



ENHANCING HIGHER EDUCATION WITH SMART CAMPUSES: STUDENT INSIGHTS AND PERCEPTIONS AT THE UNIVERSITY OF LIFE SCIENCES “KING MICHAEL I” TIMIȘOARA

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Abstract: This study explores student perceptions regarding Smart Campus development, focusing on Romania’s western region and the University of Life Sciences “King Michael I” from Timișoara. Rapid technological evolution drives universities to adopt innovative campus designs integrating digital resources and sustainable infrastructure. Our research, based on a survey of 245 high school and university students, underscores the importance of intelligent learning environments, advanced security, socialization elements, and eco-friendly solutions. Results show a strong preference (89%) for tangible, technology-augmented campus experiences over purely virtual ones. Key demands include biometric security, GHG reduction, and accessible learning spaces. Findings advocate a hybrid development model blending sustainability, user-driven design, and robust digital integration, offering recommendations for a future-ready, human-centered Smart Campus.

• Introduction

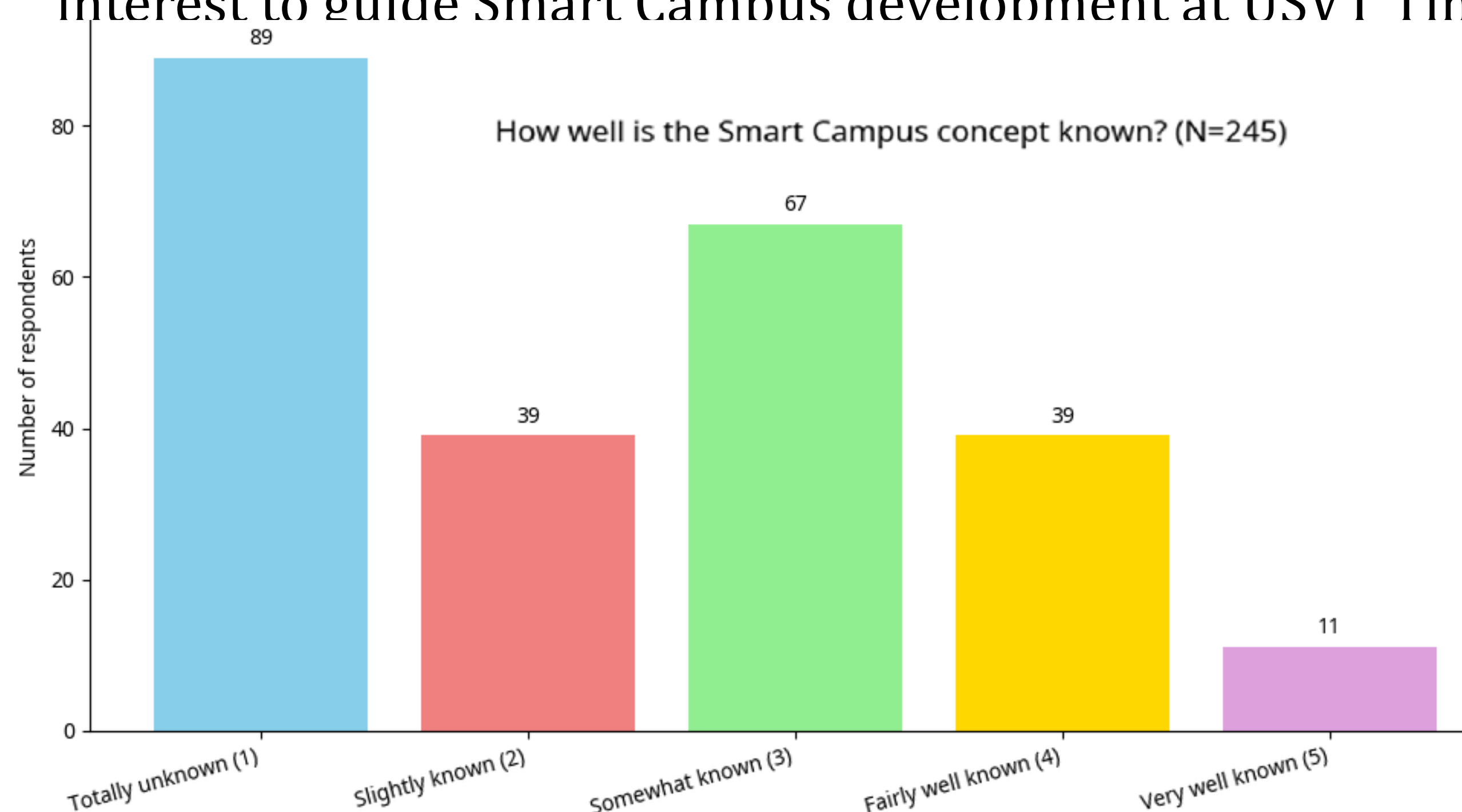
The global shift towards technologically advanced educational environments has highlighted the Smart Campus as a transformative paradigm. Smart Campuses leverage digital technologies, data analytics, and sustainable infrastructure to create interconnected, efficient, and student-centric learning experiences. This study investigates student perceptions at the University of Life Sciences “King Michael I” from Timișoara to inform a future-ready Smart Campus, aligning infrastructure and policy with student expectations.

Table 1. Ranking of Main Smart Campus Components Importance (Qualitative Synthesis from Questionnaire Analysis)

Smart Campus Component	Perceived Importance by Respondents (N=245)
Smart Learning	Considered by respondents as THE MOST IMPORTANT component.
Smart Socialization	Considered by respondents as THE SECOND MOST IMPORTANT component.
Smart Living	Considered important, adjacent to the learning process in Smart Campus.
Smart Safety & Security	Considered important, adjacent to the learning process in Smart Campus.
Smart Health	Considered important, adjacent to the learning process in Smart Campus.

• Material and method

A quantitative research methodology was employed, using a structured online questionnaire distributed nationally with a focus on Romania’s western region, targeting high school and university students (N=245). The questionnaire assessed awareness and interest in Smart Campus components, including: * **Smart Learning** * **Smart Living** * **Smart Safety & Security**: * **Smart Socialization** * **Smart Health**: Data analysis focused on identifying trends, preferences, and key areas of interest to guide Smart Campus development at USVT Timișoara.



• Results and discussions

- **Familiarity:** Varied; ~33% (89 respondents) new to the concept, only 11 very familiar. Suggests need for awareness campaigns.
- **Campus Preference:** Overwhelming 89% prefer a physical, real-world Smart Campus augmented by technology over a purely virtual one.
- **Importance:** ‘Smart Learning’ ranked most crucial, followed by ‘Smart Socialization’.
- **Smart Learning Highlights:** High importance for ‘Smart Classrooms’ and ‘Access to online teaching materials’. Lower for ‘Virtual presence at courses’.
- **Smart Living Highlights:** ‘Automated accessibility for people with disabilities’ ranked highest. Smart utilities and dorms also key.
- **Smart Safety & Security:** ‘Intelligent internet network’ most important. Biometrics and speed sensors less so, but suggestions included biometric access control.
- **Smart Socialization:** ‘Green areas for study/relaxation’ and ‘Digital partnerships’ highly valued. Physical event zones important.
- **Smart Health:** High interest in ‘Sports complex with digital training’ and ‘Interactive outdoor sports equipment’. Smart medical offices and AI counselors also valued.

Key Discussion Points: * Students value tangible campus experiences enhanced by technology. * Holistic development is needed, balancing academic, social, and well-being aspects. * Inclusivity and accessibility are major student priorities. * Robust digital infrastructure and security are fundamental expectations.

• Conclusions

Student perceptions strongly favor a hybrid Smart Campus model that integrates physical infrastructure with user-driven technology. Key priorities include advanced smart learning environments, robust security, accessible facilities, and spaces fostering social interaction and well-being. The findings underscore the need for universities to: 1. Develop a phased Smart Campus roadmap based on student feedback. 2. Enhance digital literacy and awareness. 3. Invest in secure and reliable digital infrastructure. 4. Promote sustainable and inclusive design principles. 5. Foster a culture of co-creation with the student body.