UNIVERSITI TEKNOLOGI MARA

5th I-CReST 2025

INTERNATIONAL CONFERENCE ON RESEARCH AND PRACTICES IN SCIENCE, TECHNOLOGY AND SOCIAL SCIENCES

SYNERGY FOR FUTURE SUSTAINABILITY:
BRIDGING SCIENCE, TECHNOLOGY AND HUMANITIES

Abstract Book

UNIVERSITI TEKNOLOGI MARA
CAWANGAN SELANGOR, KAMPUS DENGKIL
MALAYSIA

13th SEPTEMBER 2025

ORGANISED BY: Centre of Foundation Studies

STRATEGIC PARTNER: UiTM Global

IN COLLABORATION WITH: UTM

I-CReST 2025:036-012 – A Systematic Review of Virtual Desktop Infrastructure (VDI) Implementation for Smart Campus in Higher Education Institutions

*[1]Mohd Rashid Abu Bakar, [2]Jasni Mohamad Zain, [3]Mohamed Ariff Ameedeen

[1]College of Computing, Informatics and Mathematics, Universiti Teknologi MARA, Cawangan Selangor, Kampus Shah Alam, 40450 Shah Alam, Selangor, Malaysia.

[2]Institute of Big Data Analytics and Artifical Intelligence (IBDAAI), Universiti Teknologi MARA, Cawangan Selangor, Kampus Shah Alam, 40450 Shah Alam, Selangor, Malaysia.

[3]Faculty of Computing, Faculty of Computing, Universiti Malaysia Pahang Al-Sultan Abdullah 26600 Pekan, Pahang, Malaysia.

*E-mail: mrashid@ump.edu.my

ABSTRACT

The use of digital technologies has led to the advancement of higher education institutions to establish smart campuses in a bid to improve on the efficiency of the institutions and the quality of education. VDI has become a popular choice as it provides central processing, flexibility, and enhanced access. However, the implementation of VDI in higher education has several challenges that need to be understood with the help of enablers, barriers, and impacts. This paper will give a comprehensive understanding of VDI as a solution for smart campuses in higher education with the focus on the factors that affect success, the problems encountered and the consequences on teaching and learning. The study has the following objectives: The first is to determine the major factors that enhance the chances of successful adoption of VDI in smart campuses. The second objective is to explore the problems that institutions go through during its implementation. The third objective is to assess the effect of VDI on the quality of teaching and learning experiences in higher education. The research design that is used in this paper is a systematic review and the articles used in this study are peer-reviewed articles, conference and papers, reports published from 2020 to 2024. The criteria for inclusion of the studies were based on the requirement that the studies must have described the application of VDI in the higher education system and how it integrates with the smart campus. The results show that successful VDI adoption is dependent on solid infrastructure, organizational infrastructure, and user preparedness, whereas major challenges include high costs of implementation, security risks, and user's reluctance to change. The review also emphasized the resources, positive effectiveness impacts in of supporting VDI the which hybrid include learning easy model, access and to reduction digital in the need for physical infrastructure and equipment. These findings support the notion that VDI is an essential tool in the realization of smart campus strategies and enhancement of sustainable learning practices. The study concludes that although VDI has a great potential to transform higher education and improve the quality of learning and teaching, the implementation of VDI poses several challenges that must be addressed including the need for proper planning, engagement of all the stakeholders and investment in the infrastructure and cybersecurity. Based on the findings of this study, it is recommended that higher education institutions should adopt a staged approach in the implementation of VDI and this should be done in conjunction with other smart campus

solutions. Future research should emphasis on providing guidelines and best practices for VDI adoption and evaluating the effects of VDI on organizational performance and student achievement in the long run. This review provides unique insights into overcoming barriers and offers strategic recommendations for its sustainability. Hence, this paper offers a valuable addition to the existing literature on digital transformation in higher education and valuable recommendations for academic leaders, IT managers and policy makers.

Keywords: Education digitalization; Digital transformation in education; Higher education; Smart campus; Virtual desktop infrastructure (VDI)