Preparation and training of people to the profession in challenging conditions

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Abstract: This paragraph deals with selected issues related to trends in the education of professionals for modern security environment. It presents some principals connected with developing of training models of professional soldiers and commanders.

Key Words: Complex models, military professional skills, subtle skills, psychophysical and mental fitness.

1 Introduction:
Development of the modern security environment linked to the evolution of human knowledge, technical development and application of new technologies into activities in the society defense and security. This development and application put specific demands on the quality of skills and changes in the approaches and models of training of military professionals who have to perform specific functions and activities in the security environment.

2 Modern Security Environment
Modern security environment in the context of the implementation of the concept of NATO Network Enabled Capability1 (NNEC hereinafter) and in connection with the use of sophisticated weapons and technology exhibits following characteristics from the point of view of its development:

a) Growing emphasis on synchronization and synergy in the performance of specific activities and functions providing in systems that ensure the protection, defense and security of individuals and communities.

b) Growing emphasis on the ability of individuals and micro-teams (crew, team, service) to make independent decisions and act, and the ability to collaborate, share information and create knowledge for effective decision making and action.

Alongside the emphasis on the ability to act synergistically and synchronize functions and operations of systems in a changing modern security environment, is constantly growing the importance of abilities associated with problems of asymmetric effect. Asymmetric procedure is connected with proactivity, symmetrical (linear) procedure with reactivity and relates to efficiency of operations in the course of development of conflict or mission situations. For the modern security environment emphasizing proactivity, asymmetry and the aforementioned characteristics is not enough only mental and physical endurance or condition or will and motivation of the individual. In terms of preparing people asymmetric effect is related to the quality requirements of such military professionals and leaders, such as critical and creative thinking, mental condition, and another related to cognition, decision-making and actions of individuals and commanders (Taleb, NN 2013; p. 93 - 106; Saliger, R., Pindešová, E., Pokorný, V., 2010). There are different ways to create and improve the skills of professionals and commanders associated with the application of synergetic effect, proactivity and implementation and management of asymmetric operations. For example, you can prepare to apply the concept of "janusov" thinking (Paparone, CH,
CRUp, JA, 2002) or principles of cognitive continuum\(^2\) by KR Hammond. Comprehensive approaches also enable to solve the growing importance of the human factor in terms of the requirement of the quality of individual skills - professional and military commander, and the growing importance of quality of human system (microteam). In the context of comprehensive approaches can be efficiently applied systemic and holistic approach, which enables to work on developing the quality of a particular individual, and on its ability to act in a professional human system and dynamically evolving environment of situation. Systemic and holistic approach understands the combat system (eg. Group of units, unit) so that each part (individual, microteam - crew, team, staff) decides and act in every moment of the process of solving the task or mission execution, as a whole, in which is included. This requires from models and processes of preparation, cultivate for each member (as well as microteams), learning to learn and ability to act proactively and autopoietically, though continuously consciously and reflectively process experience, update and create knowledge, make decisions and act appropriately, in relation to changes in the internal environment and the external environment situations (missions) in accordance with the achievement of mission objectives.

Military professional and commander for the modern security environment must be able to handle not only modern technology, including information and communication technologies, but also independently and responsibly make decisions and act in a particular situation mission that can have different contexts and goals. In terms of survival of the individual and fulfill the functions of the fight, you must be able to move between the highest levels, which presents a modern sophisticated technologies (artificial environment\(^3\)) and levels which represent the basic, natural potentials and capabilities of individual units (crew - microteam) and mission environments, so do without modern technology, communication and information systems and their support (natural environment\(^4\)). It must also be able, in terms of decision making and action, move both in the social environment hierarchically controlled and in a team environment (network-centric model) and must also be able, in certain situations, make decisions independently and completely independently act. In terms of the above it puts modern security environment new requirements on the quality of skills of each military professional and military - professional system (microteam) and their preparation, in the sense that:

a) It puts emphasis on the specialization (expertness) of individuals for the area, function or activity, and the multifunctionality of the military professional (eg. in terms of substitutability among microteam) while maintaining the requirement for its ability to perform tasks in their natural environment and "primitive" conditions.

b) It also extends the range of capability requirements of the military professional and commander for skills associated with the use of modern, highly sophisticated technologies, whether in the form of weapons or communications and information systems for support of decision making, command and control. This puts emphasis on changing the people's minds, which is the basis of effective use of the potential of modern technology, the realization of effect of synergy, synchronization, asymmetry and proactivity.

The implementer of these requirements is not an individual alone, but strategic carrier of changes are systems, models and processes that performs the functions of preparation, though education and training, their ability to conceptually form, modify and upgrade the existing training of military professionals and commanders in relation to the above mentioned changes to the requirements, and in a further development of the principal characteristics of modern security environment.


\(^3\) The term artificial environment we use for such conditions performance functions and activities in the security environment, which are determined by the dominant use of modern technology in fulfilling tasks of the mission. An example is the organization of operations and implementation of combat operations from a remote location, using unmanned aerial vehicles, robots and other sophisticated weapons and equipment, including communications and information technology, satellites, use of artificial intelligence to analyze the situation, predicting the development, decision-making processes and models, etc.

\(^4\) The term we use the natural environment for such conditions to exercise the functions and activities in the security environment, which are determined by limiting or even absence of the possibility of using modern technology in carrying out the tasks of the mission. Whether it is a failure of technology, logistics, information transmission respectively, lack of information, or the style of combat tactics and strategy of adversary, or direct attack and fight face to face.
In order to efficiently create and produce required skills, following the trends of principal characteristics of modern security environment, you need to prepare people for the fulfilling functions and activities in this environment, take into account that the basic, natural resource of potential of the armed forces is mental potential which naturally possess every individual. The importance of all training systems of military professionals is their ability to build this potential, though to identify, cultivate and develop in every individual. In this context, comes to the fore particularly the role of military colleges and universities, differing from the training centers or educational centers, whose purpose is to impart basic knowledge and develop basic skills for joining the professional environment and possibly contribute to mastering skills for some specialization. These centers, however, cannot replace the function and role of colleges or even universities. Military colleges and universities in particular, as "places of research and learning, which have a close relation to practical life and the needs of the state" (Liessmann, 2012, p. 81) if they are to fulfill their function, must behave like systematizing and cultivating environment, though:

a) To create systematic conditions for quality education of students, the creation and transmission of new knowledge related to expertise of military profession and systematic military science.

b) To make conditions for the cultivation of critical thinking, implicit and highly professional knowledge and meta-abilities related to the mastery of the profession and the military arts.

Besides, they must also have the ability to identify trends in the security environment in the development of military science and art, and the ability to create new models and effective methodologies of training of military professionals and commanders so that, for example, military training and educational centers were on their base able to respond effectively to changing conditions. New methodologies and models used in the systems of education and training of military professionals and commanders must currently include:

a) Preparation of artificial, non-contact environment interactions, including command and control through modern technology.

b) Preparation for natural contact environment containing an increased emphasis on psychophysical condition, specific military-vocational skills, using both basic natural conditions and possibilities by military professionals and highly sophisticated weapons and technology.

The presence of these two parameters in terms of methodology deserves far more attention than it has in the presence. It is a fact that requires a change of principles and approaches used to create models and methodologies. For example, if you will apply mainly the analytical approach in understanding mental functions and potentials of the human mind and by how it is set by the current trend then they will support the competencies associated with artificial environment and use of modern technologies, including information and communication that apply the concepts of artificial intelligence, artificial life or robotics whether in the form of Mechatronics or collaborative robotics. The consequence is next to risks fabrication of training that teaches individuals to use equipment and technology, but teach him to think (Spitzer, M. 2014), also the traps risk associated with the efficient and correct decisions that potentiate the effects of cognitive dissonance (Tavrisová, C., Aronson, E., 2012) and expertness11, as it mentions Taleb NN (2011) . It turns out that the potentials and competencies of military professionals, people and human systems (microteams) that are effective in managing dynamically changing and complexly evolving task situations in the natural environment, will remain in the models with the prevailing mechanistic, linear and analytical approach either undiscovered or underdeveloped or may cause their useless deformation. These problems we try to solve through complex models that apply a systematic approach and accept holistic and phenomenological aspects in practice preparation.

For more see Mařík, V., Štěpánková, O., Lažanský, J. 2001, p. 55, 76.


Experts among others by NN Taleb (2011) have too high self-confidence or even belief in knowledge and expert system, which is in terms of decision making under uncertainty, risk, and in terms of asymmetric exposure risky and restrictive.
3 Complex models in preparation of military professionals

Adapt the process of preparing the above mentioned requirements for target capabilities, pointing to the need to develop comprehensive approaches and models of training. This necessity is invoked by the characteristics of the military profession. Military environment, unlike other environments is made by activity and function performed by people so much that on one hand, specific and complex, on the other, it is possible to compare it with other occupations only with difficulty. In this sense, it is difficult to apply or take models of training used for preparing the professionals for this environment.

Complex models also respect and appreciate modern knowledge which are currently available about learning of the behavior of the brain. At first, because the brain is on the one hand, constantly evolving and learning on the other hand, has in terms of thinking - cognition and decision-making potentials that can be by an appropriate and therefore complex model let to come up and bring to bear, while the linearly oriented and reduced form of preparation are undetectable and instable. The pragmatic rule "use it or lose it" is valid, what we do not use, we lose (Doidge, N. 2012, p. 48, 63). It turns out that the background of effective models and methodology training of military professionals, commanders and microteams must be incorporated principles that allow you to:

a) Meet the basic characteristics of the human brain, which is the tendency to continuous learning.

b) Create the necessary professional competence to perform combat and other tasks in natural conditions of the security environment.

c) To use modern techniques and technology, but also to think critically and make decisions, not only with the help of technology and development in the context that determines rather artificial environment and trends in the understanding of intelligence and artificial intelligence. In practice is valid both, claim of M. Spitzer: “Who lets other think for himself” (or technology note of authors), will never become an expert (Spitzer, M. 2014, p. 17), and the fact that if an individual becomes accustomed "to consume" prepared knowledge, it takes more time to learn how to create them, for example, if fail systems, that produce this knowledge or store and distribute it.

Approaches and models in the preparation of professionals and leaders, which is in the view of the above mentioned useful to be addressed are multidisciplinary, have higher levels of complexity, focus, whether in the first or second level, on the transformation of individuals thinking in terms of developing the ability to generate knowledge, not only accept knowledge or reproduce it. What is really going on in the mind and thinking of the individual in the process of preparation is a matter of the transfer processes (form, method, relationship and environment - these you can affect), processing methods (algorithms, models, scenarios - you also can affect), understanding (those cannot be directly linearly and mechanistically influenced - it is an internal process that occurs in the learning system, and it does not matter whether they are individuals or microteams). The output is knowledge created by the individual from the actual experience and skill that is not only a reproductions or a composite of information or knowledge and drills, obtained at the "entrance" of preparation.

Modern comprehensive approaches12, based on practice and the development of modern security environment, allows focus attention on the quality included in the group of subtle skills13. These are the skills associated with thinking, cognition, decision-making and behavior of people when dealing with situations and fulfilling tasks in complex, dynamically changing conditions. They are involved for example on the ability to move in a continuum defined by routine and heuristic types of tasks in effective decision making and action, or command and control. Examples of subtle skills include mental potential - a mental condition14, and critical thinking.

- Mental fitness and mobility refers to the cognitive and decision-making optimum of individual in a situation tasks.

- Critical, creative and systematic thinking should not be interchanged for analytical

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12 Modern complex approaches include both stress on the external conditions (requirements of profession, situations tasks and so on) And take into account the internal layout and the natural qualities of the individual as a whole. In this sense they methodologically shape environment and the processes of preparation to achieve the maximum effect in terms of the prepared individual. Usually applies the concept of autopoiesis, system access, advanced knowledge of cognitive, behavioral and social sciences.


14 For more see Principy a metody Kognitivniho managementu in Saliger, R., Pindelsova, E., Pokorny, V. (2010).
thinking or ability to apply formal logic operations. These constitute only a partial segment of the entire range of processes that are in the process of cognition, decision-making and negotiation involved. The process of reasoning for correct decisions relates to mental mobility on the cognitive continuum and also requires use of emotion and intuition. This allows thinking as a process to be better applied not only in linear tasks, but also in heuristics or tasks that require decision-making under uncertainty, permanent change and transformation.

Complex models of training of military professionals for the security environment should involve not only the issue of optimal shaping of psychophysical and mental fitness, but also a systemic approach and the concept of autopoiesis. Creation of such training models is not simple and resembles a project managing. In this sense emerge the foundations of the X-stream at the University of Defense. The core of the model is methodologically sophisticated set of disciplines of special physical preparation, cognitive and behavioral disciplines that complement and further develop tasks using individual universal army preparation, including behavior in combat, danger and survival situations, special firearms training (using point shooting method), etc. There are also implemented components of linear problems and heuristics, requiring both application of standard and non-standard decisions and creating of solutions.

Comprehensive preparation of military professionals cannot be just a matter of purely intuitive empiricists (practitioners) nor purely academic theorists, as well as it cannot be a matter of just one field, discipline or specialization of the department. Theoretical or practical training carried out on a linear causal mechanistic principles used in the past, does not appear, nor affect aspects of quality of abilities that can occur and affect complex approaches through complex models. It turns out that in addition to the need to pay attention to the preparation of physical and mental endurance increases significantly the need to focus on mental readiness, respectively cognitive skills not only in the sense so that an individual and team (unit) was able to keep abilities gained during the process of the preparation and can apply them in practice, but also in terms of:

- Ability and skills to transform and adapt them creatively to changing situational context (though learning to learn) in the process of performing tasks and achieving goals.
- Ability and skills to maintain their professional potential, not only during the performance of tasks (missions), but develop it during and after its completion (experiential knowledge). Therefore to be able not only to regenerate but also to creatively evaluate the experience and transform his profession competences, his potential.

From this perspective, the design of training of military professionals must include not only external aspect in the form of mastering and handling of concrete, specific skills (the classic example is the close combat or combat shooting), but also internal, personally developing, autopoietic and auto-regenerative aspect. Designing courses specifically designed according to the principles of the methodology of a comprehensive model X-Stream, for conditions of training of military professionals, presents for example following application of selected principles:

- Initial and ongoing diagnosis - identification of natural human abilities and their use for target acquisition and cultivation of skills, abilities. Permanent monitoring of the current condition of individuals, and changes in partial psychophysical, mental and social aspects.
- The principle of consistent internal external access. External access presents methodology the process of preparation and the task modification and their difficulty during the preparation in relation to the current level of the specific condition of the individual parameters and their evolution. Internal access represent in particular relationship of student to training and ongoing feedback, which presents the minimum necessary information (hot information) during training (from where to where to continue, where are they set and why) for individual reflection and processing of experience. Emphasis is placed on the results reflection and not on the evaluation or focusing on mistakes and analyze of the possible causes of performance deviations from the optimum.

4 Anecdotal evidence of the application of the methodology of the complex model

It is confirmed that a meaningful time span of courses ranges from 4 to 6 days. It appears that the third day of intensive work has characteristics of complex modifications / changes in the individual and in terms of microteam in terms of positive adaptation and transformation, for example in terms of potential development of individual, dysadaptace conversely, in terms of occurrence of indicators of depletion or degradation of the quality of performance in the decision-making processes etc.

It turns out that the results in the form of certain capabilities achieved by individual during courses of X-Stream type, have a higher potential in terms of duration in time (approximately 30% of the professional population).

It is also confirmed that individuals possessing higher levels of subtle skills quality for decisions and actions identified in the X-Stream (about 15% of the population), consistently achieve better quality of results in decision making and action in challenging situations than individuals with lower levels and even show more dynamic shift in personal professional careers in practice. Those military professionals can be considered as those who are, in terms of a combination of personal qualities and potentials that can be part of complex models to measure, better than the good ones, and represents of a gold core of the human potential of the armed forces. These professionals and commanders are characterized by:

- Think differently and dare to do what others do not dare, apply practically reflection, prefer skepticism and critical thinking. Work effectively and appropriately with the risk and make appropriate decisions under uncertainty and lack of information.
- Stands a different position in terms of dealing with situations and fulfilling role in cognition, decision-making and action. What others perceive and understand as the problems and limits, they perceive and understand as options. The boundaries and limits are moving, permeable and elastic for them.
- Their performance shows significant links between psychophysical response in the form of heart rate variability, and selected personality aspects that are manifested as:
  a) The ability to preserve the energy and maintain optimal psychophysical and mental condition.
  b) Ability to learn how to learn and "change" in the process of fulfilling the task.
  c) The abilities that create or invent new procedures that have not been part of the preparation and training provided.
  d) The ability to regenerate continuously quickly and efficiently potentials (manage to prevent fatigue and exhaustion).

5 Conclusion

Changes in the characteristics of the military profession for modern security environment require the application of the comprehensive approaches and models in preparation of professionals. These models allows you to create the part of military force potential that cannot be created by traditional preparation methods, nor can it be replaced by modern technology, and applications of modern communication systems, robotics or artificial intelligence.

References:


