SOME FEATURES OF THE ROLE OF THE OPERATIONS RESEARCH COURSE IN THE MILITARY EDUCATION SYSTEM

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This article explains, from an analytical perspective, the conceptual foundations and didactic features of the "Operations Research" course within the military education system, as well as its impact on the formation of decision-making competencies. The primary aim of the study is to demonstrate, through measurement criteria, the added value that tools of operations research such as mathematical modeling, probability theory, optimization, and simulation bring to officer training. In parallel, it presents a methodological framework for current issues including digital transformation, artificial intelligence support, multi-criteria decision making, risk management under uncertainty, and the integration of operational games into the curriculum. The research is based on a mixed-methods design. In the first component, a curriculum analysis is carried out and the course objectives and outcomes are mapped to Bloom's taxonomy. In the second component, the toolset constituting the core of the course is systematized. This includes linear and integer programming, dynamic programming, network planning, k-out-of-n reliability models, Markov processes, queueing theory, stochastic optimization, Monte Carlo simulation, and game theory. In the third component, applied scenarios are developed, for example multi-criteria logistic routing in the supply chain, resource allocation for Radiation-Chemical-Biological safety (CBRN), assessment of the resilience of communications networks, and modeling of incident response time at training ranges. In the fourth component, a measurement and evaluation system is established. Here a KPI matrix is applied across knowledge, skills, and attitudes, and triangulation is performed through project-based learning and periodic war-gaming laboratories.

The analysis shows that the Operations Research course is a critical instrument in shaping a three-tier competency structure. The first tier is mathematical-statistical literacy. At this stage, learners internalize the logic of dynamic decision making, sensitivity analysis, and the quantification of uncertainty. The second tier comprises modeling and simulation skills. Students build digital twins for logistics, combat service support, personnel planning, and equipment reliability based on real data, and compare decision outcomes through scenario analysis. The third tier is a decision-making culture aligned with doctrine and ethics. At this level, moral-legal constraints, minimization of civilian harm, fair allocation of resources, and requirements for transparent justification are taken into account. It is also emphasized

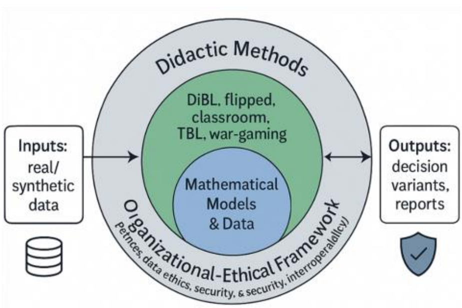

Fig. 1. Three-layer conceptual model of the "Operations research" course

that artificial intelligence algorithms are didactically positioned as decision-support tools rather than decision makers. The findings confirm the interdisciplinary nature of the course and its bridge function for transitioning to operational-tactical planning.

The article models operations research not only as a set of technical tools but also as a didactic-ethical framework. In the proposed conceptual model, the course is presented with a three-layer construct. The core layer comprises mathematical models and data management. The middle layer consists of didactic methods, including problem-based learning, the flipped classroom, team-based projects, and red-blue games. The outer layer covers organizational policies, data governance protocols, security requirements, and inter-disciplinary coordination mechanisms. This structure enables the proposed KPI matrix to be mapped to curriculum outcomes and creates a continuous improvement cycle. Applied examples show that systematic instruction in the course accelerates operational and tactical decision processes, reduces resource waste, and ensures stable performance under uncertainty. In logistics routing, multi-criteria optimization yields savings in distance and time, while reliability modeling of the equipment fleet enables rational scheduling of preventive maintenance. Simulation of CBRN risk scenarios makes it possible to measure incident response times and compare alternative mitigation measures. When laboratory exercises of the course are synchronized with training cycles of HQ personnel, the justification of decisions is strengthened and a culture of accountability in reporting takes shape. Key limitations include restricted access to real operational data, the sensitivity of simulation results to scenario assumptions, and the need to ensure algorithmic transparency. These risks are mitigated through methodological approaches such as synthetic data generation, model verification procedures, cross-calibration, and independent evaluation mechanisms. Strengthening the ethics-legal module in the curriculum consolidates a culture of accountability when using artificial intelligence.

A spiral approach is advisable in curriculum design. In the first stage come mathematical foundations and probability-statistics, in the second stage optimization and network models, and in the third stage simulation, game theory, and decision-support systems. At each stage, real-scenario mini-projects, data ethics seminars, and war-gaming laboratories should be included. At the academic-organizational level, standardization of data infrastructure, open interfaces, model versioning, and reproducibility protocols are essential. For the teaching staff, methodological training should include development modules on didactic design, experimental evaluation, and mathematical programming. As a result of systematic implementation, measurable improvements are achieved in decision-making quality, efficient allocation of training resources, agile planning capabilities, and predictability in managing operational risks. This effect strengthens a science-based decision-making culture in the military education system, increases resilience in critical functions such as communications and logistics, and accelerates the plan-do-check-act cycle at the strategic level. The article shows that the Operations Research course functions as a strategic bridge in the military education system that unites theoretical knowledge with practical decision mechanisms. When modern mathematical-computational tools are synthesized with an ethics-legal framework and didactic design, the course systematically shapes officers' analytical thinking, risk awareness, and accountable decision-making skills. The proposed model and KPI matrix provide a practical methodological basis for the planning, delivery, and continuous improvement of the course. Future research can be expanded by evaluating anonymized sharing of operational data, explainable models of artificial intelligence, and the integration of operational games with hybrid simulation platforms

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