response (LP SVMR), latent period of visual-motor response of choice (LP VMRC), latent period of complex senso-motor response of distinguishing (LP SMRD), response of choice (LP RC), level of excitation and strength of nervous processes (t-test), concentration and stability of attention (tables of Anfimov, test of Shulte-Platonov), endurance and quickness of fingers (test Stamina).

Many specialists think that in spite of acquired previous experience of vocational training, development of psycho-physiological qualities of economic specialists does not correspond to demands of modern production [14], meaning that methodic of their training has not been worked out sufficiently. Professional-applied physical training of future specialists requires clear planning and control over its realization, compulsory systemic checking up and evaluation of students' fitness to labor functioning; this just shall determine special orientation of physical education [8].

It should be noted that professionally required qualities are improved in the process of professional functioning, but effectiveness of this process is increasing substantially, if certain qualities are developed purposefully in period, which coincides with vocational training [7].

Analysis of modern scientific literature shows that in physical education in higher educational establishments it is necessary to apply means PAPT, practical application of which will facilitate formation of required psycho-physiological state of students, substantial improvement of physical fitness of future specialists of information-logical group of specialties.

Purpose, tasks of the work, material and methods

The purpose of the research is determination of professionally significant psycho-physiological qualities of students of information-logic group of specialties; research of senso motor responses' indicators and parameters of attention under influence professionally-applied physical exercises.

The methods of the research: analysis of literature sources, registration of important psycho-physiological parameters, which was conducted with computer complex "NS-psyco-test" (company "Neuro Soft", Ivanovo) and operational system Windows XP Professional; pedagogic experiment, methods of mathematical statistic, computer program MS Excel 2010.

Results of the research

Application and generalization of scientific literature data [2,6, 14], analysis of questioning data, of expert evaluation of professionally significant features, carried out in Lvov bank institute and Ukrainian academy of bank business of National bank of Ukraine [13], permitted to compose grounded list of these features and level of their significance for economists by 12 points scale (see table 1).

The received results permitted to determine that realization of bank specialist's labor functioning is possible only with sufficient level of such professionally important qualities as high level of general and static endurance. The required psycho-physiological qualities include: острота зрения;

- Visual motor response; зрительно моторная реакция;
- Hearing-motor response.

Professionally important mental qualities are:

- verbal and visual memory, scope of memory, concentration of attention, re-switching of attention, stability of attention, communicability.

Nearly all questioned complained on tiredness in the second half of day; 80-85% complain on disconcentrated attention, weakening of perception.

The fulfilled pedagogic experiment, which stipulated professionally-applied exercises and increasing of academic time for PAPT at 3rd year of study in experimental group permitted to state positive influence of PAPT means on psycho-physiological qualities during academic year.

The author's program of PAPT included means of professionally applied physical training (exercises for quickness of response, motor qualities, preciseness and coordination of movements), exercises for different kinds of memory, application of complexes of relaxation(including breathing exercises, static straining and relaxation of muscles), which improved nervous processes. Transition from muscles' straining to relaxation and again to contracting facilitates peculiar training of nervous processes; correct application of breathing exercises and optimal short pauses after exhale and inhale favorably influenced on ferment systems, blood circulation in heart and brain [5]. The above listed means became a basis for realization of author's program on PAPT in experimental group.

Control group was trained by traditional program, in which PAPT means could not influence on development of professionally significant qualities. Before pedagogic experiment the tested did not confidently differ ($p > 0.05$) by psycho-physiological fitness.

Testing of psycho-physiological qualities was conducted at the beginning and At the end of academic year with following mathematical processing of data Testing results are presented in table 2 and 3..

Table 1

Level of significance of professionally important psycho-physiological qualities of economists

Professionally important psycho-physiological qualities			Rank of significance – from 0 to 12 points	
			Economist Lviv Academy	Economist Sumy Academy
Physical qualities	endurance	general	9	9
		static	10	11
		dynamic	7	8
	strength		7	8
	quickness		7	7
Intellectual features	Quickness of thinking		6	9
	communicability		6	8
	Calculative		11	10
	Operational		7	7
Psycho-physiological qualities	vision	sharpness	7	7
		Visual estimation	4	6
	Visual-motor response		7	9
	Hearing-motor response		6	9
Mental qualities	Memory	Verbal	11	10
		Visual	10	10
		Hearing	4	7
		Motion	4	4
		Scope	10	11
	Attention	Concentration	11	11
		Re-switching	4	6
		Scope	6	7

Table 2

Indicators of professionally significant qualities of control group students before pedagogic experiment

Indicators	Before experiment		After experiment				Difference (%)
	x	m	x	m	t	p	
Correction test of Anfimov	978.63	13.33	993.71	13.98	0.4	> 0.05	1.5 %
Test of Shulte-Platonov	58.42	0.56	52.58	0.41	5.5	< 0.05	10.0 %
Distinguishing response	347.13	1.81	344.42	1.39	0.8	> 0.05	0.7 %
Choice response	355.45	1.57	350.45	1.45	1.5	> 0.05	1.4 %
SVMR	222.65	2.56	215.29	1.69	2.3	> 0.05	3.3%
Test „Stamina”	122.00	1.86	128.89	1.45	3.4	< 0.05	5.3%
Tapping test	76.29	0.39	80.68	0.70	4.3	< 0.05	5.4%
Interference resistance	737.61	1.81	722.83	2.78	2.3	> 0.05	2.0%

Table 3

Indicators of professionally significant qualities of experimental group students after pedagogic experiment

Indicators	Before experiment		After experiment				Difference (%)
	x	m	x	m	t	p	
Correction test of Anfimov	914.05	16.69	1001.86	15.83	3.8	< 0.05	8.8%
Test of Shulte-Platonov	59.44	0.66	47.42	0.49	10.8	< 0.05	20.2 %
Distinguishing response	345.84	1.56	336.94	0.95	3.2	< 0.05	2.5 %
Choice response	353.39	2.52	341.06	1.24	2.9	< 0.05	3.5 %
SVMR	227.26	1.70	212.45	2.26	3.7	< 0.05	6.5 %
Test „Stamina”	121.06	2.36	155.26	3.64	8.7	< 0.05	22.02 %
Tapping test	74.77	0.45	86.45	0.80	7.9	< 0.05	13.5 %
Interference resistance	732.42	1.84	690.32	3.16	6.4	< 0.05	6.7 %

For example, during experiment time of simple visual motor response improved in experimental group by 6.5%, while in control group this indicator is by 3.2% less (see table 2).

The presented above data of visual distinguishing witness about insignificant reducing of time, but dynamic of better results belongs to experimental group. Thus, fulfillment of special physical exercises of PAPT rendered positive influence on visual analyzer's functions.

Students' ability to quick choice of response to different irritators in conditions of time deficit were determined by test "response of choice"; in experimental group this indicators was 341.06 m.sec. and in control – 350.45 m.sec.

Methodic of tapping test permitted to determine strength of nervous processes. Results showed significant increment with ($p < 0.05$) of this indicator in experimental group 13.5%; in control group this increment was 5.4%.

Application of Anfimov's table permitted to determine dynamic of mental workability's increasing. By results of research, indicator of net workability of attention's function in experimental group was 7.3% higher than in control one.

With the help of test Shulte-Platonov we estimated distribution and quickness of attention's re-switching. Total time of task's fulfillment in experimental group was by 10.2% higher than in control group; increment of results witnesses about increasing of experimental group students' mental workability.

Analysis of experimental data resulted in appearance of trend to increasing of interference resistance; better mean statistic indicator of experimental group was higher than results of control group by 4.7 %, and it is rather important because ability of an economist to percept information in spite of interferences is the basis of high effectiveness in future professional functioning.

Conclusions:

1. Analysis of literature on the topic, the conducted researches permitted to determine professionally significant psycho-physiological qualities of students of information-logic group of specialties.
2. It is purposeful to carry out choice of means and methods of psycho-physiological training in compliance with presented in the work professional characteristics of specialists of certain profile.
3. Introduction of specially selected exercises in PAPT permits to qualitatively influence on improvement of students' psycho-physiological fitness (students of information-logic group of specialties).

The prospects of further researches imply development of computerized programs for improvement of PAPT quality for students of information-logic group of specialties.

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