Higher Education and Smart Education System: The Impact of Learning Style and Environmental Characteristics in the State of Kuwait

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Abstract—The purpose of this research is to explore the implementation of smart education systems and approaches in the State of Kuwait's higher education. The determinants of the successful smart education system, particularly learning styles of students and the learning environment characteristics also investigated. The advancement of information and communication technologies has paved the shifts in learning and teaching with countries such as Kuwait have progressively integrated ICTs and smart technologies into their education systems. This research conducted a systematic literature review on smart education systems in Kuwait and the determinants of its successful implementation. A systematic keyword strategy was utilized for secondary data search from databases and archives, including university e-library and scholarly scientific research and various article database. A systematic content analysis was conducted by analysing the gathered secondary data. Findings from this study suggested that various tools and technologies used in implementing smart education in Kuwait however, learning styles and learning environmental characteristics had significantly influenced the success of the adoption of smart education in Kuwait's higher education. The findings of this study demonstrated practical implications in higher education, especially in terms of designing smart education systems in emphasizing the learning styles of students as well as the necessary learning environment factors for successful smart education. The smart education systems to facilitate flexible and efficient learning of higher education students in Kuwait along with learning styles of students and learning environmental factors are considered in designing smart education.

Keywords—higher education, Kuwait, smart education, learning styles, learning environment

1 Introduction

The emergence of technological advancements provides several opportunities into the higher education sector worldwide. Recently, emerging technologies are integrated

in education systems, particularly in developing countries leading to the rise of the smart education system in different parts of the world. According to Martin et al. [1], there are various initiatives of smart education to implement advanced technology to foster smart pedagogy. He also added smart education is an emerging concept that offers opportunities for the improvement and sustainability of education systems worldwide [2]. As highlighted by Cebrian et al. [3] the adoption of smart education as a principal agent for addressing sustainability challenges in the educational setting can be considered. Smart education is widely used in the higher education sector in support of the facilitation of integrating education for sustainable development methodologies [3]. In today's digital age, the importance of the adoption of advanced technologies has become apparent to cope with the significant growth of smart devices, technologies and systems. Thus, the application of smart technologies in higher education systems is an emerging trend in the current time [4]. This means that the integration of smart technologies plays an important role in fostering sustainable long term learning and motivational solutions in higher education.

As smart education is gaining momentum in the higher education field, it is also simultaneously providing a new platform for the enhancement in the learning process in Kuwait. In 2008, the Kuwaiti Ministry of Education had issued a decree to establish a supervisory panel in facilitating the growth of e-learning in the country [5]. In addition to this, mobile learning technology is already being used in higher education in Kuwait influencing student's learning styles and satisfaction [6]. While the role of smart education is widely studied in developing countries, there is little literature available on exploring smart education in the Kuwaiti higher education setting. In line with this, the purpose of this research is to explore smart education systems and approaches utilized in the State of Kuwait's higher education and investigate the determinants of the successful smart education system, particularly learning styles of students and learning the characteristics of the environment.

2   Smart education in higher education

From a general perspective, the concept of smart learning environments utilizing the smart technologies during the learning environments in pursuit of promoting positive impact on student's learning experiences [3]. Refer to the same authors, a smart learning environment must be equipped with digital and smart devices that aims to promote a faster and better learning process. In line with this, Salah et al. [7] asserted that smart education systems benefit students, educators, and educational institutions directly while fostering sustainable learning and growth. Figure 1 shows the categories of characteristics in smart classroom setting.

Fig. 1. Dimensions and categories of characteristics in a smart classroom [3]

As shown in Figure 1, there are three important components of a smart classroom – technological solutions, environmental conditions, and performed processes. According to Cebrian et al. [3] the emergence of smart education as new development allowing the new learning paradigms, pedagogies, teaching, and learning methodologies that are more suit to the twenty-first century. Thus, a learning environment is considered smart with implementation of adaptive technologies or if the learning environment is designed with innovative features and capabilities towards promoting smart learning [8]. Through this, suggesting in to improve the learning outcomes, high quality learning environment must be designed. A smart classroom system comprises the integration and use of smart technologies such as internet and mobile technologies [8]. Yet, smart classrooms are designed differently in various higher education settings. Figure 2 shows an example of a smart school solution structure.
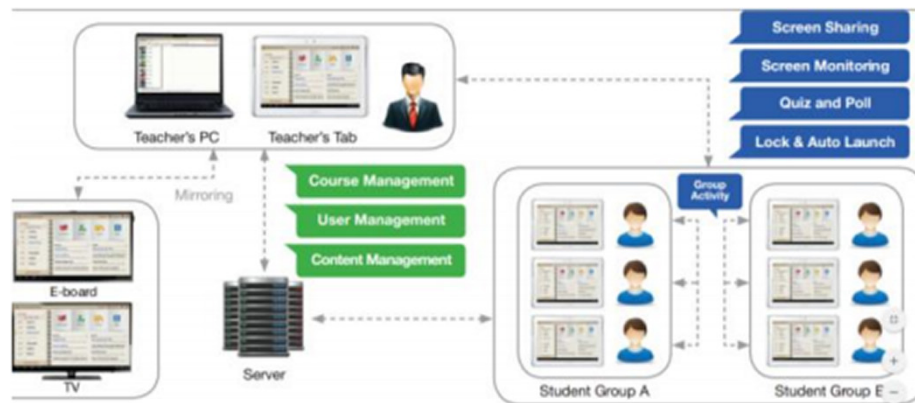

Fig. 2. Samsung smart school solution structure [8]

As shown in Figure 2, smart classroom environments have unique features and functions but sharing common benefits, including increased interactivity, efficient classroom management, personalized learning, and more effective monitoring of students. In addition to these benefits, the smart learning environment setup allows learners to access multiple digital resources and provide self-learning and self-motivated pedagogies [4]. By this, a smart learning environment learner-initiated fostering adaptiveness,

reflectiveness, and flexibility in learning. Therefore, the smart classroom design can be viewed as the next evolutionary generation of universities – smart universities [9].

3   Improved learning outcomes from high quality learning environments

Although there is evidence of significant integration of digital technologies in education Salihu, & Ramadneh, [10] yet they are still regarded as optional in many cases. Better articulation of how digital technologies improved learning outcomes is required. Improved learning outcomes require high quality learning environments. There are three general principles about high quality learning environments, all of which can be enhanced through the good use of digital technologies.

Principle 1. There is a direct relationship between what students learn and how they learn. Students are more likely to achieve high quality learning outcomes when they have the opportunity to learn content within a meaningful context.

Principle 2. Developments in personalising learning provide learning opportunities for every student. Personalising learning referred as within their university, the students should have excellent teaching that suits them; building on what they know, fitting them for what they aspire to, and helping them reach their full potential. Thus, every student can learn.

Principle 3. All learning should be student-centred. Through the implementation of digital technologies, learners able to engage in learning that is tailored to their particular situation.

4   Smart learning environment in higher education in Kuwait

Kuwait is a developing country and a member of the GCC in continuing to invest efforts and resources towards achieving sustainable development. In 2001, an e-learning center was established by Kuwait University to promote online learning through the use of the online training system [11]. In comparison to the other GCC member states, Kuwait is being seen as falling behind concerning the adoption of e-learning and smart education due to lack of innovation and productive capabilities. In 2008, the Ministry of Education had established e-learning strategies as part of its effort to develop interactive learning environment and focusing on introducing technology in educational institutions across the State of Kuwait [5]. He explained the e-learning strategy aims to ensure that the country is able to cope with learning approaches and enhancing the creative capabilities and teaching capacities of students and teachers, respectively.

To facilitate effective smart education in higher education in Kuwait, higher education leaders must understand smart learning as a strategic advantage. By implementing smart education, the current learning process able to cope and adapt to the continuous changes in the learning environment and technologies. Smart technologies are already being adopted in higher education in Kuwait, but there are still some barriers to its successful implementation. The authors also explained that among the barriers of Kuwaiti

experiences in pursuing smart education, included cost, time, technology, attitude, administrative support, and language barriers.

On the other hand, among the critical success factors to the adoption of smart education in higher education in Kuwait, including learner's attitudes and environmental characteristics. In the study of Al-Hunaiyyan, et al. [12] changing the attitudes and behaviors in the educational sector is a critical factor in achieving successful implementation of smart classroom environment in Kuwait. The authors also explained that a major change, such as transitioning to a smart learning environment is challenging, and therefore, the principles of change management should be applied appropriately. As proposed by Al-Hunaiyyan et al. [12] implementing mobile learning in smart classroom can promote new learning styles and environmental conditions that influence motivated learning among university students in Kuwait. Figure 3 shows an m-learning model that can be adopted in higher education in Kuwait to integrate smart learning.
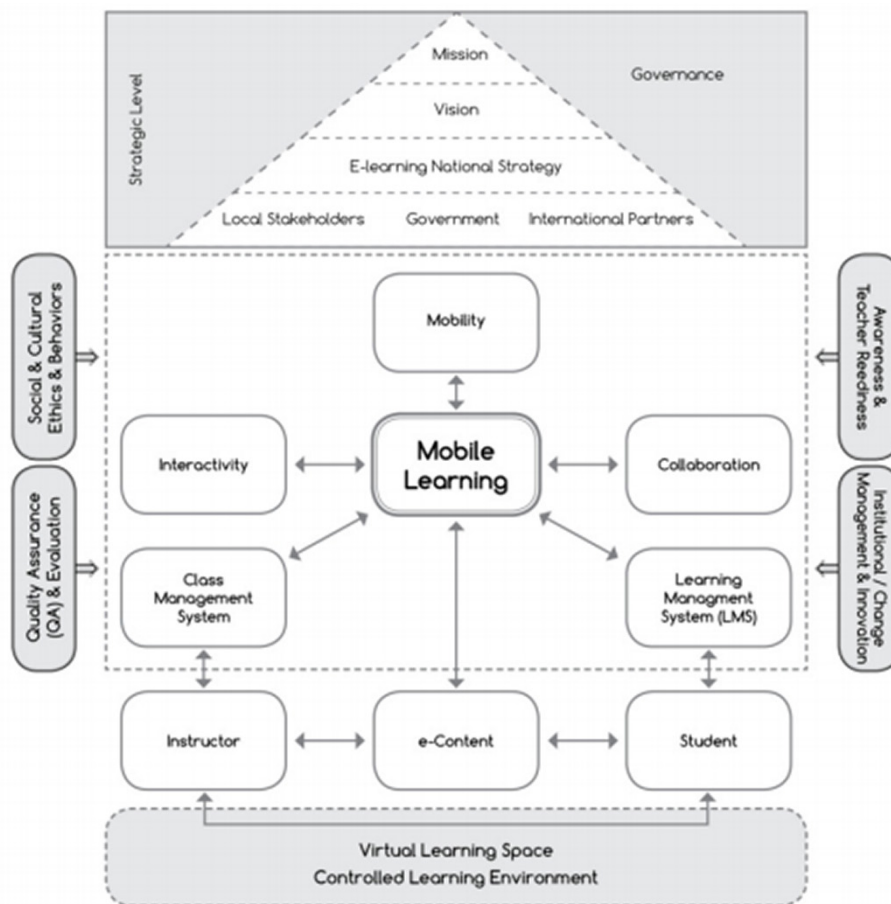

Fig. 3. New m-learning model [12]

Moreover, the adoption of smart technologies in higher education in Kuwait also significant influences on the academic and social lives of students. In the study of Ali [13], the confidence in the use of smart technologies is dependent on the student's learning styles and preferences. As explained by the same author, the students are effectively adapt to the smart learning environment through the suitable implementation of smart technologies to their learning styles and preferences. The educators must create an interactive and smart environment with smart technologies as an essential part of the smart classroom environment to encourage active participation and coping with the unique learning styles of students.

Despite the positive assessments of the adoption of smart education systems in higher education in Kuwait, there are still some arguments regards to the unsuccessful attempts of the implementation of smart technologies in classrooms. According to Alfelaij [14] the integration of technology is still unsuccessful in Kuwait due to cultural, technical, and contextual challenges. The same author explained that gender segregation, poor connectivity, lack of smart technology infrastructure and differing learning and teaching styles are among the major challenges contributing to the failure of efficient adoption of smart education in higher education in Kuwait.

On the contrary, mobile learning demonstrating slightly more satisfactory among college students in Kuwait [6][15][16]. Concerning this, the study of Al-Awidi and Aldhafeeri [17] suggested that teachers are moderately ready for the implementation of smart curriculum as an alternative medium of the learning process. By this, promoting higher levels of readiness among teachers in higher education in Kuwait regarding the adoption and implementation of smart education system is required.

Finally, the recent Covid-19 pandemic resulted in high emphasis on the importance of smart learning and heighten the awareness for smart learning style [18]. According to Lily et al. [19] online, mobile, and smart learning become the important responses of different countries, particularly Arab nations, to the Covid-19 crisis. Therefore, smart technologies play an important role in the evolution of education and simultaneously responding to global outbreaks and pandemic.

5   Conclusion

This research focused on exploring smart education systems and approaches utilized in the State of Kuwait's higher education, and investigate the determinants of successful smart education system, particularly learning styles of students and the learning environment characteristics. Findings from this study yielded mixed results wherein there were positive and negative implications of the adoption of smart education systems and approaches in higher education in Kuwait. At one point, this study found that smart education is considered as a new educational paradigm in higher education contributing to more enhanced learning and academic achievement. On the other hand, there are also findings of the unsuccessful adoption and implementation of smart education systems in higher education in Kuwait. As such, it is recommended for the Ministry of Education to develop digital competence and the use of technology for learning to create a flexible smart learning work environment in alignment to the goal of education and human capital improvement as part of the 'new Kuwait' strategy 2035 [20].

Furthermore, future research is recommended with regards to this topic to gain better awareness and understanding of the position of smart education in the context of higher education in Kuwait.

6   References

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7　　Authors

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