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SPACE ANALYSIS AS A TOOL FOR STRATEGIC DEVELOPMENT IN HIGHER EDUCATION INSTITUTIONS

This research provides a comprehensive analysis of strategic recommendations for higher education institutions (HEIs) in response to contemporary challenges and opportunities in the educational landscape. It emphasizes the importance of ensuring financial stability through cost optimization and diversification of funding sources, while enhancing education quality by investing in faculty development and modernizing programs to align with labor market needs. The study also highlights the necessity of infrastructure support, focusing on technical modernization and the adoption of digital technologies to increase accessibility.

In addition, the research outlines strategies for enhancing the reputation and brand of HEIs through effective communication, alumni engagement, and compliance with accreditation standards. Aggressive strategies are proposed for innovation in educational programs, international market expansion, and active participation in research activities to foster growth and competitiveness.

Keywords: SPACE-analysis; higher education institutions (HEIs); infrastructure of education; financial stability; quality of education.

In the process of developing a roadmap for the advancement of Ukraine's educational sector, we conducted a SPACE analysis to determine the strategic position and assess potential directions for anti-crisis measures. This approach provided a comprehensive understanding of the current state of the education system, allowing us to identify both its strengths and weaknesses, as well as the opportunities and threats facing the sector. The evaluation of internal strengths and weaknesses highlighted key aspects such as the high qualification level of scientific and pedagogical staff, alongside shortcomings in the integration of modern technologies [1]. These insights enable targeted efforts to strengthen existing advantages while addressing identified vulnerabilities, ultimately contributing to the strategic resilience of the educational system.

The analysis of the external environment revealed potential opportunities, such as the expansion of international cooperation, as well as threats like cybersecurity issues and data protection challenges. This assessment facilitated the development of strategies that maximize opportunities while minimizing risks. By evaluating factors such as strategic aggressiveness, competitiveness, industry strength, and environmental stability, we were able to identify the most effective strategic directions to achieve the goals of educational development [2].

Conducting a SPACE analysis provided crucial information for creating the development roadmap, enabling the establishment of realistic goals and defining effective pathways to achieve them. This enhanced the efficiency of crisis management in the educational sector by clearly identifying priorities and resources necessary for the implementation of strategic initiatives [3]. Consequently, the SPACE analysis became a vital step in preparing the roadmap, offering deep insights into both internal and external factors influencing the education sector and helping shape strategies for sustainable development and enhanced competitiveness.

SPACE analysis (Strategic Position and Action Evaluation) is a methodology used to determine an organization's strategic position and develop appropriate strategic recommendations.

The SPACE analysis is based on the evaluation of four key factors: Financial Strength (FS), Competitive Advantage (CA), Industry Attractiveness (IA), and Environmental Stability (ES). Each of these factors is assessed using specific criteria, and the strategic position of the organization is determined based on this evaluation.

- Financial Strength (FS): This factor assesses the financial stability and capacity of the organization, including indicators such as revenue growth, profitability, and financial resources available for strategic initiatives.
- Competitive Advantage (CA): This evaluates the organization's competitive positioning in the market, considering aspects like market share, product differentiation, and operational efficiency.
- Industry Attractiveness (IA): This reflects the overall appeal of the sector in which the organization operates, measured by factors such as market growth potential, technological advancements, and regulatory environment.
- Environmental Stability (ES): This factor gauges the external conditions influencing the industry, including economic fluctuations, political stability, and technological disruptions.



By systematically assessing each of these factors, the SPACE analysis determines the most suitable strategic direction for the organization, whether it should pursue aggressive growth, cautious stability, or defensive strategies aimed at crisis mitigation and long-term sustainability [4].

We selected the National University of Water and Environmental Engineering (NUWEE) as a model for conducting the SPACE analysis due to its strategic significance in the region and its considerable potential for development in the context of informational externalities. The university possesses a robust scientific foundation and is actively engaged in research related to water management and environmental engineering, making it unique within Ukraine's educational sector. Moreover, NUWEE maintains an extensive network of external connections and partnerships, which creates favorable conditions for the implementation of innovative strategies and enhances its competitiveness.

This strategic position, combined with the university's expertise and collaborations, provides a strong basis for applying the SPACE analysis to assess its current standing and future growth opportunities. By examining NUWEE through the lens of financial strength, competitive advantage, industry attractiveness, and environmental stability, we aim to develop a comprehensive understanding of how it can further capitalize on its strengths while addressing any vulnerabilities, ultimately contributing to the development of the educational sector in Ukraine.

SPACE Analysis of NUWEE

The SPACE analysis for the National University of Water and Environmental Engineering (NUWEE) was conducted following a structured sequence:

1. Financial Strength (FS)

- Funding per Student: Measured by the amount of funding allocated per student. Rating: 2.7 out of 5.
- Funding per Scientific and Technical Staff Member: Measured by the funding amount per scientific and technical staff member (STSM). Rating: 3.2 out of 5.
- Revenue to Special Fund per Academic Staff Member: Measured by the revenue to the special fund per academic staff member (ASM). Rating: 1.1 out of 5.
- Current Liquidity Ratio: Measured by the ratio of current assets to current liabilities. Rating: 5 out of 5.

- Overall Performance Indicator: Assesses the overall effectiveness of the institution's activities. Rating: 4.8 out of 5.
 - Ratio of Special Fund Revenue to Total Funding: Measured by the ratio of special fund revenue to total funding. Rating: 0.4 out of 5.
- Overall Financial Strength Rating: 2.9 out of 5.*

2. Competitive Advantage (CA)

- Integral Attractiveness Coefficient of the Educational Institution: Rating: 2.6 out of 5.
 - Integral Efficiency Coefficient of the Scientific and Pedagogical Staff: Rating: 2.8 out of 5.
 - Integral Coefficient of Innovative and Scientific Development: Rating: 1.4 out of 5.
 - Integral Educational Activity Coefficient: Rating: 2.5 out of 5.
 - Integral Branding Coefficient of the Educational Institution: Rating: 2.1 out of 5.
 - Integral Coefficient of External Connections of the Educational Institution: Rating: 2.6 out of 5.
- Overall Competitiveness Rating: 2.3 out of 5.*

3. Industry Attractiveness (IA)

- Demand for Education: Assessed based on the growth trends in the number of applicants and students. Rating: 4.4 out of 5.
 - Economic Stability: Evaluation of the country's economic stability and its impact on education funding. Rating: 2.4 out of 5.
 - Technological Progress: Assessment of the availability of modern technologies and innovations in the educational process. Rating: 3.8 out of 5.
 - Social and Demographic Factors: Evaluation of social and demographic changes. Rating: 3.8 out of 5.
 - Regulatory Environment: Assessment of legislative changes regulating higher education institutions. Rating: 0.6 out of 5.
 - Level of International Cooperation: Evaluation of international exchange programs for students and faculty. Rating: 3.7 out of 5.
- Overall Industry Attractiveness Rating: 3.0 out of 5.*

4. Environmental Stability (ES)

- Financial Stability: Evaluation of long-term trends in funding from public and private sources. Rating: 6.1 out of 10.
- Market Risks: Assessment of the sector's vulnerability to changes in the economic environment. Rating: 7.4 out of 10.
- Equity of Access to Educational Services: Evaluation of access to quality education in various regions of the country. Rating: 4.0 out of 10.



- Level of Development of Innovative Educational Methods: Assessment of the implementation of new technologies and teaching methods. Rating: 4.0 out of 10.
- Emergence of New Educational Institutions: Evaluation of the opening of new universities, colleges, and other educational establishments. Rating: 3.0 out of 10.
- Aggressiveness of Competitors' Marketing Strategies: Assessment of the intensity of competition for students among educational institutions. Rating: 2.0 out of 10.

Overall Environmental Stability Rating: 2.6 out of 5.

Based on the obtained evaluations, the strategic position coordinates for the NUWEE were calculated and are presented on the SPACE graph:

- X-coordinate: -0.3
- Y-coordinate: -0.1

These coordinates indicate the strategic position of the institution in the context of financial strength and competitiveness. The negative values for both coordinates suggest the presence of certain challenges and threats that require attention.

The SPACE graph (see Figure) illustrates how these coordinates assist in selecting appropriate strategies for the university's development. Specifically, given the identified strategic position, the institution should focus on strengthening its financial stability and enhancing competitiveness through the development of innovative programs, improving educational processes, and reinforcing external partnerships.

Utilizing the SPACE analysis method to identify the strategic positions of NUWEE is a crucial step in formulating comprehensive strategies to address challenges and leverage development potential within the current educational environment.

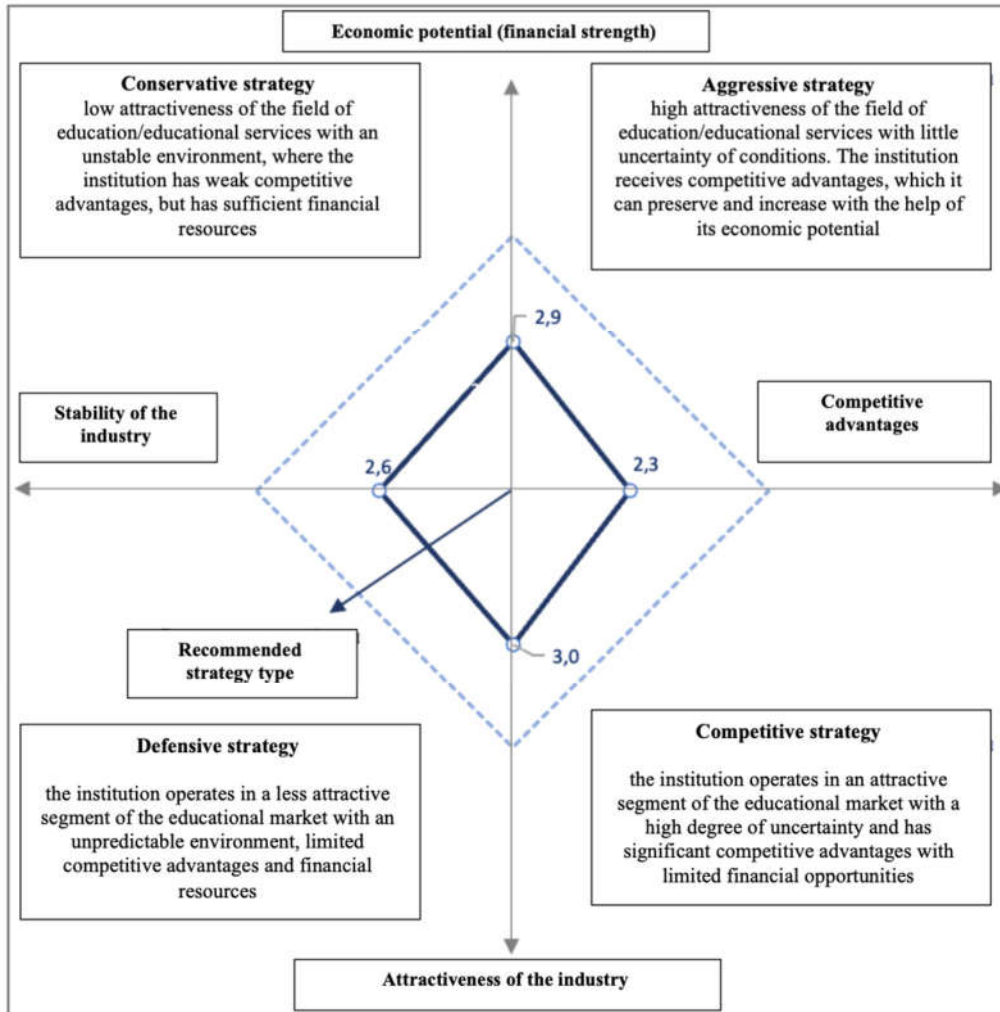


Figure. The use of the SPACE analysis method to identify the strategic positions of the studied HEI

Strategic Recommendations for Formulating *Conservative Strategies* for HEIs:

1. Ensuring Financial Stability: Institutions should focus on cost optimization by conducting a detailed analysis of expenses to reduce costs without compromising educational quality. Additionally, they can diversify funding sources by attracting additional financial resources through grants, partnerships with businesses, and charitable foundations.
2. Enhancing Educational Quality: To achieve academic excellence, institutions should invest in the professional development of faculty, enhance research facilities, and modernize educational programs in alignment with current labor market requirements. Implementing a robust quality monitoring system will also help identify and rectify deficiencies, ensuring a high standard of



educational delivery.

3. **Infrastructure Support and Development:** Institutions need to prioritize technical modernization by maintaining and upgrading classrooms, laboratories, and equipment to meet contemporary standards. Furthermore, investments in digital technologies will enhance access to online resources, e-libraries, and learning platforms, promoting flexibility and accessibility in education.
4. **Reputation and Brand Strengthening:** Developing an effective communication and marketing strategy is essential for increasing brand recognition. This includes participating in international rankings, collaborating with media outlets, and maintaining an active presence on social media. Engaging alumni networks can also bolster the institution's reputation through their professional achievements and support.
5. **Regulatory Compliance and Adaptability:** Institutions must ensure compliance with national and international accreditation standards. Developing mechanisms for rapid response to changes in legislation and labor market demands will help institutions remain competitive and relevant.

Strategic Recommendations for Formulating *Aggressive Strategies* for HEIs:

1. **Innovation and Development of New Educational Programs:** Creating unique educational programs that align with contemporary labor market needs and innovative trends is critical. The active implementation of cutting-edge technologies in the educational process, such as artificial intelligence and virtual/augmented reality, will enhance learning effectiveness and student engagement.
2. **Expansion into International Markets:** Attracting international students is key to growth, requiring the expansion of international exchange programs and the creation of appealing learning and living conditions. Establishing partnerships with leading foreign universities and research institutions facilitates experience exchange and elevates the HEI's academic standing.
3. **Aggressive Marketing and Branding:** Implementing aggressive marketing strategies will enhance brand visibility, including a strong presence on social media and participation in international educational exhibitions. Enhancing the institution's reputation through research publications in prestigious journals and

participation in international rankings is essential for maintaining high educational quality standards.

4. **Infrastructure Expansion:** Active investment in the development and modernization of educational and research facilities is crucial to meet modern requirements. Constructing new campuses, laboratories, and student dormitories will foster student enrollment growth.
5. **Active Participation in Research Activities:** Seeking national and international grants to support research activities will expand capabilities and elevate the quality of scientific research. Establishing new research centers focusing on advanced science and technology fields relevant to current market demands is vital for fostering innovation.

Strategic Recommendations for Formulating *Defensive Strategies* for HEIs:

1. **Supporting Financial Stability:** Regularly conducting financial risk analyses and implementing measures to mitigate them, such as creating reserve funds, ensures stability. Strengthening control over budget expenditures is necessary to avoid unnecessary costs and ensure effective resource utilization.
2. **Development and Retention of Human Resources:** Implementing professional development programs for faculty will help retain qualified personnel. Creating competitive working conditions and motivation systems is essential for attracting and retaining highly qualified specialists.
3. **Supporting Stability in the Educational Process:** Developing flexible educational programs that can quickly adapt to economic and social changes will ensure resilience. Expanding remote learning capabilities is crucial for maintaining continuity in the educational process during unforeseen situations.
4. **Strengthening Interaction with Partners and Stakeholders:** Enhancing collaboration with other educational institutions, businesses, government, and civil organizations will strengthen partnerships. Actively involving stakeholders in decision-making processes will ensure their interests are considered and secure their support.
5. **Ensuring Regulatory Compliance:** Continuously monitoring legislative changes and promptly adjusting the institution's activities to ensure compliance is necessary. Adhering to national and international quality standards in education enhances the institution's reputation and maintains stable student enrollment.



Strategic Recommendations for Formulating *Competitive Strategies* for HEIs:

1. **Enhancing the Quality of Educational Services:** Regularly updating and modernizing educational programs according to new knowledge, technologies, and labor market needs is essential. Investing in faculty professional development through training, conferences, seminars, and exchange programs will enhance teaching quality.
2. **Marketing and Branding:** Implementing effective marketing strategies will enhance brand visibility. Maintaining and strengthening the institution's reputation through research publications in prestigious journals and adherence to high-quality standards is crucial for competitiveness.
3. **International Cooperation:** Developing strategic partnerships with leading foreign universities for joint educational and research programs, as well as student and faculty exchanges, will enhance global presence. Creating attractive conditions for international students, including English-language programs and cultural support, is also important.
4. **Innovation and Research:** Investing in research activities and developing research infrastructure is vital for fostering innovation and scientific progress. Establishing incubators for startups and promoting innovative projects among students and faculty will further enhance competitiveness.
5. **Management and Organizational Culture:** Implementing modern management methods that ensure flexibility and prompt decision-making is critical. Fostering a positive organizational culture encourages employee development, engagement, and motivation, ensuring open communication and support for innovation.
6. **Enhancing the Student Experience:** Improving educational facilities to create modern laboratories, libraries, and resources is essential for providing a comfortable learning and research environment. Developing extracurricular programs and activities promotes personal development, social integration, and leadership skills among students.

Conclusions. This research explored the strategic positioning and management of higher educational institutions (HEIs) amidst ongoing challenges and transformations in the educational landscape. By applying SPACE analysis, we established key strategic coordinates that

inform the development of tailored strategies aimed at enhancing institutional performance and sustainability.

The assessment of strategic positioning revealed the significance of understanding an institution's place within the educational sector. With the X-coordinate set at (-0.3) and the Y-coordinate at (-0.1), we gained insights into the institution's competitive edge and responsiveness to external pressures. This positioning serves as a foundational reference for crafting effective strategies that align with both market demands and institutional capabilities.

The research also highlighted the importance of developing comprehensive strategic frameworks. By categorizing strategies into conservative, aggressive, defensive, and competitive approaches, we addressed critical aspects of institutional management, including financial stability, quality of education, infrastructure development, market positioning, and regulatory compliance. This multifaceted approach enables institutions to respond effectively to both opportunities and threats in their operational environments.

A key finding of the study is the paramount importance of maintaining high educational standards and fostering innovation. Institutions must continuously invest in faculty development, curriculum modernization, and technological integration to enhance the learning experience and remain competitive in the global marketplace. By prioritizing academic excellence and adaptability, HEIs can better prepare graduates for the evolving demands of the workforce.

Financial sustainability emerged as another critical area of focus. The research pointed to the necessity for HEIs to ensure financial stability through prudent fiscal management and diversification of funding sources. Strategies such as optimizing operational costs, seeking grants, and forming partnerships with industry stakeholders can mitigate financial risks and enhance institutional resilience against economic uncertainties.

Engaging actively with stakeholders – including students, faculty, alumni, and industry partners – is crucial for developing responsive and effective educational programs. By fostering collaboration and communication, HEIs can align their offerings with the needs of the community and labor market, thereby increasing their relevance and impact.

Moreover, in an era of rapid change, HEIs must remain vigilant in monitoring regulatory developments and adapting their practices accordingly. Ensuring compliance with national and international



standards not only enhances institutional credibility but also promotes continuous improvement and accountability.

This study lays the groundwork for further exploration into the specific impacts of these strategies on institutional performance and student outcomes. Future research could investigate case studies of HEIs that have successfully implemented these strategic frameworks, providing valuable insights and best practices for other institutions.

In conclusion, the strategic recommendations derived from this research equip higher educational institutions with the tools necessary to navigate challenges, seize opportunities, and enhance their overall effectiveness. By adopting a balanced approach that emphasizes stability, quality, and innovation, HEIs can thrive in an increasingly complex educational landscape and fulfill their mission of providing quality education that meets the needs of society.

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SPACE-АНАЛІЗ ЯК ІНСТРУМЕНТ ДЛЯ СТРАТЕГІЧНОГО РОЗВИТКУ ЗАКЛАДІВ ВИЩОЇ ОСВІТИ

Дослідження присвячене SPACE-аналізу закладів вищої освіти (ЗВО), який є потужним інструментом для оцінки викликів і можливостей, що постають перед ними в умовах динамічного освітнього середовища. SPACE-аналіз дозволяє виявити ключові фактори, що суттєво впливають на функціонування ЗВО, а також розробити стратегічні рекомендації для їх подальшого розвитку. У статті акцентується на необхідності забезпечення фінансової стабільності шляхом оптимізації витрат, що передбачає проведення детального аналізу фінансових показників для досягнення ефективності без компрометації якості освіти. Окрім цього, диверсифікація джерел фінансування через залучення додаткових ресурсів, зокрема грантів, партнерств з бізнесом та благодійними фондами, є важливим кроком для забезпечення сталого розвитку ЗВО. Підвищення якості освітніх послуг розглядається як пріоритетна задача, що вимагає інвестицій у розвиток викладачів та модернізацію навчальних програм відповідно до сучасних потреб ринку праці. Дослідження також наголошує на важливості підтримки інфраструктури, зокрема технічної модернізації класів, лабораторій та обладнання, а також впровадження цифрових технологій, що сприяють підвищенню доступності освіти. Крім того, у статті викладені стратегії для підвищення репутації та бренду ЗВО. Це передбачає впровадження ефективних комунікаційних стратегій, активну участь у міжнародних рейтингах, залучення випускників до розвитку закладу, а також дотримання національних та міжнародних акредитаційних стандартів. Визначаються агресивні стратегії, спрямовані на інновації в навчальних програмах, розширення міжнародних ринків шляхом залучення іноземних студентів і налагодження партнерських відносин з провідними закладами освіти світу. Активна участь у дослідницькій діяльності також є важливим фактором, що сприяє зростанню і конкурентоспроможності ЗВО. Оборонні стратегії, визначені в дослідженні, спрямовані на підтримку фінансової стабільності, розвиток людських ресурсів, а також дотримання нормативних вимог, що дозволяє закладам адаптуватися до зовнішніх змін.

Ключові слова: SPACE-аналіз; заклади вищої освіти (ЗВО); інфраструктура освіти; фінансова стабільність; якість освіти.

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