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СОДЕРЖАНИЕ

ФИЗИКА

- Ho Quynh Anh** 10
FABRICATION AND PROPERTIES OF Cu_2O MATERIAL

БИОЛОГИЯ

- Chu Thi Hong Hanh** 15
STRATEGIES FOR COGNITIVE OPTIMIZATION: THE MULTIDIMENSIONAL CORRELATION BETWEEN PHYSICAL ACTIVITY, CONCENTRATION CONTROL, AND ACADEMIC PERFORMANCE IN UNIVERSITY STUDENTS

ТЕХНИКА И ТЕХНОЛОГИЯ

- Hojakova G., Yazgulyyeva A., Annanurova G.** 19
THE ROLE OF ECONOMICS IN THE TELECOMMUNICATIONS INDUSTRY: THE FOUNDATION OF DEVELOPMENT AND TRANSFORMATION

- Jumabayeva J., Soyunova O., Babayeva A., Achylova O.** 21
THE ROLE OF CYBERSECURITY IN THE COMMUNICATIONS SYSTEM: ENSURING RESILIENCE IN A HYPER-CONNECTED WORLD

- Rahymova A., Garryev A., Guljanov S., Akmyradova A.** 24
THE CONVERGENCE OF QUANTUM COMPUTING AND ARTIFICIAL INTELLIGENCE: A NEW PARADIGM IN COMPUTATIONAL SCIENCE

- Гурбанов Б., Атаманова Ш., Коменкова Г., Мередов М.** 26
КОНСТРУКЦИЯ И ЭКСПЛУАТАЦИОННЫЕ ХАРАКТЕРИСТИКИ ТРЕХФАЗНЫХ АСИНХРОННЫХ ДВИГАТЕЛЕЙ С КОРОТКОЗАМКНУТЫМ РОТОРОМ

- Ханджанов О.Я.** 28
МОДЕРНИЗИРОВАННАЯ СТРУКТУРА МЕХАНИЗМА УПРАВЛЕНИЯ ИННОВАЦИОННОЙ ДЕЯТЕЛЬНОСТЬЮ НЕФТЕГАЗОВОЙ КОРПОРАЦИИ

СЕЛЬСКОЕ ХОЗЯЙСТВО

- Сейтиев А.С., Готурова Э.Б.** 32
СОВРЕМЕННЫЕ МАШИНЫ И ТЕХНОЛОГИИ СЕЛЬСКОМ ХОЗЯЙСТВЕ

ИСТОРИЯ

- Сергеева К.А.** 36
ТРАНСФОРМАЦИЯ СОЦИАЛЬНОЙ СТРУКТУРЫ РОССИЙСКОГО ОБЩЕСТВА В КОНЦЕ XX – НАЧАЛЕ XXI ВЕКА

ЭКОНОМИКА И УПРАВЛЕНИЕ

- Акмурадова Г., Агаджанов А., Нурлыева Н.** 41
ИСПОЛЬЗОВАНИЕ И ЗНАЧЕНИЕ НЕМЕЦКОГО ЯЗЫКА В МИРЕ

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STRATEGIES FOR COGNITIVE OPTIMIZATION: THE MULTIDIMENSIONAL CORRELATION BETWEEN PHYSICAL ACTIVITY, CONCENTRATION CONTROL, AND ACADEMIC PERFORMANCE IN UNIVERSITY STUDENTS

Abstract

In the context of increasing academic pressure, this study investigates the impact of Physical Education (PE) on the cognitive and academic variables of university students. By employing a comparative experimental method between a group participating in regular exercise (≥ 3 sessions/week) and a sedentary group (< 1 session/week), the research collected data on concentration levels and Grade Point Average (GPA) over a 12-week period. Statistical analysis using t-tests revealed that the active group showed a significant breakthrough in concentration scores (increasing by 18.5%) and GPA (increasing by 9.4%) compared to the control group. Pearson correlation coefficients confirm the foundational role of physical health in driving intellectual efficiency.

Keywords:

cognitive optimization, regular exercise, GPA, concentration ability, physical education.

I. INTRODUCTION AND THEORETICAL FRAMEWORK

1.1. Research Context

In the modern educational landscape, university students face not only a massive volume of knowledge but also intense pressure from exams and high academic requirements. One of the most critical factors influencing learning efficiency is the ability to concentrate, which serves as the foundation for absorbing and processing information. In Vietnam, the evaluation of PE's impact on academic success has yet to be deeply researched.

1.2. The Link Between Exercise and the Brain

Physical activity is not merely a supplementary activity for physical health but also brings numerous mental and cognitive benefits¹¹. International studies have indicated that physical activities help improve cognitive function, reduce stress, and enhance concentration, thereby raising academic performance¹². Movement stimulates the production of neurotransmitters like dopamine and serotonin, which facilitate logical thinking and memory.

II. DETAILED RESEARCH METHODOLOGY

2.1. Subjects and Grouping

The study was conducted on a sample of $N = 100$ university students recruited from various disciplines within the same institution¹⁴:

- **PE Group (Experimental):** Consists of 50 students participating in a regular PE program at least 3 sessions per week throughout the semester.
- **Non-PE Group (Control):** Consists of 50 students who did not participate in regular PE or participated very little (less than 1 session per week).

2.2. Measurement Tools and Procedures

To ensure objectivity, the study utilized a dual measurement system:

1. **Concentration Test:** A standardized test (measured on a 0-100 scale) designed to evaluate attention span through timed calculation or multiple-choice exercises.