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**Professional Culture of the Specialist of the Future**

**ANALYTICAL AND CRITICAL THINKING SKILLS  
OF CADETS AND POST-GRADUATE STUDENTS**

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***Abstract***

Cognitive skills such as analytical and critical thinking are important components of professional culture of the military personnel. Clear thinking, reasoning, problem solving and the military decision-making process are a cornerstone of military education. Advanced skills in counterterrorist analysis, threat assessment and preparation of tactics, techniques and procedures - all of these skills may help military professionals bring peace and stability to different groups of people and function effectively during peacekeeping and humanitarian operations. Contemporary military education undergoes significant changes and presupposes developing creative personality of the future officer. Nevertheless, educating a creative thinker takes time and effort. The authors advocate the ideas of R. Paul, L. Elder, and D. Halpern on analytical and critical thinking and focus attention on the learners' awareness of their cognitive skills. For this purpose a questionnaire, with descriptors of the levels of analytical and critical thinking skills taken from Reference Framework of Competences for Democratic Culture, was offered to cadets and post-graduate students of Ryazan Guard Higher Airborne Command School. The results of the study proved the hypothesis that post-graduate students have a higher level of analytical and critical thinking than the cadets of the 5<sup>th</sup> year of study. The collected data gave evidence of positive dynamics in the development of the studied skills. Naturally, in the course of study post graduate students have a specially designed curriculum, do their research and develop their cognitive skills and abilities to a higher level.

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**Keywords:** Professional culture, cadets, post-graduate students, analytical skills, critical thinking skills, self-assessment.



## **1. Introduction**

The world is changing at an increasingly rapid rate. The military leaders constantly witness new situations and have to make judgements, solve problems, and take important decisions. For military education as well as for any other professional education there is an increased demand for a new type of a military man, who can acquire new information efficiently, carry out multistep thinking operations under difficult circumstances, remain flexible enough to recognize the need for change in their professional development. Diane F. Halpern (2014) states wisely, “The twin abilities of knowing how to learn and knowing how to think clearly about the rapidly proliferating information that we must select from are the most important intellectual skills for the 21<sup>st</sup> century” (p.3).

Military educationalists recognize critical importance of developing analytical and critical thinking skills as the primary objective of professional education at all its stages as they are essential for the professional culture of a military officer. “We are living in the era of ‘wars of the haves versus the have-nots’ and now more than ever critical thinking seems to be a big part of what is missing from the societies we are trying to democratize” (Guillot, 2006, p.44). It is critical for a military professional to become a critical thinker, to learn the concepts, solve the problems and make decisions.

## **2. Problem Statement**

Although people have been thinking for all the history of the humanity, it was not till the 20<sup>th</sup> century that cognitive psychology developed into a separate science, which has been concerned with skills used in problem solving, reasoning and decision-making. Analytical and critical thinking can help a military professional recognize deliberate deception and concealment, consider the credibility of the information source, analyse arguments and find the best possible solution to the problem. Many people blame the Unified State Examination, which school leavers must take after finishing secondary school, for spoiling analytical and critical thinking of the youth. As a result, the importance of critical thinking development at higher institutions has increased. Naturally, we should pay more attention to developing these skills at higher education institution.

## **3. Research Questions**

- 3.1. Research question 1: Do cadets and post-graduate students in the military school realize the importance of analytical and critical thinking skills for a further successful professional activity?
- 3.2. Research question 2: What is cadets’ and post-graduate students’ self-assessment of their analytical and critical thinking skills?

## **4. Purpose of the Study**

The question of this study is, whether cadets and post-graduate students of the higher airborne command school realize the importance of developing their cognitive skills for the success in their professional activity. The aim of this paper is to analyze cadets and post-graduate students’ understanding of analytical and critical thinking skills in the context of their research and professional training at higher

military school. To avoid researchers' subjectivity we arranged cadets and post-graduate students' self-assessment. This kind of investigation serves as a source of awareness of the self and a better understanding of the current goals.

## **5. Research Methods**

The present study dwells upon the problem of developing analytical and critical thinking skills of cadets and post-graduate students in the process of doing research for their diploma papers, PhD theses and Doctoral dissertations at higher airborne command school. The study was founded on the axiological (Voevoda & Belogurov, 2018) and systematic (Kostin, Korchmin, & Salkova, 2018) methodological approaches to research and professional education. In the process of work, we used theoretical and empirical methods of study.

### **5.1. The theoretical methods**

The theoretical methods were represented by analysis, systematization and generalization of publications of Russian and international scientists on the problem of research. We studied the theory of critical thinking (Halpern, 2014; Paul, & Elder, 2013), the use of solving analytic tasks by intelligence analysts (Dhami & Careless, 2019), approaches to investigating students' critical thinking at higher education institutions (Roohr, Olivera-Aguilar, & Ling, 2019). We examined the need for critical thinking in the military educational system (Grigoras & Mustata, 2016) and the importance of critical thinking for military professionals (Guillot, 2006).

There is a large number of definitions of analytical and critical thinking skills. For the present research we use following definition by Halpern (2014): "Critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal directed—the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions, when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task" (p. 8).

Then, we tried to apply the main ideas of cognitive psychology to the context of professional culture. We investigated some problems and prospects of higher education system development in modern society (Avdeeva, Kulik, Kosareva, Zhilkina, & Belogurov, 2017) and the ways of preventing social conflicts in global developing world (Almazova, Khalyapina, & Popova, 2016). We observed innovative processes in military higher education (Baryshnikov & Korzhan, 2016) and investigated ways of improving the military vocational training of cadets at military institute (Bychenko & Balandina, 2019). We analyzed issues of professional culture of the military (Shevchenko, Bugrova, Cherniavskaya, & Kostikova, 2018) and dynamics of value orientations of cadets in military academies (Karlova, 2018). All of these ideas constructed the foundation for the experimental part of the research.

### **5.2. The empirical methods**

The empirical methods included: observation of the cadets and post-graduate students' academic activity; systematization of the authors' personal practical experience of future paratroopers' professional

training; informal talks and interviews; questionnaire; comparative data analysis. Reference Framework of Competences for Democratic Culture was used for developing a special questionnaire. To collect quantitative data we used Google Forms and sent on-line questionnaires to our respondents via e-mail in the Internet. We received questionnaires with different scores of opinions from 58 respondents. There were two groups of respondents. The first group included 36 cadets of the 5th year of study, aged about 22-24 years. The second group comprised post-graduate students of the military school, among them were 16 adjuncts of the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>d</sup> years of study, aged 36-42 years old, 4 PhD students, aged 25-37 years old, two doctoral students aged 38 and 40 years old, all being male and only one PhD student was female. All respondents were studying at Ryazan Guard Higher Airborne Command School. Participation in the questionnaires was anonymous and voluntary.

The data provided the material for comparative analysis of the cadets and post-graduate students' self-assessment in the context of developing research in their diploma works, PhD thesis and Doctoral dissertations. The respondents had to assess their analytical and critical thinking skills, according to 6 key descriptors of RFCDC (Council of Europe, 2017b). The respondents were to choose numbers from 1 to 10 assessing their personal traits from the list of 6 descriptors, indicating the lowest level as 1 and the highest level as 10 (Table 1). For the purpose of spreading the questionnaire among the respondents, we used either Google Forms or paper forms.

**Table 01.** Analytical and critical thinking skills of cadets and post-graduate students: self-assessment

The Key Descriptors	(-) Scores (+)
Can identify similarities and differences between new information and what is already known	1 2 3 4 5 6 7 8 9 10
Uses evidence to support his opinions	1 2 3 4 5 6 7 8 9 10
Can assess the risks associated with different options	1 2 3 4 5 6 7 8 9 10
Shows that he thinks about whether the information he uses is correct	1 2 3 4 5 6 7 8 9 10
Can identify any discrepancies or inconsistencies or divergences in materials being analysed	1 2 3 4 5 6 7 8 9 10
Can use explicit and specifiable criteria, principles or values to make judgments	1 2 3 4 5 6 7 8 9 10
	Total scores:
Self-assessment:	

The post-graduate students used the Internet to get Google Forms with the questionnaire. The cadets did not have access to the Internet at that time and had to work with paper forms.

## 6. Findings

What is there so important about analytical and critical thinking skills? First, we should say that analytical and critical thinking skills consist of a large amount of interrelated skills. Analytical thinking skills are those skills that are required to analyse texts, arguments, interpretations, issues, events, experiences, etc. in a systematic and logical manner. Second, critical thinking skills in their turn consist of those skills that are required to evaluate and make judgments about materials of any kind. As a rule, we

evaluate the outcomes of our thinking processes - the reasoning that we have arrived at the conclusion or the factors considered in making a decision.

The focus of our research of educational process at higher airborne command school is on the development and improvement of the cadets and post-graduate-students' skills that characterize clear, precise, purposeful thinking. There are countless examples of the need for critical thinking in the military professional environment: analysing actions of terrorism, assessing threat and preparing tactics, techniques and procedures. Multiple analytical and critical thinking skills are required to participate in peacekeeping operations and humanitarian missions.

### **6.1. Research question 1: Do cadets and post-graduate students realize the importance of analytical and critical thinking skills for their professional activity?**

The first research task was to analyse the set of data, which contained cadets and post-graduate students' opinions on the importance of developing analytical and critical thinking skills for their research work and future professional activity. The following data come from grouping the responses according to the answers of the cadets and post-graduate students.

Out of 58 respondents:

Practically all the respondents 96.5% (56 respondents) agreed that, "analytical and critical thinking skills help military men master the challenges of the environment and bring stability to a volatile world".

87.9% of the rated answers (51 respondents) were, "Analytical and critical thinking skills lead to more certainty and confidence in doing research".

82.7% of the rated answers (48 respondents) correlated analytical and critical thinking skills with professional culture considering "these skills help simplify complex problems and bring clarity to the ambiguous issues of the military environment".

91.3% of the rated answers (53 respondents) expressed assurance that "contemporary military operational environment demands officers who possess a keen sense of problem, analytical and critical thinking skills".

5.2% of the rated answers (3 respondents) assumed that "thinking is natural and you do it every day, you needn't work hard to develop it, it's easy".

### **6.2. Research question 2: What is cadets and post-graduate students' self-assessment of their analytical and critical thinking skills?**

We used the descriptors of Reference Framework for Competences of Democratic Culture in education setting of the airborne command school, as they provide operationalization of analytical and critical thinking skills in terms of the concrete patterns of behaviour that may be displayed by cadets and post-graduate students. We used the descriptors to support cadets and post-graduate students' self-assessment of current level of proficiency in order to identify areas of further development. The following criteria were identified as relevant for formulating the descriptors: brevity, positivity, clarity, independence and definiteness. The descriptors were scaled to different levels of proficiency - basic, intermediate and advanced. The outcome was that 6 descriptors were submitted to respondents from the military school. (Council of Europe, 2017b).

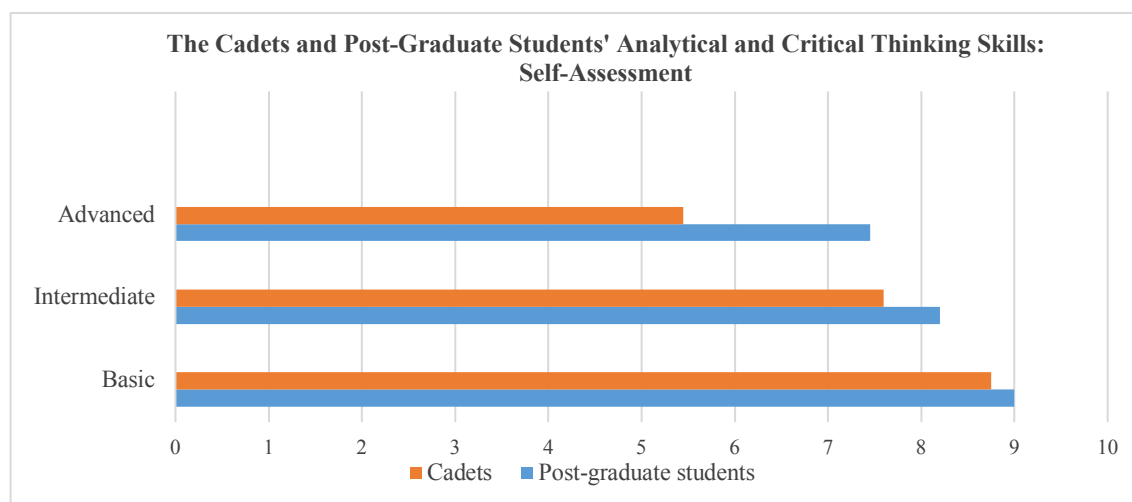
**Table 02.** The level of analytical and critical thinking skills of the cadets and post-graduate students according to their self-assessment

The level of the skills	The key descriptors	Max.	Cadets 36 respondents (an average score)	Post-graduate students 22 respondents (an average score)
Advanced	Can identify any discrepancies or inconsistencies or divergences in materials being analysed	10	5,6	7,2
	Can use evidence to support his opinions	10	5,3	7,7
Intermediate	Can assess the risks associated with different options	10	7,4	8,0
	Shows that he thinks about whether the information he/she uses is correct	10	7,8	8,4
Basic	Can identify similarities and differences between new information and what is already known	10	8,9	9,2
	Can use explicit and specifiable criteria, principles or values to make judgments	10	8,6	8,8

As we see from the table 02 the post-graduate students had higher critical thinking scores as compared to the cadets in their self-assessment of analytical and critical thinking skills. All the respondents worked separately and had their own individual score. For the sake of analysis, we use average scores of different descriptors of the questionnaire.

The first group consisted of 36 cadets of the 5<sup>th</sup> year of study, all being male. They had just finished writing their diploma papers. Their self-assessment was rather strict, because they had some difficulties in analysis and reasoning while doing their research. Their average scores are not very high.

The second group included adjuncts, PhD students and Doctoral students. Surprisingly, doctoral students gave their analytical and critical thinking skills the lowest scores in their group. It means that they see a clear perspective for their future development and they are ready for hard work. In general, the average score of post-graduate students is higher than that of the cadets.



**Figure 01.** An average score of the cadets and post-graduate students' analytical and critical thinking skills: self-assessment

The graphic chart (figure 01) demonstrates an average score of the two groups of respondents in comparison. At the basic level, the cadets showed an average score of 8.75, while post-graduate students had 9 as an average score. The intermediate level was demonstrated correspondingly by cadets with an average score of 7.6 and by post-graduate students – 8.2. At the advanced level, an average score was not very high. The cadets had only 5.45, and the post-graduate students admitted 7.45. In any case, we should say that it was a good level of analytical and critical skills. It means that our respondents realize that there is a room for their development in the future.

## 7. Conclusion

The analysis of the cognitive skills in the context of professional culture of the military specialists proves that the field of research is still in progress, with widespread understanding of the phenomenon. In the present research, analytical and critical thinking skills are considered as non-professional skills. Effective analytical thinking incorporates critical thinking while evaluating materials under analysis, effective critical thinking in its turn incorporates analytical thinking through drawing distinctions and making connections (Council of Europe, 2017a). That is why, analytical and critical thinking skills are inevitably linked together. The research also finds out the prevailing trends in perception of cadets and post-graduate students in the higher airborne command school: contemporary military environment shows demand for officers who possess a keen sense of problem, analytical and critical thinking skills. Finally, the research proves that the development of analytical and critical thinking skills is incorporated into the higher airborne school curriculum as the post-graduate students give higher assessment scores of their cognitive skills in comparison with the 5<sup>th</sup> year cadets. When future officers are actively engaged in analytical and critical thinking, they become effective decision-makers.

## References

- Almazova, N., Khalyapina, L., & Popova, N. (2016). International youth workshops as a way of preventing social conflicts in global developing world. *3rd International multidisciplinary scientific conference on social sciences and arts (SGEM-2016), Book 2, Vol. 1, 253-260.* <https://doi.org/10.5593/SGEMSOCIAL2016/HB21/S01.033>
- Avdeeva, T. I., Kulik, A. D., Kosareva, L. A., Zhilkina, T. A., & Belogurov, A. Y. (2017). Problems and prospects of higher education system development in modern society. *European Research Studies Journal, 20 (4B), 112-124.*
- Baryshnikov, N. V., & Korzhan, E. A. (2016). Innovatizaciya obrazovatel'nogo processa v voennom vuze [Innovatization of educational process in military higher education institution]. *Pedagogy, 10, 30-36.* [In Rus.]
- Bychenko, Y. G., & Balandina, T. M. (2019). O sovershenstvovanii professional'nogo obrazovaniya kursantov voennogo vuza [Improving the military vocational training of cadets at military institute]. *Higher Education in Russia, 28(4), 98-107.* [In Rus.]. <https://doi.org/10.31992/0869-3617-2019-28-4-98-107>
- Council of Europe (2017a). *Reference Framework of Competences for Democratic Culture (RFCDC)*. (Vol. 1. Context, concepts and model). Strasbourg: Council of Europe Publishing. Retrieved from <https://rm.coe.int/prems-008318-gbr-2508-reference-framework-of-competences-vol-1-8573-co/16807bc66c>.
- Council of Europe (2017b). *Reference Framework of Competences for Democratic Culture (RFCDC)*. (Vol. 2. Descriptors of competences for democratic culture). Strasbourg: Council of Europe

- Publishing. Retrieved from <https://rm.coe.int/prems-008418-gbr-2508-reference-framework-of-competences-vol-2-8573-co/16807bc66d>
- Dhami, M. K., & Careless, K. (2019). Intelligence analysts' strategies for solving analytic tasks. *Military Psychology, 31*(2), 117-127. <https://doi.org/10.1080/08995605.2018.1561105>
- Grigoras, R., & Mustata, A. (2016). The need for critical thinking in the military educational system. In: I. Roceanu (Ed.), *12th International Scientific Conference on eLearning and Software for Education (eLSE). Vol 2* (pp. 387-392). Bucharest, Romania: "Carol I" National Defence University Publishing House. <https://doi.org/10.12753/2066-026X-16-144>
- Guillot, W. M. (2006). Critical thinking for the military professional. *Military Intelligence Professional Bulletin, 32*(3), 36-45.
- Halpern, D. F. (2014). *Thought and Knowledge: An Introduction to Critical Thinking* (5th ed.). NY: Psychology Press. Retrieved from [https://tandfbis.s3.amazonaws.com/rtmedia/pdf/9781848726291/chpt\\_1.pdf](https://tandfbis.s3.amazonaws.com/rtmedia/pdf/9781848726291/chpt_1.pdf)
- Karlova, E. N. (2018). Dinamika cennostnyh orientacij i ustanovok kursantov voennyh obrazovatel'nyh organizacij [Dynamics of value orientations and attitudes of military education institutions' cadets]. *Higher Education in Russia, 27*(5), 152-159. [In Rus.].
- Kostin, K. K., Korchmin, S. A., & Salkova, D. V. (2018). Sistemnyj podhod k professional'nomu stanovleniyu oficerov v chastyah i podrazdeleniyah vozdushno-desantnyh vojsk [Systematic approach to professional development of officers in units and subunits of Airborne Troops]. *Military Thought, 11*, 77-90. [In Rus.].
- Paul, R., & Elder, L. (2013). *Critical Thinking*. United Kingdom: Pearson Education. Retrieved from: <http://biblioclub.ru/index.php?page=book&id=464894>.
- Roohr, K., Olivera-Aguilar, M., & Ling, G. (2019). A multi-level modelling approach to investigating students' critical thinking at higher education institutions. *Assessment & Evaluation in Higher Education, 44*(6), 946-960.
- Shevchenko, B. A., Bugrova, E. I., Cherniavskaya, E. S., & Kostikova, L. P. (2018). Developing Professional Culture of the Military: Linguistic, Communicative and Plurilingual Skills. *European Proceedings of Social and Behavioural Sciences, 51*, 191-197. <https://doi.org/10.15405/epsbs.2018.12.02.21>
- Voevoda, E. V., & Belogurov, A. Y. (2018). Aksiologiya obrazovaniya v diskurse sovremennoj politiki [Axiology of education in the discourse of contemporary policy]. *Polis-Politicheskiye Issledovaniya, 6*, 172-179. [In Rus.] <https://doi.org/10.17976/jpps/2018.06.12>.