

Impact of Psychophysiological Factors on Academic Performance and Adaptation of First-Year University Students

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Annotation: This study examines how psychophysiological factors influence academic performance and adaptation in first-year university students. Visual memory, attention, and visuomotor reaction speed were assessed at three stages of the 2024–2025 academic year: beginning, pre-examination, and post-examination. Results indicated that students' memory and attention generally improved throughout the year, while visuomotor reaction speed temporarily declined after exams. Female students demonstrated slightly better cognitive performance than males. These findings suggest that psychophysiological indicators play a critical role in facilitating adaptation to the educational process and improving learning efficiency.

Keywords: cognitive functions, learning adaptation, visuomotor reaction, visual memory, attention, academic performance, first-year students.

Introduction The educational process in higher education is a period of rapid intellectual, psychological, and physical development. Cognitive functions such as memory, attention, and visuomotor reactions are particularly sensitive during this period. First-year students must adapt to new learning conditions, which imposes specific demands on their mental and nervous system functioning. Recent technological and social influences, including mobile phones, social networks, and online learning resources, have also significantly impacted students' cognitive functioning.

Materials and Methods Participants: 38 first-year biology students at Karshi State University (28 female, 10 male; average age 19.7 years)

- Stages: beginning of the academic year (Stage 1), pre-exam (Stage 2), post-exam (Stage 3)
- Measures: Visual imagery memory (VIM), Digital visual memory (DVM), Attention (Schulte-Gorbov table), Visuomotor reaction (VMR)
- Procedure: Psychotest device used to assess all cognitive parameters in the morning (8:30–12:30)
- Data analysis: Microsoft Excel

Results:

Memory improved in both genders throughout the academic year.

- Attention increased in females, slightly fluctuated in males.
- Visuomotor reaction improved during the learning process but declined after exams.
- Girls generally outperformed boys in most cognitive indicators.

Discussion: Cognitive improvements are linked to engagement with coursework and timely completion of assignments.

- Exam periods influence attention and visuomotor reaction temporarily.
- Individual factors (lifestyle, family, nervous system type) influence adaptation.
- Adaptation to academic stress triggers nervous system responses observable in cognitive indicators.

Conclusion:

Cognitive indicators change dynamically throughout the academic year in line with academic demands.

- These changes facilitate students' adaptation to the educational process and help prevent academic burnout.
- Future research should expand sample size and consider additional influencing factors.

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