Comprehensive methodology for evaluating the effectiveness of training the variable composition of the training center

Dmytro Vynokurov *[1 A]; Oleksandr Heorhadze [2 A]

*Corresponding author: [1] Ph.D. student, e-mail: dunay1903@gmail.com, ORCID: 0000-0002-1342-4393
[2] PhD, Deputy head of the Department of troops (forces) management in peacetime, e-mail: alexx0508@ukr.net, ORCID: 0000-0002-9306-6660

[A] National Defence University of Ukraine named after Ivan Cherniachovskyi, 28, Povitroflotsky, ave, Kyiv, 03049, Ukraine

Received: June 12, 2021 | Revised: June 22, 2021 | Accepted: June 30, 2021

DOI: 10.5281/zenodo.5071081

Abstract

Radical changes in the nature of modern military conflicts, the dynamic development of armaments and military equipment, the emergence of new forms and methods of armed struggle necessitate a revision of approaches to training and education of servicemen, which aims to master the full range of competencies in their military activities. This requires the search, justification and implementation of new approaches to the training of specialists in training centers, which in turn requires the use of appropriate scientific and methodological apparatus to assess the effectiveness of their training. Based on the scientific and methodological apparatus for evaluating the effectiveness of training and experience in the training center, the article describes a comprehensive method for evaluating the effectiveness of training variable training center, which is based on the calculation of multicriteria dimensionless evaluation, which allows not only to evaluate training results but and take into account many other factors that contribute to or hinder this process. The partial indicators that have a direct impact on the effectiveness of the training of the variable composition of the training center include: the level of organization of training of training subjects and the level of competencies of students. This comprehensive methodology allows you to quantify the effectiveness of the training of variable staff of the training center, as well as to identify problematic issues during its preparation and implementation, which necessitates the development of recommendations. The results of the study can be used by training subjects in the assessment of competencies of variable staff in training centers, during the organization of training, as well as in further research in this area in research institutions.

Key words: variable composition, educational process, assessment indicators, training subjects, training programs, planning, competencies.

Introduction

Negative changes in the military-political situation in the world, the preservation of the real threat to the territorial integrity and sovereignty of Ukraine necessitate the search for and introduction of effective ways to improve the training system of the constituent forces of the state defense. The increase in the number and complexity of combat missions, the emergence of modern means of armed struggle, the improvement of forms and methods of using troops (forces) make increasing demands on the training system, which encourages the search for ways to reform and optimize. One of the components of troop training is staff training, which includes the training of specialists in training centers. The purpose of staff training in the training center is the formation, maintenance and development of professional competencies, as the main criterion for readiness to perform duties. This encourages the search for and implementation of new approaches to the organization and training of shift staff in training centers. Therefore, there is a need for a scientific justification of a comprehensive methodology for evaluating the effectiveness of training variable staff in the training center, which indicates the relevance of the topic under consideration.

Material and methods

Analysis of the previous research and publications in this area (Piekhota, S., Heorhadze, O., Kharabara, V., 2021; Heorhadze, O., Makalish, O., 2016; Hrom, V., Heorhadze, O., Yakimenko, I., 2016; Heorhadze, O., Ctolynets, S., Yuriev, O., 2019; Heorhadze, O., Kharabara, V., 2019; Heorhadze, O., Barhylevych, A., 2020; Hohoniants, S., Heorhadze, O., Rudenko, E., 2020; Vynokurov, D., Heorhadze, O., 2020; Heorhadze, O., Shevchuk, V., Pampukha, I., Nikiforov, M., Barhylevych, A., 2020) indicates that there is no single method for assessing the effectiveness of training variable training centers. The approaches that are available relate mainly to some components of training, or factors that directly affect its effectiveness.

Thus, in the previous article the author (Piekhota, S., Heorhadze, O., Kharabara, V. 2021) a methodical approach to assessing the level of training of tactical aviation brigade personnel.

The analytical dependences offered in the article (Heorhadze, O., Ctolynets, S., Yuriev, O. 2019) allow taking into account the influence of training leaders on the quality of combat coordination activities in the artillery brigade.

In the article (Hohoniants, S., Heorhadze, O., Rudenko, E.2020) analyzes the architecture and classification of expert training systems for the training of military specialists, which can be used for their training.

These articles (Heorhadze, O., Kharabara, V. 2019; Vynokurov, D., Heorhadze, O. 2020) present an approach to assessing the competencies of servicemen.

The paper (Hrom, V., Heorhadze, O., Yakimenko, I. 2016) presents a methodical approach to assessing the level of motivation of servicemen during combat training. The articles (Heorhadze, O., Barhylevych, A. 2020; Heorhadze, O., Shevchuk, V., Pampukha, I., Nikiforov, M., Barhylevych, A. 2020) set out the procedure for evaluating the effectiveness of training a separate territorial defense brigade.

In the article (Kamalov, E., Heorhadze, O. 2020) developed a method for assessing the level of readiness of educational institutions for military training of citizens according to the program of reserve officers.

At the same time, the scientific and methodological apparatus developed by its predecessors is a basic basis for further improvement and can be used in part in assessing the effectiveness of training variable staff of training centers.

Thus, the aim of the article is to develop a comprehensive methodology for evaluating the effectiveness of training variable training centers.

Results and discussion

The training of variable staff in the training center is a complex and multifaceted category, so to obtain a rational option for evaluating its effectiveness; you need to apply a systematic approach, which involves multi-criteria evaluation. Thus, the assessment will be characterized by multi-criteria functional dependence, which will be determined by the most significant indicators, which may differ in nature, direction and intensity of impact. This will ensure greater accuracy of assessment.

During the preparation of the variable composition in the training center, many tasks are solved and many functions are implemented, which at different stages of operation have different significance and differently affect the generalized indicator.

Therefore, the generalized indicator of evaluation of the effectiveness of training of variable staff in the training center should meet the purpose of the study, contain a set of components of training, as well as respond to the influence of factors, is be adequate.

The physical content of the generalized indicator should indicate the degree of achievement of the ultimate goal of training servicemen of variable composition in the training center - readiness to perform tasks in a particular military accounting specialty.

Thus, the main criterion for the effectiveness of training of servicemen of the variable

composition of the training center should be chosen dimensionless value $W_{\text{ЕП}}(t)$, to which we assign the characteristics described above for discrete time t. This value is chosen as a generalized indicator, with which we will determine the level of readiness of servicemen of the variable composition of the training center to perform tasks in the military accounting specialty.

Generalized indicator, the level of readiness of servicemen of the shift staff of the training center to perform tasks in a certain military accounting specialty for which they study $W_{ЕП}(t)$ is probabilistic, so we take its value in the range from 0 to 1 which can be written as:

$$0 < W_{ЕП}(t) \leq 1 \quad (1)$$

It is proposed to have a system of indicators, which will consist of a generalized indicator, partial indicators and indicators of lower levels, which are also probabilistic, so their values are also taken in the range from 0 to 1.

The partial indicators are proposed to include: "the level of organization of training by the subjects of training", "the level of competencies of variable composition".

Each of the partial indicators consists of a set of indicators that characterize and disclose their physical content and will determine the appropriate level of dimensionless quantity.

Given that the organization of training directly affects the level of competencies, and therefore their indicators are highly correlated, the assessment of the effectiveness of training variable staff of the training center $W_{ЕП}(t)$ it is offered to calculate by means of the normalized multiplicative aggregation:

$$W_{ЕП}(t) = M_{Оp}(t)^{q_{ор}} \cdot M_{К}(t)^{q_{к}} \quad (2)$$

where $M_{Оp}(t)$ – the level of organization of training by the subjects of training on time t;

$M_{К}(t)$ – the total level of competencies of the variable composition for time t;

$q_{ор}, q_{к}$ – weighting factors of importance of partial indicators.

The procedure for assessing the partial indicator of the level of competencies of the variable composition of the training center was published by the authors in the previous article.

Assessment of the level of training organization $M_{ор}(t)$ it is proposed to determine by partial indicators that take into account the activities of training entities aimed at well-thought-out, planned, systematic and comprehensively provided training and education of training facilities. Thus, the main indicators that characterize the level of training organization include: training planning, training resources and methodological activities of training entities.

Given that the planning of training does not depend on its resources and methodological activities, and therefore their indicators are not dependent on each other, to assess the level of organization of training, $M_{ор}(t)$ it is proposed to use additive aggregation:

$$M_{\text{ор}}(t) = L_{\text{пл}}(t) \cdot q_{\text{пл}} + L_{\text{рз}}(t) \cdot q_{\text{рз}} + L_{\text{мд}}(t) \cdot q_{\text{мд}} \quad (3)$$

where $L_{пл}(t); L_{рз}(t); L_{мд}(t)$ – indicators that characterize the level: planning of training, resource provision and methodological activities of the subject of training on time t;

$q_{пл}; q_{рз}; q_{мд}$ – weighting factors of importance of indicators $L_{пл}(t); L_{рз}(t); L_{мд}(t)$.

Assessment of the level of planning $L_{Пл}(t)$ it is proposed to determine the indicators that take into account the activities of the subjects of training, to determine the purpose and objectives of training, the order and sequence of agreed on the place and time of training activities, justification of resource needs for training.

The indicators that characterize the level of training planning in the training center include: Training plan $K_{План}(t)$ and Training programs for shifts of the training center $K_{Прог}(t)$.

Given that these indicators are strongly correlated, the assessment of the level of planning $L_{Пл}(t)$ it is offered to calculate by means of the normalized multiplicative aggregation:

$$L_{Пл}(t) = K_{План}(t)^{q_{план}} \cdot K_{Прог}(t)^{q_{прог}} \quad (4)$$

where $K_{План}(t); K_{Прог}(t)$ – indicators that characterize the quality of the Training Plan and the quality of the Training Programs of variable composition for the time being t;

$q_{план}; q_{прог}$ – weighting factors of importance of indicators$K_{План}(t); K_{Прог}(t)$.

The calculation of weighting factors was performed by the method of expert evaluation.

Partial indicator $K_{План}(t)$ it is proposed to determine the training plan by indicators:

precision$R_m(t)$ – which is characterized by the degree of detail of training measures by their logical construction and target orientation of training measures reflected in the Training Plan;

optimality $R_{опт}(t)$ – which is characterized as the ratio of the rational distribution of time allocated for training, the capacity of the training facilities and training load on the heads of classes;

reality$R_{реал}(t)$ – which is characterized by the degree of implementation of the planned training activities at a discrete point in time.

Given that the accuracy does not depend on the optimality and reality, so their indicators are not dependent on each other, to calculate the quality of the Training Plan $K_{План}(t)$ it is suggested to use additive aggregation:

$$K_{План}(t) = R_m(t) \cdot q_m + R_{опт}(t) \cdot q_{опт} + R_{реал}(t) \cdot q_{реал} \quad (5)$$

where $R_m(t); R_{опт}(t); R_{реал}(t)$ – indicators that characterize the level of accuracy, optimality and reality of the Training Plan for the time t;

$q_m; q_{опт}; q_{реал}$ – weighting factors of importance of indicators $R_m(t); R_{опт}(t); R_{реал}(t)$.

These indicators can have both equal and different significance or importance, so the appropriate “importance weight coefficients” will be used, which are calculated by expert evaluation.

The assessment of the level of “accuracy” $R_m(t)$ of the Training Plan is proposed to be determined by an indicator characterized by the degree of detail of training measures by their logical construction and target orientation of training measures reflected in the Training Plan and calculated by the formula:

$$R_m(t) = \sum_{h=1}^{H} Q_m(t) \cdot q_h, \quad (6)$$

where $Q_m(t)$ – coefficient of accuracy of working off of the m-th section (appendix) of the Training plan;

q_h – weighting factor of importance of the h-th section (appendix) of the Training Plan;

H – the number of sections (appendices) in the Training Plan.

That is, the accuracy factor of the h-th section (appendix) $Q_m(t)$and the weighting factor of the importance of the h-th section (appendix) $q_h$of the Training Plan will determine the contribution of the h-th section (appendix) in assessing the level of accuracy of the Training Plan.

The coefficient of accuracy of working out of the h-th section (appendix) of the Training plan $Q_m(t)$ is offered to be defined on experience of carrying out of planning of preparation in percentage. Let's assume that:

$Q_m(t) = 0{,}9$ – if the section (appendix) reveals the content of the planned activities, their logical construction and target orientation, taking into account the time for their implementation by at least 90%;

$Q_m(t) = 0{,}7$ – if the section (appendix) reveals the content of the planned activities, their logical construction and target orientation, taking into account the time for their implementation by at least 70%;

$Q_m(t) = 0{,}5$ – if the section (appendix) reveals the content of the planned activities, their logical construction and target orientation, taking into account the time for their implementation by at least 50%.

The assessment of the level of “optimality”$R_{опт}(t)$ of the Training Plan is proposed to be determined by an indicator, which is characterized as the ratio of rational distribution of time allocated for training, capacity of training facilities and training load on class teachers.

Given that the time allotted for training does not depend on the capacity of training facilities and training load on class teachers, and therefore their indicators are not dependent on each other, to calculate the level of “optimality” $R_{опт}(t)$of the Training Plan is proposed use additive aggregation:

$R_{опт}(t) = Y_ч(t) \cdot q_ч + Y_{пз}(t) \cdot q_{пз} + Y_{нн} \cdot q_{нн}$ (7)

where $Y_ч(t); Y_{пз}(t); Y_{нн}(t)$ – indicators that characterize the time allotted for training, the capacity of the training facilities and training load on the heads of classes on time t ;

$q_ч; q_{пз}; q_{нн}$ – weighting factors of importance of indicators $Y_ч(t); Y_{пз}(t); Y_{нн}(t)$.

The indicator of the level of reality of the Plan $R_{реал}(t)$is proposed to be calculated according to the functional dependence, which takes into account the level of implementation of the h-th training measure reflected in the Plan at a discrete point in time:

$$R_{реал}(t) = \sum_{h=1}^{H} Q_{реал}(t) \cdot q_h \qquad (8)$$

where $Q_{реал}(t)$ – the coefficient of implementation of the h-th training event reflected in the Training Plan;

q_h – weighting factor of importance h-th training event;

H – the number of training activities reflected in the Training Plan.

That is, the coefficient of implementation of the h-th training event $Q_{реал}(t)$and and the "weighting factor of importance" h-th of the training event q_h will determine the contribution of the h-th training event in assessing the level of implementation of training activities reflected in the Training Plan.

The coefficient of implementation of the h-th training event reflected in the Training Plan $Q_{реал}(t)$ is proposed to be determined by the experience of training variable staff in the training center Let's assume that:

$Q_{реал}(t) = 0{,}9$ – if the planned activities reflected in the Plan are performed by at least 90%;

$Q_{реал}(t) = 0{,}7$ – if the planned activities reflected in the Plan are performed by at least 70%;

$Q_{реал}(t) = 0{,}5$ – if the planned activities reflected in the Plan are performed by at least 50%;

Determination of weights of importance q_h , h-th training event is carried out by expert evaluation using the method of pairwise comparisons.

Substituting the value of the coefficient of implementation of the h-th training event $Q_{реал}(t)$ and importance weight q_h in formula (8), it is possible to find the value of the level of reality of the implementation of training activities reflected in the Training Plan for a discrete time.

It is proposed to assess the level of the Training Program $K_{Прог}(t)$ by the following indicators:

targeted guidelines of the program $Z_{цн}(t)$ – which is characterized by the reflection of clearly defined goals and expected learning outcomes, the disclosure of the qualification profile of each military accounting specialty, which meets the needs and requests of customers for training;

structure of the program $Z_{ст}(t)$ – which is characterized by the reflection of the structural and logical scheme of the training process for certain specialties, a brief description of the modules (courses) in which the relevant knowledge, skills and abilities are acquired. Clear formulation of the forms and methods of teaching used, rational distribution of study time by type of classes with justification of their feasibility for the formation of appropriate competencies in students;

assessment system – $Z_{оц}(t)$ which is characterized by a clear, understandable and transparently formulated assessment system, which allows impartial, objective testing of knowledge, skills and abilities of students. The description of control measures (current, modular, final) is made clear with the disclosure of evaluation procedures.

Since the target guidelines do not depend on the structure of the program and the evaluation system, so their indicators are independent of each other, to assess the quality of training programs, $K_{Прог}(t)$ it is proposed to use additive aggregation:

$$K_{Прог}(t) = Z_{цн}(t) \cdot q_{цн} + Z_{ст}(t) \cdot q_{ст} + Z_{оц}(t) \cdot q_{оц} \qquad (9)$$

where $Z_{цн}(t); Z_{ст}(t); Z_{оц}(t)$ – indicators that characterize the target guidelines, structure and evaluation system of the Time Training Program;

$q_{цн}; q_{ст}; q_{оц}$ – weighting factors of importance of indicators $Z_{цн}(t); Z_{ст}(t); Z_{оц}(t)$;

It is proposed to assess the level of resource provision of training by indicators that take into account the adequacy of the training material and technical base and the resources allocated for training.

Since the provision of training material and technical base does not depend on the allocated resource for training activities, and therefore their indicators are not dependent on each other, to assess the level of resource provision of training, $L_{рз}(t)$ it is proposed to use additive aggregation:

$$L_{рз}(t) = K_{нмтб}(t) \cdot q_{нмтб} + K_р(t) \cdot q_р \quad (10)$$

where $K_{нмтб}(t); K_р(t)$ – indicators that characterize the level of training of training facilities and resources allocated for the time;

$q_{нмтб}; q_р$ – weighting factors of importance of indicators $K_{нмтб}(t); K_р(t)$.

Indicator "provision of the military unit with training material and technical base" $K_{нмтб}(t)$ characterized by the suitability and ability of the objects of educational material and technical base to provide training of variable staff according to training standards.

The training material and technical base used during the training activities includes field training $Q_{пол}(t)$, barracks $Q_{пр}(t)$ and company training material and technical base $Q_р(t)$, which is taken as indicators.

Thus, the level of training material and technical base $K_{нмтб}(t)$ is calculated depending on:

$$K_{н.мтб}(t) = Q_{пол}(t) \cdot q_{пол} + Q_{пр}(t) \cdot q_{пр} + Q_р(t) \cdot q_р \quad (11)$$

where $Q_{пол}(t); Q_{пр}(t); Q_р(t)$ – indicators that characterize the ability of training facilities of the field, barracks and company training facilities to ensure the training of servicemen of the shift of the training center for the time being t;

$q_{пол}; q_{пр}; q_р$ – weighting factors of importance of indicators $Q_{пол}(t); Q_{пр}(t); Q_р(t)$.

Calculation of values of indicators $Q_{пол}(t); Q_{пр}(t); Q_р(t)$ carried out according to the dependencies that take into account their available number from the total number determined by the relevant regulations:

$$Q_{пол}(t) = \frac{\sum_{d=1}^{D_н} H_{полd}(t) \cdot q_d}{\sum_{d=1}^{D_з} H_{полd}(t) \cdot q_d} \quad (12)$$

$$Q_{пр}(t) = \frac{\sum_{d=1}^{D_н} H_{прd}(t) \cdot q_d}{\sum_{d=1}^{D_з} H_{прd}(t) \cdot q_d} \quad (13)$$

$$Q_р(t) = \frac{\sum_{d=1}^{D_н} H_{рd}(t) \cdot q_d}{\sum_{d=1}^{D_з} H_{рd}(t) \cdot q_d} \quad (14)$$

where $H_{пол}(t); H_{пр}(t); H_р(t)$ – indicators that characterize the number of training facilities in the field, barracks and company training facilities in the training center at the time t;

q_d – the coefficient of weight of the importance of the d-th educational object of the field, barracks and company training material and technical base;

$D_н$ – the number of training facilities in the field, barracks and company training facilities capable of training a serviceman according to training standards;

$D_з$ – the total number of training facilities in the field, barracks and company training facilities is determined by the relevant regulations.

The indicator "resources" $K_р(t)$ characterizes the provision of the training center with material and technical means and finances, which are allocated for training activities.

Since the provision of material and technical means does not depend on funding, and therefore their indicators are not dependent on each other, to assess the level of resource provision of training $K_{рз}(t)$, it is proposed to use additive aggregation:

$$K_{рз}(t) = B_{ммз}(t) \cdot q_{ммз} + B_ф(t) \cdot q_ф, \quad (15)$$

where $B_{ммз}(t); B_ф(t)$ – indicators that characterize the level of training with material and technical means and finances for the time$t$;

$q_{ммз}; q_ф$ – weighting factors of importance of indicators $B_{ммз}(t); B_ф(t)$.

Calculation of the value of the indicator "provision of training measures with material and technical means" $B_{ммз}(t)$ it is proposed to carry out depending, depending on the available number of material and technical means used during the training activities with their necessary needs, taking into account the

importance of the x-th type of material and technical means:

$$B_{МТЗ}(t) = \frac{\sum_{x=1}^{X_в} Q_x(t) \cdot q_x}{\sum_{x=1}^{X_н} Q_x(t) \cdot q_x} \quad (16)$$

where $Q_x(t)$ – an indicator that characterizes the number of x-th types of material and technical means in the training center at a discrete time t;

q_x – weights of importance x-th type of material and technical means;

$X_в$ – the number of material and technical means used during the training activities;

$X_н$ – the total number of material and technical means necessary for the quality of training activities in accordance with the rules of provision defined by the governing documents.

Calculation of the value of the indicator "training funding" $B_ф(t)$ It is proposed to carry out, depending on the actual financing of expenditures on items for training on the necessary needs:

$$B_ф(t) = \frac{\sum_{h=1}^{H_ф} Q_h(t) \cdot q_h}{\sum_{h=1}^{H_з} Q_h(t) \cdot q_h} \quad (17)$$

where $Q_h(t)$ – an indicator that characterizes the number of h-th items of expenditure at a discrete point in time t;

q_h – weighting factor of the$h$-th item of expenditure on training;

$H_ф$ – the number of actually funded training items;

$H_з$ – the total number of items of expenditure on training.

It is proposed to assess the level of methodological activity of the subjects of training by an indicator that takes into account the level of methodological skills of class teachers and the level of information and methodological support of the educational process in the training center.

As methodical skill of heads of employment does not depend on information – methodical maintenance, and consequently their indicators are not dependent on each other, for an estimation of a level of methodical activity $L_{мд}(t)$ it is suggested to use additive aggregation:

$$L_{мд}(t) = K_{мм}(t) \cdot q_{мм} + K_{імз}(t) \cdot q_{імз}, \quad (18)$$

where $K_{мм}(t); K_{імз}(t)$ – indicators that characterize the level of methodological skills of class teachers and the level of information - methodological support in the training center at the time t;

$q_{мм}; q_{імз}$ - weighting factors of importance of indicators $K_{мм}(t); K_{імз}(t)$.

Calculation of the value of the indicator "methodical skill of class teachers" $K_{мм}(t)$ it is proposed to determine the dependence that takes into account his professional competencies (knowledge and skills), direct participation in methodological activities (meetings, seminars, conferences, classes (instructional, methodical, demonstration)), the availability of retraining and advanced training courses.

As the specified indicators do not depend on each other, for an estimation of a level of methodical skill of heads of employment it is offered to use additive aggregation:

$$K_{мм}(t) = \sum_{j=1}^{J} K_{ммj}(t) \cdot q_j; \quad \sum_{j=1}^{J} q_j = 1, \quad (19)$$

where $K_{мм}(t)$ – level of methodical skill of the head of the lesson at a discrete moment of time: "level of professional competence" $K_{пк}(t)$, "Direct participation in methodological activities" $K_{мз}(t)$, "Availability of retraining and advanced training courses" $K_к(t)$;

q_j – weighting factor of importance of indicators $K_{ммj}(t)$.

J – the total number of class teachers in the training center.

Assessment of the level of professional competence j-th lesson leader $K_{пк}(t)$ it is proposed to determine the dependence, which takes into account the level of his theoretical knowledge and practical skills.

$$K_{пк}(t) = \sum_{y=1}^{2} B_{пкj}(t) \cdot q_y \quad (20)$$

where $B_{пкj}(t)$ – indicators that characterize the level of professional competence$j$-th lesson leader in the field of activity for a while:

"Theoretical knowledge" $B_{тзj}(t)$, "Practical skills" $B_{пуj}(t)$;

q_y – weighting factors of importance of indicators $B_{пкj}(t)$.

Indicator participation in methodological activities $K_{мз}(t)$ j-th the head is characterized by the number of activities that are carried out directly with the head of classes in order to improve his methodological skills. The calculation is proposed to be made depending on:

$$K_{мз}(t) = \sum_{f=1}^{F} F_f\,(t) \cdot q_f \qquad (21)$$

where $F_f(t)$ – indicators of methodical measures (meetings, conferences, seminars, instructive-methodical and demonstration classes), which were held with the supervisors of classes for a while in order to improve his methodical skills;

q_f – weighting factors of importance of indicators $F_f(t)$.

Calculation of values of indicators $F_f(t)$ is carried out according to the dependencies that take into account the number of activities carried out on the total number that is planned:

$$F_f(t) = \frac{\sum_{d=1}^{D_П} H_{fd}(t)\cdot q_d}{\sum_{d=1}^{D_З} H_{fd}(t)\cdot q_d}, \qquad (22)$$

where $H_{fd}(t)$ – indicators that characterize the number d-th methodical events (meetings, conferences, seminars, instructional and demonstration classes) on time t;

q_d – coefficient of weight of importance of the d-th methodical measure;

$D_П$ – the number of methodological activities;

$D_з$ – the total number of planned methodological activities.

Indicator "availability of retraining and advanced training courses" $K_к(t)$ j-th the head of classes is characterized by the presence of retraining and advanced training courses in the direction of his activity. For evaluation, the scale used is shown in table 1.

To translate the score in points to a dimensionless value, use the expression:

$$K_к(t) = \frac{X_p}{5} \qquad (23)$$

Table 1 – Assessment of the availability of leaders in the field of its activities

Passing of advanced training courses	Rating in points
during the last year	5
for two years	4
for three years	3
for four years	2
over four years	1
did not participate	0

Where X_p – assessment in points of availability of retraining and advanced training courses for the serviceman in the direction of his activity.

Assessment of the level of information and methodological support is proposed to determine the indicator $K_{\text{імз}}(t)$ which takes into account the availability of educational, methodological and other educational materials developed in the NC, which contribute to the effectiveness of training and training activities. The calculation is proposed to be made depending on:

$$K_{\text{імз}}(t) = V_{нп}(t)\cdot v_{нп} + V_{н.мр}(t)\cdot v_{н.мр} + V_{мр}(t)\cdot v_{мр} \qquad (24)$$

where $V_{нп}(t); V_{нмр}(t); V_{мр}(t)$ – indicators, availability of the developed information-methodical material: textbooks, educational-methodical developments, methodical recommendations on preparation and carrying out of current, modular and final control for time t;

$v_{нп}; v_{нмр}; v_{мр}$ – weighting factors of iimportance of indicators $V_{нп}(t); V_{нмр}(t); V_{мр}(t)$.

Calculation of values of indicators $V_{нп}(t); V_{нмр}(t); V_{мр}(t)$ carried out according to the dependencies that take into account the amount of developed educational and methodological material from the total number required for quality training:

$$V_{нп}(t) = \frac{\sum_{d=1}^{D_р} H_{нпd}(t)\cdot q_d}{\sum_{d=1}^{D_З} H_{нпd}(t)\cdot q_d} \qquad (25)$$

$$V_{нмр}(t) = \frac{\sum_{d=1}^{D_р} H_{нмрd}(t)\cdot q_d}{\sum_{d=1}^{D_З} H_{нмрd}(t)\cdot q_d} \qquad (26)$$

$$V_{мр}(t) = \frac{\sum_{d=1}^{D_р} H_{мрd}(t)\cdot q_d}{\sum_{d=1}^{D_З} H_{мрd}(t)\cdot q_d} \qquad (27)$$

Conclusions

Thus, the article developed a comprehensive method for assessing the effectiveness of training variable staff in the training center, which allows to take into account the impact of training subjects on training with training facilities, based on the choice of a new set of indicators characterizing the quality of training. training projects and the level of competencies of the changing staff of the training center.

The results of the study can be used by training subjects in the assessment of competencies of variable staff in training centers and in the organization of their training, as well as in further research on this issue in research institutions.

Prospects for further research in this area may be to substantiate recommendations for improving the efficiency of training variable staff in the training center.

References

Hrom, V., Heorhadze, O., Yakimenko, I. (2016) Methodical going is near evaluation of level of motivation of servicemen of the armed forces of Ukraine. *Research papers collection of the Center of military and strategic studies of the National Defense University of Ukraine by Ivan Cherniakhovskyi*, 57(2), 67-70. DOI: 10.33099/2304-2745/2016-2-57/67-70 (In Ukrainian).

Heorhadze, O., Ctolynets, S., Yuriev, O. (2019) Partial methodology for assessing the methodological training level of classes' leaders during conducting the combat coordination of an artillery brigade. *Modern information technologies in the field of security and defence*, 2(35), 155–158. DOI: 10.33099/2311-7249/2019-34-1-155-158 (In Ukrainian).

Heorhadze, O., & Kharabara, V. (2019). Partial method of assessment of tank brigade preparedness level during combat readiness recovery. *Journal of Scientific Papers «Social Development and Security»*, 9(4), 131-142. DOI: 10.33445/sds.2019.9.4.10, (In Ukrainian).

Vynokurov, D., & Heorhadze, O. (2020) Partial methodology for assessing the younger specialists' competence level in the training center. *VUZF review*, Vol. 5, № 1, 50-53. DOI: 10.38188/2534-9228. 20.1.07 (In Bulgarian).

Heorhadze, O., & Barhylevych, A. (2020) Separate brigade of territorial defence level of training organization assessment methodology. *Political Science and Security Studies Journal*, 1(1), 71-75. DOI: 10.5281/zenodo.4399732 (In Poland).

Hohoniants, S., Heorhadze, O., Rudenko, E. (2020) Architecture and classification of expert-educational systems fortraining of military specialists. *Modern information technologies in the field of security and defence*, 2 (38), 133–138. DOI: 10.33099/2311-7249/2020-38-2-133-138 (In Ukrainian).

Heorhadze, O., Shevchuk, V., Pampukha, I., Nikiforov, M., Barhylevych, A. (2020) Justification of the overall indicator for the estimation of effectiveness of training of a separate territorial defense brigade of the armed forces of Ukraine. *Collection of scientific works of the Military Institute of Kyiv National Taras Shevchenko University*. № 68, 100-109. DOI: 10.17721/ 2579-481X/2020/ 68-11 (In Ukrainian).

Kamalov, E., & Heorhadze, O. (2020). Methods for assessing the level of readiness of an educational institution for military training of citizens according to the program of reserve officers. *Political Science and Security Studies Journal*, 1(2), 90-97. DOI: 10.5281/zenodo.4521176 (In Poland).

Piekhota, S., Heorhadze, O., Kharabara, V. (2021). Partial methodology for assessing the level of learning of tactical aviation brigade personnel. *Political Science and Security Studies Journal*, 2(1), 68-73. DOI: 10.5281/zenodo.4818549 (In Poland).