



PSYCHOLOGY OF PROFESSIONAL WORK

The psychological characteristics competences of specialists research departments of the organizations military-industrial complex with different work experience

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The article deals the psychological characteristics of the competences of specialists at research departments of the military-industrial complex with a different work experience. The main idea of the study was to compare the level of development of competences of specialists with different work experience.

Analysis of the data allows to predict the success of the process of professional development of specialists in the research departments of military-industrial complex.

Key words: *competence, competency model, successful professionals.*

The contemporary approach to providing the research organizations of military industrial complex (RO MIC) with human resources, making up them to strength with specialists which in greatest extent are able for science research activities in accordance with their individual psychological, personal, professional skills and competence demands the carrying out scientific well-founded professional psychological selection, valuation and placing of specialists taken on the work in research organizations of MIC and also collecting the trained cadre reserves for promotion of most successful members of staff to higher position. In spite of the sharp necessity of psychological ensuring of all these needs on real scientific base, in our opinion, the similar activities in RO MIC were earlier not full.

The complexity of such work has been intensified for the obvious reason that scientific research work rarely give way to algorithmization that, for example, can be easily made in case of operator work. The creative part of activity fulfilled by collaborator of MIC research branch cannot be divided in practice on separate components which may be subjected to time study and be described with the aid of some standard units. Moreover the scientific research work has a number of specific features. It belongs to a number of professions making of increased demands on the human psyche, his intellectual and personal qualities.

In order to solve this problem the group of experts from competent specialists was organized with purpose to analysis fulfilled the specific features of realization of scientific applied and development works which are fulfilled in the RO MIC.

It's necessary to note that the main peculiarities of development works fulfillment on MIC are their secrecy, discipline of terms, multilevel control system and rather great many executed orders.

From the point of experts view the discipline of terms and multilevel control system which provide such firmly define the hard regulation and standardization of pro-



professional activities of specialists in the RO MIC. Rather great many of orders in the same time provide multilevel and differently planned nature of.

Thus the experts revealed the three basic blocks included in the job description of research activities of RO MIC specialists.

To their number it can be attributed:

1. Hard regulation, professional activity standardization and standardization of specialist's behavior.

2. Differently planned and multipurpose character of scientific research problems.

3. The closed nature of scientific research activities in permanently forming subdivisions within organization.

On the basis of job description peculiarities of professional scientific research activities of specialist the experts were suggested to reveal the competencies needed for successful realization of scientific research problems in conditions of closed organization/ As a result of professional activity analysis the model of competence of specialists and heads of orders was developed (Table 1).

Table 1

Competence model of specialists and heads orders MIC RO

blocks (clusters)	competence	
	specialist	head order
cognitive and - prog- nostic	analyticity and systematic thinking	
	creativity and flexibility of thinking	
	ability to develop	
	ability to find new and to challenge existing scientific ideas	
	self	
	possession of theoretical knowledge and practical skills in the specialty	
	strategic planning	
communi- cative	skills of effective communication	skills of effective communication, negotiation
		skills of public speaking
corporate	commitment to the values organizations	
personal	concentricity	
	autonomy, independence	
	confidence, responsibility	
	normativity of behavior	
	stability of stress	
	orderliness, discipline	
organiza- tional - administra- tive		validity and independence in decision-making
		ability to work on the rules, standards
		leadership and ability to organize and coordinate the activities
		control of subordinates
		mentoring
	result oriented	



The experts were identified structural units (clusters) diagnosed competences of specialists: cognitive predictor (cognitive), communicative, personal, organizational-administrative, corporate.

The experts revealed the significant difference of competence of specialists with length of service till one year, till 5-7 years and the most successful specialists with length of service 10-15 years.

The main parts of professional psychological support of MIC RO employees are determining of specialist organization requirement fit and also level of competence finding. It is worth to carry out such work since for one thing the specialist involved in process of solving of difficult problems and for second thing there is a great liability for order processing. An activity analysis of MIO RO specialists showed that much of graduating students from basic universities having higher vocational education are not always psychologically fit.

If there is a discrepancy of individually-psychological, professional qualities of such specialists to MIO RO specificity, it leads to big troubles during the process of young specialist's adaptation and then these specialists get to know their profession. Much of them can fall into state of psychological overstrain. It eventually leads to appearance of professional activity displeasure, so a considerable part of young specialist retires. There is a same problem among specialists having advanced competences. For instance, almost one in five interrogated specialist, who has been working in RO MIO more than 10 years, doesn't hide an increased work indifference, 28.7 % - has problems with increased affectability and irritability, 25.4 % - has morbid symptoms considered with cardiovascular system. (172 people were totally interrogated).

According to conducted by personnel training office of FSUE AI-Russia SRI "Gradient" survey of specialists having over 15 years work experience, (226 people), 65 % of them feel some negative emissions: tiredness, apathy. Many of them (70%) go through alarm condition, feel like insignificance and status instability. All of these factors have a negative influence on efficiency and quality of their work. Here we can clearly see an underestimate of RO MIO specialists activity psychological problems.

The results obtained during the survey in FSUE All-Russia SRI "Gradient" showed necessity of analyzing such problems. 52 people from among institute managers, chiefs of sections, departments, sectors were interrogated. So, 71% from them thinks that when graduating students from base universities (departments) get a job they should to go through the professionally-psychological selection. 82.4 % supposes that psychological tests are necessary to do before including candidates on the executive position reserve.

A good working order in RO MIC equally depends on high level personal development and also on his/her special abilities. Keeping the next hypotheses that.

1. People can change if they will work hard at self-development in any concrete specific fields.
2. Personnel always have enough self-development motivation and so it will act in accordance with its own development plan.



3. It's considerably well-known what development actions will influence on what skills and abilities.

In terms of competence levels psychological support of specialists clearly describes the claims on personality of RO MIC specialist for carrying out research work.

The next work step was to select a method for degree of competence manifestation estimating, which specialists chosen by expert analysis have. Herewith it is necessary to take into account that these methods must be considerably reliable and valid, it should supplement each other and must be suitable for both individual and group survey of specialist with machine processing of test results. After a method set approbation the following tests were used as main instruments of psychological estimating: R.Cattel's inquirer of 16 factors (16 PF – form A), Kalininskiy's test.

Using above tests 130 specialists from FSUE All Russia SRI "Gradient" (90 men and 40 women aged 23–55) were studied. Among them: 40 successful specialists having work experience less than 1 year, 40 successful specialists having work experience from 5 to 7 years and 50 successful specialists (developers, constructors, technologists, chiefs of sections, departments, sectors, deputy general manager, heads of services) having work experience from 10 to 15 years.

All respondents were divided into 3 groups. The group 1 consisted of successful young specialists having work experience less than 1 year (40 people). The group 2 consisted of successful specialists having work experience from 5 to 7 years (40 people). In addition a specific group was formulated. This group consisted of achieved the greatest professional success specialist, which were approved on research department post on a competitive basis (50 people). Average test measurements of this "elite" group demonstrated a high developmental level of successful RO MIC specialist competence. Therefore the obtained results were used as an original model of psychological estimating of specialists from group 1 and 2.

A group average values of test measurements for every group and also average value difference between first and second groups coefficients by Student's criterion were measured to determination of test measurement validity as a professional selection parameter. Similarly, difference coefficients were calculated between "elite" and first groups, and also between "elite" and second groups. A machine data processing was done using standard statistical software package, which is called "Statgraf".

The results of investigation allowed to make a conclusion that there is no significant difference between young specialists having work experience less than 1 year and specialists having work experience from 5 to 7 years, at the same time there are some differences between first, second and third groups in a variety of fundamental values using R. Cattel's and L.P. Kalininskiy's methods.

The R. Cattel's analysis of respondent personality characteristics from every group allowed to find its own most distinctive features and characteristics, which respondents tend to.

By comparison of average trait profiles of specialist having work experience less than 1 year (first group), specialists having work experience from 5 to 7 years (second



group) and specialists having work experience from 10 to 15 years were obtained the following values (see Figure 1):

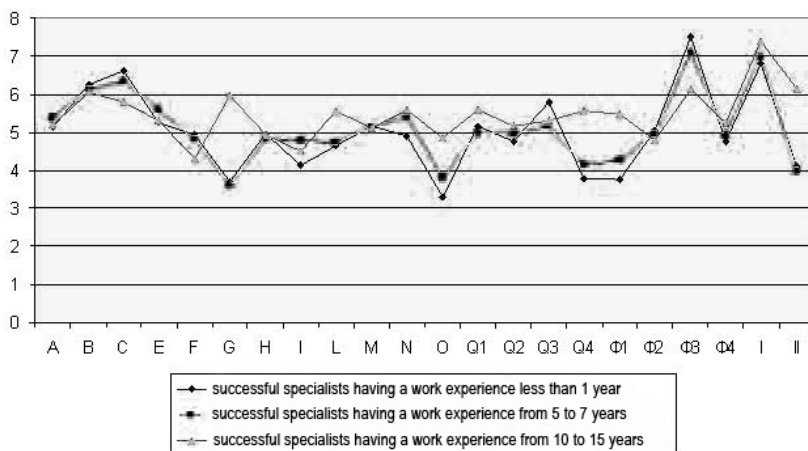


Figure 1. Average test profiles of first, second and third groups

As one can see from figure 1 there is no significant differences between group 1 and group 2 respondents.

Personal peculiarities of respondents from group 1 and group 2 are emotional instability, sensibility, irritability, low level of tolerance in stressful and frustrating situations. Usually the members of group 1 and group 2 excel by its shyness and diffidence. And with it they are enough intellectually flexible; they're inclined cogitativity vivacity and mobility; they always aspire to independence and self-sustainability; sometimes they can take a dim view of subjective events and values of other people.

Fig.1 shows near-significant difference and significant difference between group 3 and groups 1,2 f factors G ($t=6.67$, $a<0.001$), L ($t=2.49$, $a<0.01$), M ($t=2.72$, $a<0.01$), O ($t=3.32$, $a<0.01$), Q4 ($t=3.32$, $a<0.01$), $\Phi 1$ ($t=3.65$, $a<0.001$), $\Phi 3$ ($t=3.18$, $a<0.01$), and by second tertiary factor ($t=8.22$, $a<0.001$).

The analysis of these differences shows that the members of group 3 have the most expressed personal characteristics as conscientiousness, responsibility, equibrium and adherence to moral rules and norms. The respondents from group 3 as opposed to the members of group 1 and 2 are more careful, attentive to external environment, practical; the main aim of its interests is to reach a concrete result. Concernment, worry, a sense of duty for eventual result of its work, radicalism and thinking analyticity are presented in conduct of these respondents. They are liable to afterthoughts and thoughts before working; they can be inclined to some experimenting, interest to intellectual activity, to old and new scientific ideas; they are group oriented and always work taking into account group interests. The members of group 3 in contrast to members of group



1 and 2 have a higher stress-resistant values, effort tolerance, good anti-stress abilities, durability potential and firmness. In the conduct of these respondents there is some tendency to superfluous suspiciousness, distrustfulness and internal vigilance. This can be considered as recurrences of professional activity specificity.

It is significant to note that among common traits, which are typical of all survey people, are seriousness, restraint, some conservatism, rigidity, traditionalism (comparatively low estimates by factors F and Q1).

Methodic of L.P. Kaliniskiy measures a degree of the expression of personal and character features. The use of this methodic showed following results for each of inspected groups (see Figure 2).

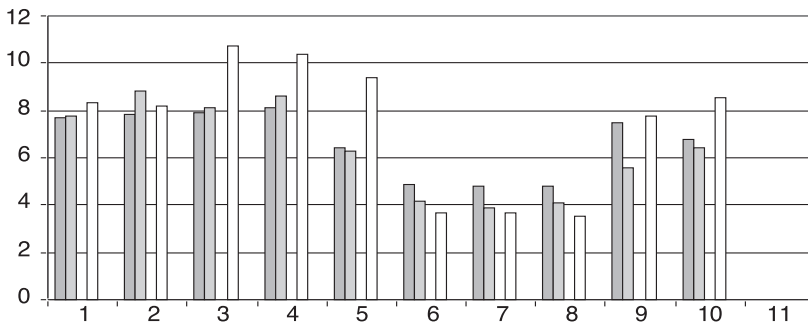


Figure 2. Average test profiles of groups 1, 2, 3

1 Purposefulness 2 Practical mind 3 Domination 4 Self -confidence 5 Hardness 6 Unsociable leader 7 Compliance 8 Dependence 9 Conformism 10 Sympathy.

- specialists with 1 year length work
- specialists with 5 to 7 years length work
- specialists with 10 to 15 years length work

Obtained data make it possible to conclude that there are no significant distinctions between the respondents of group 1 and 2 except scale 9 (confidence). Indicators on scales 1, 2, 3, 4, 5 (scales of activity of representatives of group 1 and 2 are at potential zone. Representatives of group 3 have more acute indicators on scale 3 "domination" ($t=8,44$, $a<0,001$), 4 "self-confidence" ($t=6,49$, $a<0,001$), 5 "flexibility" ($t=8,1$, $a<0,001$) and also 9 "conformism" ($t=8,14$, $a<0,001$) and 10 "sympathy" ($t=6,65$, $a<0,001$). Indicators of scales 1, 2, 3, 4, 5, 9, 10 (scales of activity) are at the perspective zone of the representatives of group 3. The respondents of group 3 have features like: self-subordination, the desire to be of good opinion because of the acute feeling of dignity, ambition, the desire to be famous, to have high status.

Representatives of group 3 have more acute indicators like insistence, strong will, the resolute form of requests, the will to achieve the aim by any means, frankness, straightness, excessive irritability. In relations with other people there is acute sense of propor-



tion and tact, quick reaction, influence and contact with another people coming out from individual features. They take the needed tone quickly, they are ingenious at the first meeting and contact, are able to value the situation and to adopt to it, assist to the others prosperity actively to co-operate with the leader, sociable and easy to live with, natural in behavior with other, do not long far the fast profit. They are selfless and disinterested.

Data about the fluctuations of specialists from scientific institute department having a work experience for 1 year, from 5 to 7 years and from 10 to 15 years at the period from 1998 to 2007 allow to reveal the distinctions at the level of corporate competences, first of all in attitude to the organization (loyalty to the organization), the results are on the table 2.

Table 2

**Indicators of the fluctuations of specialists, department of FSUE
“ARSRI” “Gradient” at the period the period from years 1998 to 2007**

Group of specialists/ year	Specialists discharged from scientific research department (%)										Average value (%)
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Group 1	25	31	38	30	31	28	25	26	25	23	28,2
Group 2	57	61	78	75	59	79	68	49	54	53	63,3
Group 3	8	7	14	17	16	8	6	4	2,6	3	8,5

As one can see from this table, the second group of respondents changes the places of work more often; these respondents have a work experience from 5 to 7 years. Also, a big percentage of respondents, who change their work are those, with 1 year work experience, young specialists. It tells about the fact, that they have difficulties in adaptation to this kind of work. The results of the research confirmed the validity of use of these methods and testing criteria measuring the competence level, they revealed the distinctions between the specialists having a work experience for 1 year, from 5 to 7 years and from 10 to 15 years, first of all by the development level of their organizational and leading abilities.

A competence model developed by experts and performed competence diagnostics find out a necessity of its progressing, further correcting using professional psychological programs. In turn it will affect the success of research department of MIC organization in tote.

Modern development of defense organizations causes the necessity of creation of the service of psychological support, stuffed with psychologists, who know the specificity of MIC and research work, who can give skilled help to the employees.

One of the prior directions from this point of view is the foundation of the psychological selection system and support of the research defence complex specialists, and also their competence rating.

In paper, the mass involvement of psychologist in the research work will objectively make effective the training in high schools faculties of radio electronic systems and decrease the adaptation process for young specialists to the organization specifics and forming of required competences.



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