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Improving Professional and Psychological Selection and Further Development of Professionally Important Qualities of Specialists on the Protection of Important State Facilities in the Course of Educational Activities with the Use of Information and Communication Technologies

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Abstract

In this paper we propose to improve the system of professional selection and development of specialists in the protection of important state objects using the developed method. The model of development of psychological characteristics determining success of educational and professional activities in the training center of Russian Interior Ministry troops is suggested.

Keywords: security of nuclear facilities, internal troops, professional selection, the success of educational and professional activities, informational communication technologies

1. Introduction

One of the priorities in the field of state security is the organization and ensuring of reliable protection of nuclear industry. Presence of production facilities for the extraction and processing of radioactive materials, nuclear-
hazardous industrial objects, objects of the nuclear weapons complex requires a special approach to high quality training of specialists of protection of important state objects, their selection, training and continuous professional development. However, particular relevance nowadays is automation and use of information and communication technologies (ICT) to improve these activities, and developed and implemented psycho-educational technology should be focused on their complex application.

Conducted theoretical and methodological analysis of this problem showed the need for continuous improvement of systems and activities for the selection, acquisition, training and further professional development of specialists of named categories in response to the growing level of terrorist threat (Andreevsky, Nazarenko, Paderno, 2015).

2. Objectives, methodology and research design

The study was conducted at the training center of Russian Interior Ministry troops in three phases:
1) at the beginning of training (on arrival at the training center);
2) at the end of training (before qualification exams);
3) at the expiration of three months.

We studied individual psychological characteristics of the specialists, professional psychological selection schemes and existing programs and methods of teaching and professional development (Table 1).

Table 1. Description of the study

<table>
<thead>
<tr>
<th>Studied contingent</th>
<th>Period of study</th>
<th>Studied number</th>
<th>Number of applied methods</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studying</td>
<td>January, 2013</td>
<td>100 people</td>
<td>5</td>
<td>1. At entering</td>
</tr>
<tr>
<td>Graduated</td>
<td>March, 2013</td>
<td>100 people</td>
<td>5</td>
<td>2. After graduation</td>
</tr>
<tr>
<td>Military servicemen for important state objects protection</td>
<td>June, 2013</td>
<td>100 people</td>
<td>5</td>
<td>3. After 3 months</td>
</tr>
<tr>
<td>Control group</td>
<td>August, 2013 – January, 2014</td>
<td>56 people</td>
<td>5</td>
<td>At 1, 2, 3 stages</td>
</tr>
<tr>
<td>Experimental group</td>
<td>August, 2013 – January, 2014</td>
<td>54 people</td>
<td>5</td>
<td>At 1, 2, 3 stages</td>
</tr>
</tbody>
</table>

The object of the study were military servicemen of specialties junior commander numbering 108 soldiers and technical protection devices mechanic numbering 102 people. The total sample size was 210 people. Age of studied ranged from 18 to 29 years. All students successfully completed the professional psychological selection, as fit for duty - military medical commissions. Each of the students has satisfactory housing conditions, 47% of surveyed are married, 14% are unmarried, 41% idle, 188 subjects have secondary education and 22 subjects have higher education. Psychodiagnostic survey covers the period of 1 year.

The study was based on theoretical basis of personality development during adolescence. The choice of methods and techniques of psycho-diagnostic examinations was made due to the results of the theoretical - methodological analysis of the problem of the student, as the subject of learning activities. In order to survey the psychological characteristics of the generally accepted and used in the internal troops techniques, psychodiagnostic studies were taken for variables needed to study.

3. Discussion of the research outcomes

The psychological characteristics, features and capabilities of the candidate are the following.
Orientation of the person in the educational - professional activity
1. Interest in the training and further professional activities - analysis of documents, individual interviews, methodology of motivation to succeed of T. Ehlers.
2. The ratio of the service in the Interior Troops of Russia - document analysis, individual interview, observation.
3. Confidence in the social demand and the social significance of their profession - analysis of documents, individual interviews, methodology of motivation to succeed of T. Ehlers.

4. Striving for continuous improvement of professional knowledge and skills - analysis of the documents, individual interviews, methodology of motivation to succeed of T. Ehlers.

5. The pursuit of organizational and management in a military collective and focus on the success of the subordinate staff - analysis of the documents, individual interviews, CBS-2 to 2 sections.

**Personal capacity**

6. Organizational skills - analysis of the documents, CBS - under section 2 (organizational inclination), PF 16 for F and H.

7. Intellectual capacity - analysis of documents, individual interview, 16 PF variable B.


9. Ability to avoiding adverse situations - document analysis, observation, individual interviews, technique of motivation to avoiding failure of T. Ehlers.

10. The ability to make rational and informed decisions - document analysis, observation, 16 PF variable I, N, Q2, monitoring.


**Psychological characteristics of the nature of the person**


13. Emotional stability - analysis of documents, observation, 16PF variable C, F.

14. Subordination - document analysis, observation, 16PF variable E.

15. Expressiveness - document analysis, observation, 16PF by a factor F.

16. High normative behavior - analysis of documents, observation, 16PF variable G, IPC-Adaptability factor for MN.

17. Courage, confidence - document analysis, observation, 16PF variable H, O.

18. The rigidity - document analysis, observation, 16PF variable I.

19. Suspicion - document analysis, observation, 16PF variable L.

20. Practice - analysis of the documents, observation, 16PF variable M.

21. Radicalism - individual interviews, 16 PF variable Q1.


23. Excitation (voltage) - document analysis, observation, 16PF variable Q4.

24. Resourcefulness - interview, observation, 16PF variable F.

25. The validity - individual conversations, 16PF variable G, Q3.


27. Passionarity - analysis documents, individual interviews Q1, Q2, O.

28. Self-analysis with the aim of understanding the significance of his actions in the activities of the team - document analysis, observation, individual interviews 16PF variable G, Q3, Q1.

29. Hardness - document analysis, observation, 16PF variable I.

30. Tolerance - individual interviews, observation, 16PF variable S.

**Nervously - mental and emotional - strong-willed resistance**

31. Neuro-psychological stability, ability to avoid mental breakdowns in conditions of enhanced mental and physical exercise - individual interviews, observation, IPC by a factor of NHRIs 16PF variables F, C, G, Q3.

32. The ability to cope with negative emotional states (fear, anxiety, shyness, anger, rage, etc.). IPC-AM, by a factor of NHRIs with variable 16PF, H.

33. The ability to maintain performance under difficult activity when exposed emotiogenic and stress factors (for a limited time during the decision-making training in conditions close to combat, training at night, etc.) - 16PF variable C.

The system of training in training centers is designed to train a soldier to carry out tasks, based on the specific characteristics of a post, and forms a solid foundation of knowledge and skills necessary for their successful
implementation. This training should be the basis for the further formation of a military-professional orientation and psychological characteristics necessary for the military in the process of teaching - the professional development of its activities as a responsible and competent expert.

To achieve the objectives of the research into the complex psycho-diagnostic techniques we used:

1. 16PF Questionnaire for determining certain personality traits (character traits), combined into 16 functionally related factors causing human behavior in a variety of conditions.

2. Multi-level personality questionnaire "adaptive" to assess the adaptive capacity of the applicant in view of some physiological and psychosocial characteristics reflecting the integral features of mental and social development, such as the level of behavioral regulation, nervous and mental stability, communication qualities, moral norms.

3. The test questionnaire "CBS-2" for the diagnosis and assessment of the level of communicative and organizational tendencies specialists.

4. Method of diagnosis of personality motivation to avoiding failure T. Ehlers - to determine the level of orientation of the person in the avoidance of adverse situations.

5. Methods of diagnosis of personality motivation to succeed T. Ehlers - for determining the level of focus on the success of the individual.

6. Analysis of success on the main subjects of study, to determine the overall performance of the ball, with a view of assessing the level of practical and theoretical training.

The sequence of solving problems of the research is as follows:

1. Identify the psychological characteristics that determine the success of educational activity of students the training center of internal troops of the Russian Interior Ministry.

2. Determination of the dynamics of the psychological characteristics of the individual in the learning process and further military - professional activities.

3. Development of a model of psychological characteristics of experts on the protection of important state facilities for the successful training and further professional activities.

On the basis of the research results we proposed a complex method of psychological selection and further professional development of specialists in the protection of important state objects which includes:

1) analysis of regulatory legal acts of the Russian Federation, the requirements of the Civil Code of Russia's Ministry of Interior contract military service requirements and state standards for military specialist;

2) professional psychological selection for military service under the contract;

3) methods of development of psychological characteristics of experts on the protection of important state objects, determining the success of the training and further professional activities;

4) service-combat activities;

5) psychological support of educational and professional work in this specialty (Fig.1.) (Akhmedkhanov & Gubin, 2013).
One of the structural elements of this methodology is the model of development of psychological characteristics of specialists of the protection of important state objects, determining the success of the training and further professional activities. This model consists of the following units:

1) the studying of individual characteristics, moral and professional qualities of trainees, who came to study at the training center of internal troops of Russia. At this stage psychodiagnostical examination, examination of documents and summarizing the data is conducted (Gubin & Zagoryuev, 2011);

2) revealing the psychological characteristics of trainees, that determine the success of the training and further professional activities. At this stage, we investigated the correlation ties with psychological characteristics of trainees, conducted a comparative analysis of the psychological characteristics of the group of trainees with high academic performance with a group of low achievers (Akhmedkhanov, Andreevsky, Gubin, 2014);

3) definition of the dynamics of development of the psychological characteristics of trainees in the training center of Russian Interior Ministry troops. At this stage, the individual performance is analyzed in the course of training at the training center and learning in professional activities. A comparative analysis of the psychological characteristics of trainees in the first stage of examination (upon arrival at the training center) with the second phase of the survey (at the end of training at the training center) and the first to the third phase of the survey (during training in the course of professional work, after 3 months from the end of learning) was conducted using statistical Student t-test separately for the group of high achievers and low achievers;

4) forecasting of success of educational activity on the basis of certain psychological characteristics of the subjects of study (Akhmedkhanov & Gubin, 2014). In order to determine the prognosis of success of educational activity we conducted multiple regression analysis by Stepwise method (step by step) (Maklakov, 2008).

Linear regression equation of trainees (“younger commanders”) with high academic performance is:

\[ Y \text{ (prognosed success)} = 0.41 * X_1 + 0.16 * X_2 - 0.21 * X_3 - 0.09 \]

where: \( X_1 \) is «non-conformism» (Q2); \( X_2 \) is «adaptation skills» (AC); \( X_3 \) is «diplomacy» (N).
Interval of high achievers in specialty “junior commander” is: $3.25 \leq Y \leq 4.87$.

Linear regression equation of trainees (“technical protection devices mechanics”) with high academic performance is:

$$Y \ (\text{prognosed success}) = 2.72 - 0.21 * X_1 - 0.17 * X_2 + 0.08 * X_3 \ (2)$$

where: $X_1$ – «obedience» (E); $X_2$ – «neuro-psychical stability» (NPS); $X_3$ – «failure avoiding motivation» (FAM).

Interval of high achievers in specialty “technical protection devices mechanics”: $3.15 \leq Y \leq 4.98$.

Numerical values of the psychological characteristics identified as a result of psycho-diagnostic examinations were substituted in the obtained regression equation. For the purpose of distribution to the specialties, which are more suitable for trainees, obtained numerical indicators of psychological characteristics were put in both equations. Decision on the distribution to the specialties was made on the basis of the closest contact with the numerical value in the range of one of the specialties. Forecast accuracy was determined by relating the number of forecasts in each group of subjects. The first group of subjects included trainees that were distributed in the field without the use of the developed technique (control group), and the second one included the ones which were distributed on the basis of the application of this technique (experimental group). In the first group test of the 125 trainees in 62 forecasts success of training proved, which accounted for 49.1%, while the second group of 110 trainees in 82 forecasts success of training proved, which amounted to 75.2%.

Block 5 is teaching method based on the implementation of the theory of subsequent formation of mental actions of P. Y. Galperin. To implement this technique, practical actions was taken in the course of methodical preparation, that practiced in conjunction with the filing of theoretical positions on the subjects of study, and methodical preparation was carried out not by a separate section, as indicated in the combat training program, but in complex with the objects of study (Lavina, 2005). This technique has the following structure:

1) bringing the main general theoretical and narrow professional terms and concepts on the subject of training;
2) the use of the operational implementation of the scheme “OSVD”; schemes for orienting basis of action based on the provisions proposed by professor P. Y. Galperin (Fig.2) (Streltsov, 2014).
4. Conclusion

The success of the educational and professional activity for the specialists of protection of important state objects after the implementation of this model has reached 75.2%. The obtained results determine the importance of the application of the developed technique for improving the activities of professional selection and development experts in the protection of important public facilities, which will improve the overall level of efficiency of physical protection in nuclear industry.

Correlation analysis revealed a number of psychological characteristics of subjects in the group of high achievers with regard to the assessment of success of training for three phases of the study. These characteristics include: the stiffness, sociability, suspicion, nonconformity, motivation to succeed, neuro-psychological stability. But the correlation analysis is not sufficient to determine the psychological characteristics that determine the success of the training and subsequent career, and was used to identify the links between performance assessment and psychological characteristics of subjects, not fully identifying their cause - effect basis. In this connection, the next step was to conduct a comparative analysis between the group of high achievers and low achievers group of subjects using Student t-test (detection of differences in the group means). The results revealed significant differences in the following psychological characteristics of students of specialty junior commander: rigidity, suspiciousness, developed imagination, diplomacy, non-conformism, nervous and mental stability, motivation to succeed.

Comparison of the results of the correlation and comparative analysis revealed the presence of psychological characteristics with regard to the assessment of the success of training and further professional activities during the
three phases of the study (correlation analysis) and higher rates of psychological characteristics in a group of high achievers in comparison with a group of low-achieving professionals (comparative Analysis of T-Student's test). These characteristics include: the stiffness, suspicion, nonconformity motivation to succeed, neuro-psychological stability.

Thus, the psychological characteristics have been identified experts on the protection of important public facilities, affecting the success of training and further professional activities. Based on the findings in the future we can make professiogram and psychogram for the specialists of the protection of important state facilities.

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