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FOSTERING INTUITIVE COMPETENCE IN CADETS THROUGH MATHEMATICAL THINKING AND CREATIVITY

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Abstract
This article explores the development of intuitive competence in cadets by enhancing mathematical thinking and promoting a creative approach in the educational process. The interrelation between intuition and mathematical thinking is analyzed, highlighting the role of creative thinking in intuitive decision-making. Methods for developing mathematical thinking and fostering creativity among cadets are presented, along with practical pedagogical examples illustrating how solving mathematical problems can cultivate intuitive thinking skills. The article concludes with recommendations for effective teaching practices.

Keywords: Intuition, intuitive competence, mathematical thinking, creativity, creative approach, pedagogical methods, cadets.

Introduction

In the modern educational landscape, preparing innovative and creative professionals is recognized as a priority. For cadets, developing the capacity for independent thought and the ability to make rapid, correct decisions in uncertain situations is a vital pedagogical goal. Intuitive competence refers to an individual's ability to quickly and accurately make intuitive decisions in specific situations, drawing on their accumulated knowledge and experience. Research shows that intuitive competence is a crucial aspect of human activity and plays an important role in generating new knowledge and innovations. According to the psychologist D. Kahneman, intuitive thinking (“System 1”) is rapid and automatic, occurring without conscious analysis. In scientific and creative processes, “inspirational

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intuition" is slower and relies on deeper thought and "gut feeling"—this could be considered a "System 3" process. In this sense, intuitive competence is not only about quick decision-making in routine situations but also about finding creative solutions that lead to innovation.

For cadets, such competence is particularly relevant in military-academic education, where they will later face situations requiring rapid and correct decisions, often under uncertainty or with incomplete information. Developing intuitive decision-making skills therefore requires both solid logical preparation and a creative approach. Researchers suggest that integrating mathematical thinking and creativity enables individuals to develop comprehensive, balanced thinking skills for a variety of situations. This article analyzes the role of mathematical thinking and **creativity** in the development of intuitive competence, and outlines teaching methods that support this development.

Mathematical thinking and intuitive reasoning

Teaching mathematics serves to sharpen intellectual abilities and boost overall cognitive potential. In particular, the development of logical mathematical thinking is closely linked to the growth of intuition. Numerous scholars (J. Hadamard, K. Duncker, Yu.M. Kolyagin, N. Mayer, A.I. Markushevich, D.D. Mordukhai-Boltovskii, A. Poincaré, V. Hacker, A.Ya. Khintchine, T. Ziehen, S.I. Schwarzburd, and others) have noted the significance of intuition in mathematics education. French mathematician Henri Poincaré wrote: "The chief aim of mathematical teaching is to develop all aspects of the mind, and among these intuition is by no means the least important". Russian scholar V.A. Steklov also argued, "There is only one method for discovery and invention - intuition, because nobody has ever discovered anything solely through logic". These views highlight the close relationship between mathematical and intuitive thinking.

Indeed, when solving mathematical problems, an intuitive hypothesis or "gut feeling" often emerges first, followed by logical justification. Studies of great mathematicians' creative processes show that mathematical discovery typically blends logical analysis with moments of intuitive "insight". British mathematician Ian Stewart described intuition as follows: "I can't precisely explain what I mean by intuition. What is clear is that intuition is the lifeblood of the true mathematician (or physicist, engineer, poet). Intuition lets the mathematician 'sense' the subject - he or she can feel a theorem is true before having a formal

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proof, and will later discover the proof". Thus, intuitive thinking is an inseparable part of mathematical reasoning, allowing individuals to sense the correctness of a solution with inner confidence.

Developing mathematical thinking enables cadets to comprehend and solve complex problems. Importantly, there is a need to integrate analytic (associated with left - brain activity) and synthetic - creative (associated with right - brain activity) thinking in mathematics education. This broader, creative approach helps learners see the whole picture, distinguish relevant from irrelevant information, and recognize multiple solutions - key aspects of intuitive reasoning. The formation of mathematical intuition is largely determined by teaching methods and requires the use of targeted strategies. According to researchers, abilities such as navigating new, unfamiliar problem situations, predicting likely outcomes, selecting a path to a solution, and identifying errors are hallmarks of productive intuition. To cultivate such skills, it is recommended to provide learners with both practical (word - based) and theoretical problems that encourage hypothesis formation and intuitive estimation before working out a solution.

Creative approaches in the learning process

Creativity plays an exceptional role in developing intuitive competence. Creativity is defined as the drive to generate new ideas and the ability to find unconventional solutions. Pedagogical research demonstrates that increasing the use of creative approaches in mathematics education strengthens overall student competence. In particular, the processes of constructing and solving mathematical problems foster independent thinking, flexibility of ideas, and the discovery of new approaches - key creative attributes.

To encourage creative thinking, teachers should employ a creative approach in class. This goes beyond providing ready-made knowledge and formulas - instead, it involves prompting students to independently discover principles, pose open-ended questions, and tackle unusual problems. For example, when introducing a new topic, students can be given real-world examples and invited to formulate and explore the underlying problem themselves. This discovery-based approach leads students to "uncover" an abstract concept and then collaboratively construct its formal definition—an activity that stimulates both reasoning and creativity.

Using problem-posing and problem-solving as teaching methods is recognized as an effective way to cultivate creative thinking. Research indicates that allowing

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students not only to solve but also to construct their own problems significantly boosts their creative and intuitive reasoning. When a student devises a problem, they develop a deeper understanding, envision alternative solutions, and generate original ideas. Open-ended problems (with multiple solutions), contextual real-life tasks, and group creative projects also foster creative thinking skills. Such tasks give every student a voice, enable the sharing of ideas, and - through collaborative discussion - develop both creative and critical thinking.

Importantly, intuition is accelerated in creative environments. When engaging in creative activity, students generate several possible solutions, compare them, and, through gut feeling, select the most appropriate before logically justifying their choice. Such exercises build a store of intuitive decision-making experience. Thus, by incorporating creative approaches, instructors simultaneously nurture both creative and intuitive thinking in cadets.

Methods for developing intuitive competence

Successfully fostering intuitive competence in cadets requires a structured and purposeful learning process, with a focus on developing mathematical reasoning and incorporating creative-practical exercises. Key methods include:

- **Gradual problem escalation:** Start with simple, familiar problems and gradually introduce more ambiguous, complex tasks. This trains cadets in problem analysis and intuitive hypothesis formation. For example, before calculating an exact answer, cadets are asked to estimate the outcome - this builds the skill of making an initial intuitive judgment, then verifying it through calculation.
- **"What if…?" approach:** Cadets are prompted to alter problem parameters and consider alternative scenarios. For example, how would a change in a condition affect the solution? In answering, cadets consider multiple possibilities and practice predictive intuition.
- **Situational (scenario-based) exercises:** Placing cadets in simulated professional contexts requiring decision-making under pressure effectively builds intuitive competence. For instance, military education might involve tactical scenarios where cadets must quickly make decisions based on their training and experience—often relying on an "inner sense." Research shows that such experience in stressful situations helps military personnel make more reliable intuitive decisions in real-life situations.

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- **Deliberate intuition training:** Special exercises require cadets to make decisions within a limited time (a few seconds), increasing reliance on intuition. Afterward, decisions are analyzed and discussed, helping cadets develop the ability to **reflect on their intuition** and adjust their approach if necessary. Over time, intuition becomes a more regulated, conscious skill.
- **Creative projects and games:** Strategy games and project work also support the development of intuitive competence. For example, in a team strategy game, participants must coordinate rapid decisions, anticipate several moves ahead, and adjust their actions accordingly—thus developing anticipatory intuition.

These methods, when implemented, help cadets build intuitive competence. The teacher's role is crucial - creating an environment where cadets can express their thoughts freely, take intellectual risks, and feel their intuitive contributions are valued. Intuition and creativity thrive in open, supportive environments where even unexpected ideas are explored and justified.

Research also shows that intuition is closely linked with other personal competencies. Intuition is a core element of emotional intelligence, supporting the ability to manage one's feelings, empathize with others, and engage in creative thought. People who rely on intuition in problem-solving can see situations holistically, take rational risks, propose more original and meaningful ideas, and avoid excessive stress and doubt. Thus, developing intuitive competence in cadets enhances not only professional readiness but also broader personal and social competencies.

Conclusion

In summary, developing intuitive competence in cadets is essential for their future professional and personal success. Intuition is an internal mechanism that enables rapid, correct decision-making in complex and uncertain situations. Its development is inextricably linked to both mathematical reasoning and creative imagination. Mathematical thinking fosters logical, evidence-based analysis, while creativity encourages the search for unconventional solutions - together, they elevate intuitive thinking.

The theoretical and practical observations in this article demonstrate that combining analytical and intuitive approaches, engaging with mathematical problems, creative tasks, and situational exercises, cadets' intuition can be consciously developed. The instructor's use of innovative methods and support

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for every cadet's creative-intuitive exploration are crucial. Cadets with developed intuitive competence become independent and rapid thinkers capable of non-standard solutions - not only in mathematics but in all spheres of life.

Modern pedagogical research and best practices confirm that education that unites "intellectual effort" with "gut feeling" is the most effective. Fostering mathematical thinking and creativity leads to intuitive competence, which is a key to success in professional activity. Thus, uniting logic and intuition, theory and practice, prepares a new generation of well-rounded specialists.

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