ASSESSING OF THE MILITARY PROFESSIONAL COMPETENCIES

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Abstract

The military professional forming of cadets is in the core of the mission of Vasil Levski National Military University - Bulgaria and of the training process. Despite of this, the efforts not always achieve the desired results during the training of each cadet. All these require the military professional realization of the cadets to be subjected to an overall and profound analysis and on that base to find out the achievements, to reveal the weaknesses and difficulties of the process, to identify the reasons for them and to outline the directions and means for its improvement.

Keywords: professional competencies, customer satisfaction, military training, training of cadets.

1. INTRODUCTION

The goal of the military professional realization of the cadets results from the mission of Vasil Levski National Military University. In the light of its contents it represents a developing in the cadets of the basic military professional competences and abilities of the Commander. The academic training at Vasil Levski National Military University builds the fundamental military professional abilities of the commander in the prevailing part of the graduates. Part of the graduating officers adapt more difficult to the environment of the military units, they are not capable enough of working together with the subordinated personnel and don't demonstrate the needed independency, activity and persistence during the execution of the assigned duties. Although, that in the last few years the military professional realization of the Cadets is the core of their training, the made efforts not always achieve the desired results during the training of each cadet for a versatile Commander (Banabakova, Georgiev, 2017).

All these require the military professional realization of the cadets to be subjected to an overall and profound analysis and on that base to find out the achievements, to reveal the weaknesses and difficulties of the process, to identify the reasons for them and to outline the directions and means for its improvement (Banabakova, Georgiev, 2017).

2. NATURE AND STRUCTURE OF MILITARY PROFESSIONAL COMPETENCES

The military professional capabilities of the officer represent a specific reflection of the structure and of the contents of his activity. As we know, it can be reduced to the performance of the following functions: organizer, leader, educator, military specialist, Head of the daily military life. These functions are connected with each other and complement and support each other while performing the tasks, assigned to the

Commanders. A special place among them occupies the organizational function. It represents the main contents of all the rest, ensuring their qualitative performance. Its importance increases rapidly under the modern circumstances.

The professional capabilities represent such a totality of individual mental qualities of the person, which determines the successful learning, performance and improvement of the particular activity. The successful learning of knowledge, habits and competences and the building of a Commanders' mastery depend on the capabilities. On entering Vasil Levski National Military University the young people usually possess only potential capabilities for the performance of the military professional work. These are features of their personality, which had been developed during their former viable activity. Certain inborn prerequisites have a share in this development. They can have both favorable and negative influence on the learning and performance of a particular work (Banabakova, Georgiev, 2017).

Gradually during their life and in the process of their training at the Military University the potential capabilities are transforming into actual military professional competences. But they are being upgraded, manifested and developed, depending on the ability of the academic staff to model the conditions of the officer's work and to engage the Cadet to participate actively in the work.

The military professional activity is determined by a range of military professional qualities and competences. The target qualities (motives, affiliations, ideals, interests, leanings, self-esteem) determine the military professional inclination of the Cadet, while the preparedness, including: knowledge, habits and competences, is a necessary condition for the performance of the work (Ivanov, 2014-a; Glushkov, Simeonov, Georgiev, 2018; Glushkov, Simeonov, 2018a-b).

The combat competences represent capabilities of the brain, of the emotions and of the will. In combination with the organization abilities they guarantee the successful battle guidance. They are being displayed in an analytical-synthetic kind of thinking; in rapid orientation; operability and flexibility of thinking; in ability to capture the trend for change of the situation; in foresight; in combination of courage of thinking and risk with prudence; in sense of the location, time and dynamic of the battle; in preparedness to take a personal responsibility. They comprise also such will qualities, as: purposefulness, persistency and determination, courage and self-control, independency and sense of initiative.

The special military competences are particular for each speciality and are reflected in the qualification characteristics and study plans of each speciality. The military educational capabilities include constructive, organization and communicative skills. These skills are based on an educational leaning of the watchfulness, imagination and thinking; on the pedagogical tact and rigour; on the ability to link the study materials with real life and practice; on consistency, convincingness and figurativeness of the speech and also on a number of specific qualities, representing elements of the pedagogical technique.

The organization skills are being specific only for the organization work. They include: specific watchfulness, practical organizational thinking, psychological tact, emotional and cognitive steadiness, rigour and leaning to organizational activity.

The common qualities (discipline, organization, communicativeness, efficiency etc.) make another very important condition for a successful officer's work. They are called "common", because they are related to the performance of each function of the work. The conditions of the contemporary battle and the training of the military personnel for it require from the Commander also such physical abilities as: strength, steadfastness, fastness, agility and flexibility.

During the process of the officer's practical activity all these qualities and abilities complement and determine one other, affect each other thus developing and readjusting. Depending on the contents and the specific features of the speciality, some of them become more important, occupying a leading position, while others step backward (Terziev, 2017a; Terziev, Nichev, 2017b-e; Terziev, Nikolay, Bogdanov, 2017f).

3. METHOPDOLOGY FOR ASSESSING THE QUALITY OF CONDUCTED TRAINING

Considering the dependency of the level of the acquired competences on the quality of training, and also by defining the relation between the level of professional competences and the customer satisfaction, by analysing the level of satisfaction on the part of the users of qualified personnel by their routine activities at their workplaces, the following can be established with relative probability (Petrov, 2018c):

- the level of professional competences acquired by the trainees who have competed the respective training course, with follow-up information about the level of their professional training;

- the quality of the training process conducted by the higher educational institution.

The environment in which a particular training course is conducted shall be considered as system because the following distinguishing features of systems are present (Trendafilov, 1995):

- presence of interrelated and jointly functioning elements;

- presence of goals which determine the purpose and functioning;

- presence of management which the efficiency and the functioning of the system depend on;

- presence of hierarchical structure;

- interaction with the external environment and dynamics.

The presented assessment of the quality of training is based on indicators for the quality of the system in which it is conducted. The indicators of the quality of systems are external and internal. The external ones characterize a system from the perspective of the requirements to it set by hierarchically superior systems which determine the external properties of the system. Generally each system has got a particular number of external indicators. The systematic approach requires the comparison of systems to be done by a combination of these, and not by separately taken ones. Therefore, in the examination and analysis of the training system a generalized quality indicator (Q) has to be introduced, which represents a combination of indicators describing the examined system (Trendafilov, 1995-a)

Thus the generalized quality indicator can be presented as a function of *n* external indicators of the quality of the system P, where i = 1, 2, …n.

$$Q_i = f(P_1, P_2, P_3 \ldots P_i \ldots P_n) \tag{1}$$

When calculating the generalized quality indicator of the training system (TS) it has to be considered that each of the external indicators which describe the system have different influence on the final result which leads to the necessity to set the weight (rank) of the indicators based on their importance by setting weight coefficients. The values of the weight coefficients are determined by the method of experts' valuations.

Consistent with the weights coefficients of the indicators, the expression of the generalized quality indicator of TS looks as follows:

$$Q_i = \sum_{i=1}^{n} k_i . P_i \tag{2}$$

where:

P_i – importance of the ith external indicator;

k_i – the weight coefficient showing the importance of the indicators.

When calculating Q_i the requirement for limits shall be observed and it imposes the following limitations:

$$0 \le P_i \le 1; \quad 0 \le Q_i \le 1 \tag{3}$$

The quality of functioning complex systems, as training systems are, is assessed through their efficiency because the most complete and objective assessment of the quality of such systems may be determined based on the extent to which they correspond to their target purpose.

The efficient functioning of a particular training system (TS) will guarantee the ability to achieve the respective quality of training, and thus efficiency will be the measuring unit which characterises both the process of functioning of its elements and the general functioning of the system. The efficiency of the conducted training process in this case appears as a degree to which the planned activities are accomplished, and the set goals – achieved, therefore, efficiency should be considered as a synonym of the concept of quality, because through it the nature of the training and its results are assessed. The efficiency reflects the achievement of the goals of the training that have been set as expected final result of the functioning of the system, and namely – the achievement of particular quality of training delivering competitiveness and labour market prospects of the trainees who have completed it. The introduction of the concept "efficiency of the training" is necessary in order to determine the efficiency of the examined TS.

"Efficiency of the training" means the level of conformity of its target purpose at set conditions of functioning; therefore efficiency will appear to be that measure of quality and will be possible to be defined as a measurable criterion of the quality of the conducted training. Determining the efficiency of the training will provide the opportunity to assess relatively precisely to what extent the quality of the training will satisfy the customer requirements and expectations and it will be used as a benchmark for selection of architecture of

TS.

In order for a quantitative assessment to be made of the efficiency of the training it is necessary to acquire a numeral characteristics or a combination of characteristics which represent the degree of suitability of TS to fulfil the set goals. The numeral measure defining the degree of suitability of TS to fulfil the set goals will be called "indicator for efficiency of the training".

Quantitatively the efficiency may be assessed as the extent to which the quality of a real training system is approximated to such a system which best satisfies the requirements for the training, called "benchmark". Therefore, the indicator for efficiency E_i is represented as follows:

$$E_i = \frac{Q_i}{Q_e} \leq 1 \tag{4}$$

where:

E_i – indicator for efficiency of the real training system;

Q_i – generalized indicator of the quality of the real training system;

Q_e – generalized indicator of the quality of the benchmark training system.

Considering formula (2) for E_i, we will have:

$$E_i = \frac{\sum_{i=1}^{n} k_i.P_i}{\sum_{i=1}^{n} k_i.P_i} \tag{5}$$

Where in this case P_{ei} is the ith indicator of quality of the benchmark system.

In compliance with the above indicated requirement for limitations (3) each of the external indicators for quality of the benchmark training system fulfils the condition $P_{ei} = 1$, therefore for E_i we have:

$$E_i = \sum_{i=1}^{n} k_i.P_i \tag{6}$$

The resulting indicator of efficiency of the training E_i is then compared to a particular limit value determining to what extent the quality of the training satisfies or does not satisfy the customer requirements.

This methodology envisages the determination of the efficiency indicator E_i to be determined in the following sequence:

- Selection of the external indicators describing the examined TS.

- Ranking of indicators and determining their weight coefficients.

- Calculating the values of the external indicators.

- Calculating the efficiency indicator of the training.

The general conclusion for the quality of the training in TS is done based on the following limits for the acquired value of the indicator:

- if $E_i \geq 0.876$ – the quality of the conducted training is very high and the customers will be fully satisfied by it;

- if E_i is in the interval 0.626÷0.875, the quality is high and the customers are satisfied, however they have recommendations and remarks to the training;

- if E_i is in the interval 0.376÷0.625, the quality is low, therefore the customer satisfaction will be low;

- if $E_i < 0.375$, the quality is very low, and the customers are fully dissatisfied by the conducted training.

If the calculated value of the efficiency indicator of the training is $E_i < E_{lim} = 0.626$, then follows the conclusion that the examined training system does not fulfil fully its purpose to ensure high quality training which satisfies the users of qualified personnel. If the resulting value of E_i is below the indicated limit, then this will require change in the TS aiming at raising its efficiency which will lead to improving the training conducted in this system.

Selection of the external indicators describing the examined TS

The external indicators of quality are quantitative characteristics of the properties of the system and comprise its quality [6]. As the indicators of quality reflect the public need in particular conditions, so in this case they have to be chosen in such a way as to describe best the requirements of the users of qualified personnel to the competences acquired through the conducted training.

The indicator is defined as characteristics which can be measured in order to assess a particular action, which may be related to measuring a set goal, achieved effect, degree of quality or a variable related to this. With regards to quality, the use of indicators has to be part of quality cycle, comprising the following main steps: planning, monitoring, assessment and modification in accordance with the performed analysis on the basis of the results acquired from the assessment, and thus quality should be improved (Seyfried, 2007).

The external quality indicators of training system may be selected indicators which take account of the level of competences built through this system. This is so because by assessing the level of the built competences of the trainees who have completed the training, the current state of TS may be established and a starting point may be set from which onwards to begin a process for raising the quality of training as well as to provide information to what extent the goals of the training have been achieved.

The setting of indicators for assessing the level of professional competences suggests clarifying the goals that have to be achieved for raising the quality and satisfying the requirements of users of qualified personnel, and the condition for the selected indicators to allow monitoring and assessment, i.e. to be sufficiently specific, has to be observed. It should be also taken into account that each of the indicators will have a different role for the general assessment of the quality, which on its part leads to determining and using importance coefficients of the indicators themselves.

The following major requirements have to be observed when selecting indicators:

- to have central importance for the activities (competences) which will be assessed;
- to be exhaustive, reflecting the most important dimensions of the activities in question;
- to be clear and easy to understand;
- to use as few as possible indicators.

The proposed methodology provides opportunity for establishing the level of possessed professional competences of the trainees who have completed a training course and it can be successfully applied if a particular number of indicators y_i is set, which, following the experts' assessment, to be ordered by their importance (significance) and to assign them numeric mark related to the satisfaction from them.

A successful method for collection of primary data about the satisfaction may be direct interviews in the form of a standardized questionnaire (standardized interview) through which to be performed an integrated assessment of the level of satisfaction of the users of qualified personnel from the quality indicators determining the level of professional competences taking account of their priorities.

In order for this assessment to be applicable the beneficiaries, in their capacity of experts in their area, have to fill out particular information, which may be in tabular form – a table consisting of three columns, the first column containing the selected indicators in random order without numbers before them, the second column containing those indicators which have to be arranged in the order of their importance by the interviewed people, and in the third column the interviewed have to indicate the level of satisfaction from each indicator according to a five-point Likert scale.

Ranking of indicators and calculating their weight coefficients

In the framework of each system its quality indicators almost always have different importance for its general assessment. In most general sense, the importance of the indicators for the general assessment is determined by the importance of the properties which these indicators characterize. In the assessment process weight coefficients have to be used for each of them.

The methodology for determining the importance and the weight coefficients of each indicator is as follows (Kendall, Gibbons, 1990; Stoyanov, 1993):

Creation of ranking matrix

The results acquired from the assessment card are written down in a weight matrix (table 1). Each numeral in the matrix a_{ij} determines the weight (rank) which the expert R assigns to the indicator j.

Table 1. Ranking matrix for quality indicators.

Indicator / Expert	y_1	...	y_j	...	y_m
1	a_{11}	...	a_{1j}	...	a_{1m}
...	...	...	...	...	...
i	a_{i1}	...	a_{ij}	...	a_{im}
...	...	...	...	...	...
R	a_{R1}	...	a_{Rj}	...	a_{Rm}
$\sum_{i=1}^{R} a_{ij}$	$\sum_{i=1}^{R} a_{i1}$	...	$\sum_{i=1}^{R} a_{ij}$	...	$\sum_{i=1}^{R} a_{im}$
Δ_j					
V_j					
k_j					

Calculating the concordance coefficient (concordance) among the interviewed.

The concordance in the experts' opinions is calculated by verifying the concordance coefficient ω_c following the methods of rank correlation (Kendall, Gibbons, 1990):

$$\omega_c = \frac{12.\sum_{j=1}^{m} \Delta_i^2}{R^2.(m^3-m)}$$

(7)

where:

m is the number of the indicators for assessing the level of professional competences;

R is the number of experts;

Δ_j is the deviation of the sum of the ranks for each indicator from the mean sum;

$$\Delta_j = \sum_{i=1}^{R} a_{ij} - S_{mean}$$

(8)

S_{mean} is the mean sum from all ranks;

$$S_{mean} = \frac{R.(m+1)}{2}$$

(9)

$\sum_{i=1}^{R} a_{ij}$ j = 1, 2, ..., m – the sum of the ranks for each indicator.

Verification of the concordance coefficient for importance.

The concordance coefficient may acquire values from 0 in cases of total inconformity in the experts' opinions to +1 in cases of full agreement. The assessment of the importance of the derived coefficient ω_c in accordance with the used methodology will be verified through the Pearson's *criterion* χ^2, as the number of indicators m ≥ 7 (Stoyanov, 1993).

$$\chi^2{}_{calc} = R.(m-1).\omega_c \tag{10}$$

The concordance coefficient is important under the condition that:

$$\chi^2{}_{calc} > \chi^2{}_{table}(\alpha, \upsilon) \tag{11}$$

The value of $\chi^2{}_{table}$ is taken from a table (Chi-square Distribution Table) with indicated level of importance α and degrees of freedom $\upsilon = m - 1$.

Calculating the weight coefficients for each indicator.

If there is agreement in the experts' opinions the weight coefficients are calculated (Stoyanov, 1993):

$$k_j = \frac{V_j}{\sum_{j=1}^{m} V_j} ; j = 1,2, \ldots, m \tag{12}$$

where:

$$V_j = \frac{R.m - \sum_{i=1}^{R} a_{ij}}{R.m - R} \tag{13}$$

Upon calculation of the coefficients the following condition has to be fulfilled:

$$\sum_{j=1}^{m} k_j = 1 \tag{14}$$

Calculating the mean value of the satisfaction of all experts for each one of the indicators.

For calculation of the mean value of the satisfaction representing the level of satisfaction of experts from each indicator of the professional competences, the method of the simple assessment has been used, which is based on analysis of data acquired from interviews. The data from all respondents is processed and the marks of the mean values from all interviewed are calculated.

An indicator of the general experts' opinion may be one of the measures of the central tendency – mode, median and mean. The most popular model of experts' assessment is the additive one, through which the average value is derived.

The average value of satisfaction $\overline{y_i}$ from each quality indicator is determined through the formula:

$$\overline{y_i} = \frac{\sum_{i=1}^{R} y_{ij}}{R} \tag{15}$$

where:

y_{ij} are the values of satisfaction for each of the indicators indicated by the experts;

R is the number of interviewed people.

Calculating the values of the indicators

In order for the requirement for limitations (3) to be observed, the values y_i, which reflect the customer satisfaction, will be scaled to the interval in which P_i has to change, i.e. from 0 to 1. The transition from y_i to P_i is used:

$$P_i = \frac{\overline{y_i} - y_{i\,min}}{y_{i\,max} - y_{i\,min}} \cdot |P_{i\,max}| \tag{16}$$

where:

P_i – importance of the ith external indicator;

y_i – the value of satisfaction derived from the examination of the respective indicator (1,5).

Calculating the indicator of efficiency of the training E_i and comparison with the limit value.

The efficiency indicator E_i is derived after substituting the calculated values for weight coefficients of the quality indicators c_i and the importance of the indicators P_i in formula (6).

The next step is to compare E_i with the determined above limit value determining satisfaction or dissatisfaction of the consumers of the training (fig. 1).
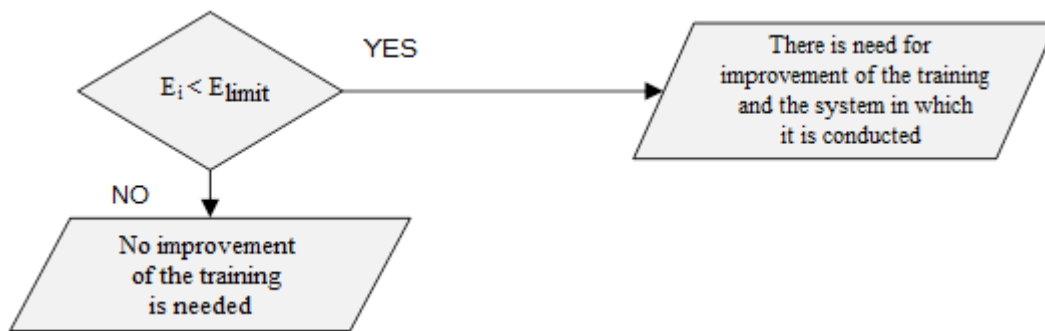

Figure 1. Comparing the efficiency indicator of the training.

If the calculated value for E_i is above the limit for the value E_{limit}, where consumers are fully satisfied with the built competences in the trainees, there will not be any need for improving the conducted training. However, if E_i is lower than E_{limit} this will mean that the quality of the training is dissatisfactory, consumers are dissatisfied, and therefore, improvement is needed.

Raising the efficiency of the training system, and respectively of the quality of training can be achieved by improving several aspects: change in the organizational processes expressed in change of the organization of the training process (syllabi, ratio between the types of classes in the curricula, change in the set of studied disciplines, change in the content of the curricula, hours of training classes – increase or reduction of them), raising the qualification of trainers, updating the teaching and equipment resources and a combination of the above (Petrova, Marinov, 2019; Petrova, 2019a; Petrova, 2010; Petrova, 2010; Atanasov, Mitev, 2016-a; Atanasov, Mitev, 2017g; Atanasov, Stoykov, 2016b).

4. CONCLUSION

The quality in the functioning of complex systems, to which each training system belongs, may be assessed through the results of their activity and the level of conformity of their target purpose in set conditions of functioning. This allows, through examination of the results from the conducted training, to assess the extent to which the quality of the system satisfies its purpose.

The proposed methodology for assessment of the quality of the conducted training allows the system in which it is implemented to be analysed, and the application thereof may be used for establishing the manner in which the examined system functions, and if necessary, the respective actions for improvement to be undertaken.

The creation of a system for objective analysis and assessment of the conducted training process in higher educational institutions will provide the opportunity for taking the necessary actions for raising its quality, and this is directly related to the labour market prospects of the trainees. The more precise the developed technologies and methodologies for analysis of the conducted training are, the more accurate will be the picture which they create for the managers of the training courses regarding the drawbacks in its conducting, and the ways for solving the bottlenecks will be more effective (Petrov, 2018c).

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