SMART LEARNING ENVIRONMENT, PERCEIVED USEFULNESS, PERCEIVED EASE OF USE, AND BEHAVIORAL INTENTION IN UAE EDUCATION

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SULTAN IDRIS EDUCATION UNIVERSITY

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ABSTRACT

The objective of this study is to examine the effect of smart learning environment (SLE) on behavioral intention (IUSL) in UAE education. Besides, this study also aimed to test the mediation effect of perceived usefulness (PU) and perceived ease of use (PEOU) in the relationship between SLE and IUSL in UAE education. This study applied a quantitative research approach. The questionnaires were used for data collection. The respondents were chosen by using a simple random sampling technique, which comprised students from UAE secondary schools. Data analysis was performed on the 387 valid questionnaires by using exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modelling (SEM). The findings revealed that 68% (R^2 =0.68) variation in IUSL is explained by SLE, PU and PEOU. The specific findings showed that SLE has a significant effect on IUSL (β=0.505, p=0.020), SLE has a significant effect on PU (β=0.980, p=0.000), SLE has a significant effect on PEOU (β =0.985, p=0.000), PU has a significant effect on IUSL (β =0.163, p=0.023), and PEOU has a significant effect on IUSL (β=0.985, p=0.000). The findings also revealed that PU partially mediates the relationship between SLE and IUSL. However, PEOU fully mediates the relationship between SLE and IUSL. This study provides an immeasurable contribution mostly to academia and practitioner. This study offers an expanded technology acceptance model for smart learning environment that could assist researchers in adopting management practices. Besides, this study provides a guideline for the establishment of a smart learning environment for positive behavior among students in the UAE education context.

PERSEKITARAN PEMBELAJARAN BESTARI, PERSEPSI KEBERGUNAAN, PERSEPSI KEMUDAHAN PENGGUNAAN DAN NIAT BERTINGKAH LAKU DALAM SEKTOR PENDIDIKAN DI UAE

ABSTRAK

Objektif kajian ini adalah untuk mengkaji kesan persekitaran pembelajaran bestari (SLE) terhadap niat bertingkah laku (IUSL) dalam pendidikan UAE. Selain itu, kajian ini juga bertujuan untuk mengkaji kesan pengantaraan persepsi kebergunaan (PU) dan persepsi kemudahan penggunaan (PEOU) dalam hubungan antara SLE dan IUSL dalam pendidikan UAE. Pendekatan dalam kajian ini adalah kajian kuantitatif. Soal selidik telah digunakan untuk pengumpulan data. Responden dipilih menggunakan teknik persampelan rawak mudah, yang terdiri daripada pelajar dari sekolah-sekolah menengah UAE. Data dianalisis berdasarkan 387 soal selidik yang sah dengan menggunakan teknik Analisis Faktor Penerokaan (EFA), Analisis Faktor Pengesahan (CFA) dan Pemodelan Persamaan Struktur (SEM). Penemuan mendedahkan bahawa 68% *(R^2=0.68)* variasi dalam IUSL dijelaskan oleh SLE, PU dan PEOU. Secara spesifik, penemuan itu menunjukkan bahawa terdapat kesan signifikan SLE terhadap IUSL (β=0.505, p=0.020), terdapat kesan signifikan SLE terhadap PU (β=0.980, p=0.000), terdapat kesan signifikan SLE terhadap PEOU (β=0.985, p=0.000), terdapat kesan signifikan PU terhadap IUSL (p=0.163, p=0.023) dan terdapat kesan signifikan PEOU terhadap IUSL (β=0.985, p=0.000). Penemuan turut membuktikan PU sebagai pengantara separa dalam hubungan antara SLE dan IUSL. Namun. PEOU menjadi pengantara penuh dalam hubungan antara SLE dan IUSL. Kajian ini memberikan sumbangan yang signifikan kepada ahli akademik dan pengamal industri. Penemuannya telah menambahbaik penggunaan model penerimaan teknologi yang diperluaskan untuk persekitaran pembelajaran bestari yang boleh membantu pengkaji dalam menggunapakai amalan pengurusan. Selain itu, kajian ini juga menyediakan garis panduan untuk mewujudkan persekitaran pembelajaran bestari untuk menghasilkan tingkah laku positif dalam kalangan pelajar di sektor pendidikan UAE.

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LIST OF ABBREVIATIONS

ADEC	Abu Dhabi Education Council
ASCs	Advanced smart classes
ANOVA	Analysis of Variance
AFDL	Alliance for future digital Learning
AI	Artificial Intelligence
BSCs	Basic smart classes
BL	Blended Learning
BMP	Business Management programme
C	Control
CFA	Confirmatory Factor Analysis
CRM	Citizen Relationship Management
CT	Critical Thinking
DF	Degree of Freedom
DV	Dependent Variable
DLW	Digital Learning World
DIFC	Dubai international financial Centre
DSOA	Dubai Silicon Oasis Authority
E	Environment
ED	Extremely Dissatisfied
EFA	Exploratory Factor Analysis

EI	Enhancing Information
ERP	Education Resource Planning
ES	Extremely Satisfied
F2F	Face to Face
F	F Test
GERM	Global Education Reforms
GI	Group Interaction
HTs	Heterogeneous Technologies
I	Innovation
ICT	Information and Communication Technology
IASLEs	International Association for Smart Learning Environments
IoT	Internet of Things
ISCs	Intermediate smart classes
ITSs	Intelligent Tutoring Systems
ITU	International Telecommunications union
INLS	Integrated National Literacy Strategy
IV	Independent Variable
K	Knowledge
KMO	Kaiser-Meyer-Olkin
LS	Learning Skill
LCM	Leadership Crisis Man agent
LMS	Local Management Style
MENA	Middle East and North Africa
MEASA	Middle East Africa and South Asia

MBRGI	Muhammed bin Rashid Global Initiatives
MoE	Ministry of Education
MCS	Multi-Collinearity Statistics
MD	Moderately Dissatisfied
MS	Moderately Satisfied
NL	Neutral
PCs	Personal Computers
PCA	Principal Component Analysis
PEOU	Perceived Ease of Use
POS	Perceived Organizational Support
R	Correlation Coefficient
TAM	Technology Acceptance Model
TEIS	Teaching Enterprise Information system
TRA	Telecommunications Regulatory Authority
TPB	Theory of Planned Behavior
TLFs	Traditional learning frameworks
TMSs	Talent Management Strategies
S	Skill
SD	Slightly Dissatisfied
SDGs	Strategic Development Goals
SE	Smart Environment
SI	Smart Intelligence
SLE	Smart Learning Environments
SLP	Smart Learning Program

SLPs	Smart learning projects
SLC	Smart learning center
SLP	Smart Learning Performance
SP	Smart Pedagogy
SPSS	Statistical Package for the Social Sciences
SS	Slightly Satisfied
ST	Smart Technology
SISS	Swiss International Scientific School in Dubai
STEM	Science, Technology, Engineering, and Mathematics
U	Understanding
UAE	United Arab Emirates
UNICEF	United Nations Children's Fund
UNESCO	United Nations Educational, Scientific and Cultural Organization
UTATUT	Unified Theory of Acceptance and use of technology
VIF	Variance Inflation Factor

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The usefulness of smart devices has increasingly mothered a new dimension into the way people worldwide live and behave, especially in academia and business. For that reason, Orchard et al. (2017) believed that the above gave rise to the idea that society can demonstrate its benefits from information technology (IT) since it advances every single time. Currently, most e-learning platforms for instance; pamoja, skype and zoom have enabled the adoption of smart learning tools which allow learners to have online classes/virtual classes. Tracing back from 2012, the UAE has had ongoing financing of smart learning (SL) projects as well as providing both students and teachers with laptops and making most educational platforms accessible and available for all interested users (Edarabia, 2020). As the Covid-19 pandemic continued to spread in the early 2020, the government of the United Arab Emirates (UAE) reminded schools to

stay closed without pausing educational activities, this alone gave chance to the swift adoption to Smart Learning environments (SLE) in the UAE and some parts of the world (Mohammed, 2020). Smart learning environments are a composition of elemts like control (schedules work, personalised content and self-assessment). Group interaction seen from peer interaction, learner instructor interaction, discussions and learner content interaction). Then smart learning technologies (e-books, and smart classrooms, learning analytics) and environment (adaptive hypermedia, intelligent tutoring systems and learning analytic systems). All these are a prerequisite to the successful implementation of Smart Learning technology implementation in academic institutions. The UAE Ministry of Education (MoE) further guided with the most planned distance learning system for all students in the UAE (MoE, 2020) (Ayman H., 2021). These online lessons are interactive in nature since they include multimedia presentations, virtual group discussions, individual inquiry and sharing of screenshots from teachers. Smart learning environments are understood to be the pillar of digital-based schools, supported by improved infrastructure, educational scientific and creative facilities (Qatami, 2019). All public schools received support from the government to enable the implementation of the smart learning environments (UAE-MoE, 2021). Therefore, the existing accelerated educational changes brought by the outbreak of COVID-19 worldwide pandemic demanded for effective changes from traditional learning methods to the New Normal discipline of the educational management. Expressively IoT-based technologies were elucidated by Siripongdee (2020) as all various gadgets through different networks were embraced in Blended Learning (BL) which combines physical class teaching with ICT instruction.

As social distancing practice in societies incited the shift from Traditional to face-to-face (F2F) meetings to virtual meeting as a preventive method during the hard times when the spread of COVID-19 pandemic was at its peak, many Internet-of-Things (IoT) based tools were to be added in class activity delivery to create and enhance a smart learning environment (SLE) worldwide. Further, the formation of virtual or online learning communities and teaching enterprise information system (TEIS) in UAE reflects a smart learning environment whose effect on behavior intention is investigated. Besides, OECD and UNESCO are sponsoring better initiatives such as Global education reforms (GERM) as a way of causing improvements in the access and the quality of education around the world. ICT was said to be the provider and groundwork for the complete conversion of a smart learning environment since it conveys most of the tools required to improve teaching and learning and promote learner-centered learning environments. For example, affordable maintenance of classroom networks that can host digital content and associated management systems. Amplified technology application for preparing and planning class material and lessons. SLE achievements are envisaged to be in the operation of all or part of the unit plan designed in the training hence the use of technology in new ways with students' increase in project-based learning activities.

Arif et al. 2015 and Farid et al. 2018 stressed on the massively unique opportunities extended to education by Smart Learning Environment (SLE), they embraced the potential to reach the new learners for delivering education. For instance, e-learning platforms are similarly assisting to issue exams and reports to students as managers in some schools. Learners utilize online application to work on all essays and even access academic reports at the Swiss International Scientific School in Dubai

(SISS). Amir Yazdanpanah (2019) also said that SISD aimed at coming up with a connected school thus indicating a move toward SLEs by many institutions. As Learners in Dubai cooperate with others in China and scientists within Switzerland to come up with a product, classrooms have become less restricted to the physical location since there is a collaborative real-time learning which is intended to be reached sustainably, since smart learning instruments support learning that occurs any place and anytime. Equally, school administrators are becoming more experienced at using Ed Tech tools while implement learning activities in a SLE.

As Jon K. (2015) alleged that, ICT advancement allowed professional development, the school leadership is also assumed to occur across multiple levels, the national or provincial ministry of education sets overall policy, curricula, and national assessment standards, yet being used in the day-to-day decision making for SLE adoption. Contrary, when studying a SLE, scholars have been more reluctant to examine its relationship with behavioral intention particularly in the UAE education sector. Instead, the seemingly campaigned technology has failed to have reliable systems, it is associated with high costs in budgets, and it has unreliable developers, low skilled professionals, motivation gaps plus weak methods of monitoring the student's online performance (Evans, 2016). Worse still, most of the people still find smart learning environments vague whenever compared with the Traditional transformation hence explaining the behavior intention of UAE population even though the development of new technologies is thought to have enabled learners to learn more effectively, efficiently, flexibly and comfortably. Therefore, as the concept of Smart learning environment is receiving attention in Education management and research; leadership and human resources should have sufficient confidence to significantly

influence smart education or produce a positive association with ‘smart education.’ (Wang and Junela, 2021)

Smart learning environments (SLEs) should incorporate content engagement, personalization of learning activities, and alignment to formative assessment methodologies, while technology gives new opportunity for curriculum and instruction. Educators can capitalize on students' interests by connecting and capitalizing on learning by offering access to resources, events, and information from both inside and outside the classroom (Grant, 2018). As a result, educational institutions are expected to have a better understanding and informed instructional decision-making when all of these educational resources have gained timely and appropriate data collecting backed by digital tools.

Both the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB) have been adopted by this research with all information regarding implementation, and effect of smart learning environment on student’s ability, education sector and educators’ point of view was harvested using a survey method through quantitative analysis. It is thus both an insight and guide for policy makers, implementers, educationists and future scholars. Results from this study also enrich the current literature on Smart Learning Environment (SLE) by increasing knowledge of the phenomenon through combining TAM and TPB as presented above. In summary, the introductory chapter of the Thesis establishes background of the research, problem statement, research objectives and the hypotheses, conceptual and theoretical framework. It also represents the scope, significance of the research and provide a brief outline of the thesis.

1.2 Background of Study

The early 1980s presented US government with deployments in text selection and analysis which was released to public in the year 1984. By then there was no mouse technology, no GUIs, and no color. Only repeatable skills' practice, Individualized pacing plus fostered commercial interest in CAI modules and CAI research were prominent. In the early 1990s World Wide Web/Internet; www effect internet-connected devices (Friedman T, 2016). At the time of Second International Conference for Learning and Teaching in the Digital World (DL) \ Smart Learning (SL) between 2006-2008, 26 September 2006: Facebook became public 2007: Twitter, Kindle 2007: IBM begins work on Watson, a "cognitive computer" Jan 2007-Dec 2014: AT&T's mobile data usage:+ 100,000% (John H. Knigh, 2017).

The recent past years have engaged educational researchers in effective investigation smart learning environments (SLEs) which are basically involve adaptive systems which improve learning experience reflecting knowledge access, preferences and progress learning traits, feedback and guidance, features increased degrees of engagement, and uses rich-media. (Singh, 2017). Basing on the findings of Garira et al., 2019 & Mohammad (2017) studies indicate an overall movement towards enhancing the quality of education in schools globally for the past three decades, guided by substantial research in modern education with the aim of ensuring highly effective transfer of knowledge. Smart Learning Environment (SLEs) have mothered several terms and concepts for instance, Blended learning (BL), smart classroom, hybrid, Smart learning environment, smart space, Ubiquitous/ Pervasive computing, virtual classes (online learning), E-learning, Distance learning, Learning Management System and

Flipped classroom. (Cockrum, 2017; Altamini & Ramdan, 2016). Even the Smart learning Space can capture entire instructions during class for review and evaluation after class by both teacher and students. In summary Smart learning Environment (SLEs) are becoming a promising path which will create new learning techniques which do not only better learning effectiveness but enhances the learning experience. All the above are the results factors such as environments equip learning institutions with the ability to support an array of learning and teaching activities in diverse subject matters at different levels.

Since the 1980s, individual behavioral intention toward emerging technologies have become a research hotspot in the field of information systems and education. For that reason, a number of models have been recognised to describe user's behavioural trends for instance the Technology Acceptance Model (TAM), the information technology acceptance models, and the Unified Theory of Acceptance and Use of Technology (UTAUT). Through these models, it has been assumed easy to predict factors associated with the behavioral intention of learners towards smart learning technologies. Recently, studies have shown that users' behavioral intention of information technology is necessary if one is to understand factors associated with the adoption of smart learning technologies.

Behavioral intention analysis in the field of information technology is further explained by the technology acceptance model (TAM) which assumes that behavioral intention is formed by conscious decision-making process where attitude, perceived usefulness and perceived ease of use are a reality. Subsequently, any facilitating condition, perceived ease of use and perceived significantly predict behavioral intention

to use smart learning (Hamida & Mamum, 2022). As perceived ease of use refers to user's belief that using a particular system does not require too much effort, perceived usefulness means that people believe using a specific system will improve their performance. Perceived usefulness and perceived ease of use are regarded as cognitive factors, and use attitude is regarded as the causal factor for individuals' intention to guide future behaviour or eventually lead to specific behavior when performing specific behavior. Technology use is determined by behavioral intention, which is jointly determined by the attitude towards technology use and perceived usefulness, and the attitude towards technology use is jointly determined by perceived usefulness and perceived ease of use. Perceived ease of use affects perceived usefulness. Learners' acceptance of information technology in education require application of the model to analyze the related problems of the use of information technology.

Most of the new extremely heterogeneous technologies (HTs) and IoT-based applications accessed by various fields for example; pacemakers, blood pressure monitors, TVs, refrigerators, CCTVs, traffic lights, vehicles, and drones are integrated and supported by the SLE innovations. All and sundry relative technologies promote and incorporate IoT tools, including, cloud computing, big data, 5G cellular, and AI technologies (Celesti et al. 2019; Lee, 2019; Terroso-Saenz et al. 2019; Savjani, 2019; Miorandi et al. 2012). So, nearly everything: every location, device, software, sensor, etc., are connected to each other. In the same way Dubai is crowned to have prospered in converting into a global city, s regional business and tourism hub in the last two decades due to the established international reputation (Aisha B., 2017). Being an investment and economic center that diversified the economy, embraced regulatory reforms through vast developments in a number of sectors, all committed to the world

–class digitalization of the city, the city is performing well when related to SLE. His Highness Vice President and Prime Minister of the United Arab Emirates, Mohammad Bin Rashid whispered that technology was playing the role of enabler rather than a principal goal, thus the innovation allowing customers to scan through a product, revealing its origin and certification (Courtney T., 2016).

Smart learning is one of the most important developing learning paradigms since it allows employees to learn from anywhere and at any time. Despite this, workplace learning research has primarily concentrated on traditional e-learning settings, failing to capture the peculiarities of the new learning environment and demonstrate its impact on adoption. As a result, Junghwan Lee and Hwansoo Lee (2017) concluded that the rapid spread of smart devices and the invention of virtual technologies are altering the workplace learning environment. They have, however, failed to integrate staff educational demands with institutions' technology-oriented approach. As a result, the purpose of this research is to explore the distinct characteristics of smart learning and how these characteristics influence its adoption. This study compares the behavior of workers and HRD managers of SLE adoption as a learner and coordinator learning in order to provide a way for successful SLE adoption. The research revealed that smart learning adoption requires mobility and personalization. Employees and HRD managers are divided on the adoption of smart learning, according to comparison analysis. HRD managers place a premium on perceived simplicity of use as a factor for adoption, whereas employees place a premium on perceived utility. Smart learning qualities like as mobility, personalization, interactivity, and collaboration have differing implications on perceived utility and ease

of use for the two categories. This study offers practical advice on how to properly use smart learning.

To ensure that students acquire critical skills and information for success, a strong curriculum should be linked to standards and credible evaluations. Nearly half of all middle school students in the United States questioned by Project Tomorrow reported a desire to have more control over their learning in order to spend more time on interesting subjects and study at their own pace. Additionally, Project Tomorrow (2014) testified 38% of teachers who used digital content where they supported students to advance critical thinking and problem-solving skills. Nevertheless, the results equally showed that about 60 % of school principals responded to the annual Speak up survey that indicated inadequacy in computers or devices with Internet access is a key challenge to the greater adoption of digital content in their schools. SLEs provide useful indicators of students' knowledge, skills, and progress in a variety of topics. Teachers can improve instruction in real time by using formative evaluations that are aligned with curriculum changes. Formative assessment of students' understanding during instruction provides both the student and the teacher with feedback that can be used to quickly assess learning, adapt content, personalize instruction, and improve outcomes, thanks to the increased access to student data provided by digital content. In 2014, Intel Corporation advocated formative assessments if students were to be empowered, moving from passive to active learners who understood their strengths and limitations, identified learning gaps, and devised a plan to close them. The provision of authentic learning opportunities for students is the result of various educational practices. Smart learning's goal is to use technology to bring real-world experiences into the classroom,

engaging students and preparing them for further education, employment, and citizenship in ways that traditional methods often fail to do.

The United Arab Emirates (UAE) began investing into the digital learning programme in 2012- Mohammed Bin Rashid Smart Learn (MBRSLP), which was intended to shape contemporary learning experiences and society in all national schools by introducing smart classes and SLEs. In general, the emphasis and advances of smart education have become a recent phenomenon in the field of education. His Highness Sheik Mohammad bin Bin Rashid Al Maktoum, vice-president of Dubai and premier and governor, began the Dubai School Education Program in 2000 for Dubai city, and the UAE list of education priorities included digital technology as the main priority. Mohammad Bin Rashid Al Maktoum Secondary School was the first school to carry on this program, preceded subsequently by the schools of Abu Dhabi in an ambitious strategy to disseminate the learning to all schools around the world (Magisterium of Education, 2013). Unfortunately, it was however discovered by Kapiszewski (2017) that not so many Middle East countries are active in the usage of ICT in public schools (M Asaseh, 2014).

Since 2000, the UAE Department of Education has adopted online learning in Dubai in order to provide opportunities to shy and marginalized pupils. Students who were hesitant to raise their hands in class were exposed to virtual learning, which allowed them to send teachers messages privately or through a classroom utilizing an instant messaging network to submit their questions electronically (O'Sullivan, 2016). However, there are a number of issues that constitute a threat to the educational sector in the UAE. For example, many teachers are unable or unable to participate in teaching

training that would improve their ability to carry out their obligations as teachers. This has a significant impact on both teacher and student performance as well as students in UAE Abu Dhabi Education Council (ADEC, 2015).

Traditional methods of life, which included daily life habits, were modified and driven by internet technology during the COVID-19 pandemic, when physical contact between humans was restricted to prevent the virus from spreading. This was referred to as the New Normal. To generate, exchange, and enable the use of knowledge with the least amount of human-physical engagement, a smart learning environment was established. The IoT concept is used as a very big umbrella for covering various aspects through the internet network, in which digital and physical entities can be linked and communicated. The technological devices used varied in size, computation power, energy capacity, and storage capability, so the IoT concept is used as a very big umbrella for covering various aspects through the internet network, in which digital and physical entities can be linked and communicated (Siddiqui et al. 2019; Martino et al. 2018; Dong et al. 2017; Li et al. 2015; ITU-T, 2012; Miorandi et al. 2012).

While steering the Dubai schools COVID shut down, the UAE Ministry of Education e-learning initiatives was responsive and by then the proliferation of online learning in Dubai facilitated academic continuity as well as allowed for a smooth transition in a severely compressed time frame. Simultaneously, the KHDA also launched its remote learning platform to support Dubai's distance education shift, through which private organizations provided free apps, websites, services and other resources to parents, students, and educators (Cavendish Maxwell, 2020). Behavioral intention is therefore observed from the fact that companies and educational institution

are keen to incorporate E-learning technology into their current practices as a source of learning so that target people and/or employees can be educated using the most updated information. As virtual learning is becoming more prevalence in the education institutions, the necessity to study students' adoption of these virtual tools becomes a vital factor in its successful application. Significance of user acceptance behavior can be understood through different techniques. During the early advent, the end-users like students use the technologies for normal purpose of studying. Such decision via which their learning behaviour is affected or influenced should be taken as their readiness to embrace change. From this concept, the empiric evidence has found that technology acceptance designed with end-users are more effective as compared to the technology acceptance where no end-users were involved.

The enhancement of student quality education was related the growing number of schools in the UAE which were adopting e-learning platforms (Khaleej, 2020). As a result, e-learning platforms have become popular over the years for academic institutions who have resorted to adopting the education delivery and management tools. SLEs through the above tools are witnessed from a broader perspective as having the capacity to let students learn beyond what is taught in a classroom and be able to engage their peers and teachers online.

SLEs were being used in assigning tasks, setting collaborative learning experiences, sharing learning resources, collecting and marking student work as well as supporting game-based learning. The GEMS Wellington Academy in Silicon Oasis for instance agreed to have been using several virtual learning, environment platforms, such as Fusion and Pamoja (Helen B., 2020). Such adoptions by different institutions

is an image of the teaching and learning lead practitioner in the UAE schools. The advantages of such modernity included uploading work for teachers and share learning experiences through online forums, enabling access the resources and tasks for each lesson as well as accessing home learning assignments.

Also, global efforts towards quality in education target all educational levels to sustain the social and economic development of nations (Mohammad, 2017). In the Gulf region for example where UAE is located, education has been experiencing rapid and continuous developments although with some stagnation due to internal and external factors (Galil, 2014). To successfully implement UAE education developments, engagement of administration and management bodies is key: Table 1.1 below is an illustration of UAE education administrative bodies.

Table 1.1
Chronicle of Administration and Management of the UAE Education

Administration/ Management	**Year**	**Responsibilities**
Ministry of Education (MOE)	1976	• Responsible for primary, middle, and secondary education. • Eradicates illiteracy. • Oversees all Emirates-based educational councils and authorities.
The Commission of Academic Accreditation (CAA)		• Estimating the quality assurance of all educational institutions under the Ministry of Higher Education. • Issuing licenses for qualified educational agencies.
The National Admission and Placement Office (NAPO)	1996	• Facilitating and improving the flow from secondary education to higher education. • Preparing the Common Educational Proficiency Assessment (CEPA) test. • Processing the scholarships for the qualified students.

(continue)

Table 1.1 *(continued)*

Abu Dhabi Education Council (ADEC)	2005	• Developing and implementing innovative educational policies such as smart education. • In 2009, all teachers were transferred to work under ADEC. • From 2010, ADEC became responsible for education in Abu Dhabi concerning financial and administration.
The Knowledge and Human Development Authority (KHDA)	2006	• Developing all human and knowledge resource sectors in Dubai. • Improving quality, accessibility, and engagement in education. • Overseeing performance in all learning sectors. • Issuing licenses to private schools. • Supervising training centers.
The National Institution for Vocational Education (NIVE)	2006	• Providing services for students to get jobs. • Overseeing vocational education. • Benchmarking against well-known international vocational agencies
MOE's organizations	2010	• Education for all Emiratis. • Developing educational plans. • Preparing curriculum and exams. • Monitoring performance of all under the MOE's authority.

To reform and modernize the education in Abu Dhabi, ADEC decided to bring thousands of highly professional teachers and employ them at all levels of the educational system. The ADEC activities were not limited to the office hours but extended to after-hour activities by providing a program contracted with Brazil that started in 2008; the program extended to have 42 schools under the supervision of 81 Brazilian coaches (ADEC, 2017). The rules set by ADEC were applied to teachers by defining their duties which included using student-centered approaches and continual assessment to achieve all learning outcomes. The resources of the smart education were

prepared and electronic devices were ready for use (ADEC, 2015) thus relating to equipping a smart learning environment.

The capacities of Smart Educational System teachers (SESTs) and school management information systems (MISs) were moderately positive, according to the study (Sugunah, 2014). The CPD, according to the same author, would focus on understanding the essential features of smart education programs in schools. However, without proper execution, the course aim will not be met. And having a well-thought-out strategy was critical. However, while teachers were thought to have wired teaching skills, structured phonetic instruction, and fluency, Juan et al. (2016) suggested that combining vocabulary and comprehension techniques in virtual classroom training would have a more positive impact on both pre-service and in-service teacher views.

Additionally, a pleasant SLE aids the current digital age which reflects how advanced technologies enable learners to digest knowledge and skills more efficiently, effectively and conveniently. On the other hand, behavioral intention is understood as an individual's readiness to perform in a given behavior summarized as 'attitude'. In a smart learning environment, the collaboration of struggling learners (students), motivators (teachers), methods, content and tools constitute the ecosystem of smart learning (Spector, 2014). Garcia-Cabot et al (2015) presented access to materials and exercises from portable devices as one of the key challenges for e-learning. Therefore, to eliminate barriers above and enhance education efficiency, personalized learning environments and innovative technologies needed to be created that enable digital material to be customized and tailored to digital devices (Klašnja-Mili, et al, 2017). Similarly, the transition from traditional to virtual learning education system confronts

challenges of information and communication technologies (ICT) and operational risks which primarily preclude the efficient use of eLearning systems. In the higher education system, faculty experience in eLearning, opposition to change, and quality of the Learning Management System (LMS) are the core sources of operational risks (A. Syed, Shabir A. & Waleedi Rafi, 2021)

According to Collins (2019) Information and Communication Technology (ICT) was pronounced by the UAE government as being fundamental in modernizing the overall country establishments especially the education. The ruling has fuelled establishing policies and regulations, improving the ICTs, enhancing citizens' capital, encouraging research, and developing new technologies (ADEC, 2017). The concept combines all different aspects for effective connection, this is because there exists many different and complex factor in IoT architecture. Also, many protocols, services, and technologies are provided to support IoT concepts, such as NFC, LoRaWAN, Cellular, WiFi, Zigbee, Z-Wave, and Bluetooth (Savjani, 2019; Triantafyllou et al. 2018).

Thus, with a lot going on in the sector, making learning systems smart has been the objective of many researchers both in fields of computer science and education. Since the early 1980s, scholars have developed intelligent tutoring systems (ITSs) that integrate artificial intelligence techniques in educational applications (Van Seters et al. (2012). The objective of designing ITSs was to help individual student to learn by adapting the learning interfaces or materials based on needs, along with the popularity of computer networks and the World Wide Web, many learning systems have been implemented in form of web-based learning systems (Walsh, 2019 & Wayne H., 2019).

The concept of smart learning began in Dubai, the year 2012 and then spread to other cities in UAE thus leading to the birth of smart learning environments where technology adoption has been evolving rapidly due to immense desire to catch up with global competition and development. Actually, basing on the records of Alhebsi et al.(2015), the Ministry of Education (MoE) in the United Arab Emirates (UAE) took this duty with a target of sheltering all schools with smart learning by the year 2020 under UAE Vision 2022. Excitingly, the traditional blackboards and paper textbooks were no longer needed, instead smart boards have been provided with personal computers (PCs) run by a 4G-high-speed network, also equipment was provided to both learners and teachers (Siddiqui & Masud, 2012). The outcome and evaluation of implementing smart learning has been discussed by several researchers as; increased student engagement, better achievement, and severe reduction in disciplinary cases (Zhu et al., 2016). Furthermore, it was also shown that implementing smart learning smoothly caused learner-centered education (Hwang, 2014)) hence the need to review smart learning environments for sustainable triumph in the smart learning system.

Joseph et al. (2013) additionally recorded the six factors for effective implementation of a smart learning environment as; institutional body (administration students' services, and academic issues), technology and information management, third was pedagogy. Also social, political, and geographical factors played an important role in determining the depth of applying "e-learning". The fifth category was related to resource support, which determines the type and the depth of the support (El-Gamal & Abd El-Aziz, 2011) and the system evolution. Even with such tremendous effort, the technology to be implemented in a smart learning environment comes with high costs, complex teaching methodology, unreliable developers, low skilled professionals,

monitoring gaps etc. (Evans, 2016). Many researchers have not satisfactorily answered the question of learner's attitude and smart learning environments, even the mediating effect of perceived ease of use (PEOU), perceived Usefulness (PU) on smart learning environment and behavioral intention have not been clearly studied.

Conceptually, smart learning environments encompass "intelligent tutoring systems (ITSs)", "adaptive learning systems", "technology-enhanced learning", "web-based learning", "mobile learning", "context-aware ubiquitous learning using sensing technologies". An adaptive learning system is developed for supporting students to probe and acquire knowledge based on their learning status and personal factors, such as learning progress, knowledge levels, learning styles, cognitive styles and preferences (Mampadi, Ghinea, 2011). Behavioral Intention is seen form one's perceived possibility or individual likelihood to engage the specified behavior, reorganizing perceived ability to perform a particular behavior to achieve a certain goal determines whether behavior actually occurs. Cheng (2019) describes the acceptance to use technology as a result of perceived; enjoyment, expectancy, trust, performance-self efficacy and risk moderators among users

Theoretically the two primary factors in borrowed in support of the Technology Acceptance Model (TAM) while guiding this research included both the perceived ease of use and perceived usefulness (Hilles, 2017 & Alaa.M. 2017). For example, a student who perceived virtual classroom as too difficult to join and complex to participate in was unlikely to want to adopt the e-learning technology, while another older student who perceived virtual learning as providing needed mental stimulation and as easy to learn would be more likely to want to learn how to study online. Whereas the

Technology Acceptance Model (TAM) has been criticized on a number of grounds, Braun (2013) said that the theory serves as a useful general framework due to its consistency with a number of investigations into fundamentally influential factors. Furthermore, Amornkitpinyo (2014) in looking at the causal relationship between technology acceptance and students determined that perceived usefulness (PU) and perceived ease of use (PEoU) significantly mediated student intentions with other variables (IV and DV) thus a motivation for this investigation.

In addition, the Theory of Planned Behavior (TPB) presented the critical feature as behavioral intent, in which the learner's behaviors were influenced by their individual attitude toward the likelihood that the behavior will have the expected outcome, as well as their personal assessment of the risks and benefits of that outcome. TPB began in 1980 as the Theory of Reasoned Action, with the goal of predicting an individual's intention to engage in a behavior at a certain time and location. It now aims to characterize and explain all behaviors over which humans have self-control.

According to this study, the above two theories were employed to predict and explain a wide range of effects of the Smart learning environment on student’s behaviors and intentions. The TPB (Theory of Planned Behavior) states that behavioral achievement depends on both motivation (intention) and ability (behavioral control). It distinguishes between three types of beliefs - behavioral, normative, and control hence fundamentally influential in this research.

The current study gave priority to investigating the effect of a smart learning environment (SLEs) on behavioral intention of secondary school learners

(BI/IUSL)) in UAE, plus the relevance of the variables on UAE business and managerial area, it considered perceived usefulness (PU) and perceived ease of use (PEOU) as mediators. Examining the attitude of users towards the intention to use smart learning (IUSL) was crucial just like explaining the influence of smart learning environment on the economic world and management evidence was collected from secondary schools. It was concluded that Perceived ease of use had a strongly significant mediation effect on the independent variable and dependent variable, unlike perceived usefulness whose effect was not significant in this case. This research can be looked at as a panacea to implementation procedures and other concerns as earlier introduced in smart learning environments.

1.3 Problem Statement

Conventional learning theory argues the importance of the learning environment, well designed Learning environments can combine traditional methods with technological innovation to improve the accessibility and efficiency of educational systems(Cheung et al., 2021) . Integrate technology into education such as online courses can enhance the learning experience Combined with traditional methods of interaction. Online or hybrid learning environments create potential learning spaces for students to use technology for effective teaching and learning(Cheung et al., 2021). Also, E learning refers to the transition from the traditional teaching and learning system to the use of technologically powered resources. However, stated that E-learning should not be regarded as a replacement for traditional learning, but rather as a platform for promoting and improving the learning environment.((Jameel et al., 2020).

Smart Learning Environment (SLE) is a technological innovation that can create a whole new learning environment for optimization Learner's ability to learn. SLE It is essentially an adaptive system that improves and evaluates learning experiences based on learning characteristics, preferences and progress (Shukla et al., 2020). Provide engagement, access to knowledge, feedback, and guidance, and leverage rich media Seamless access to relevant information, real and mobile mentoring Using technology to continuously improve the learning environment.(Cheung et al., 2021)

SL implementations are highly dependent on the user's decision to use the technology.(Cheung et al., 2021) and This is expressed as behavioral intention is based on evidenced by previous studies, that people's/students behavioral intention to act or refrain from acting may be the strongest predictor of a specific action. (Jameel et al., 2020).

Jameel et al (2020) argued that behavioral intentions are determinants of actual behavior. Previous research has focused on factors that lead to intent to use rather than actual use.

Despite this, the majority of previous findings agreed that behavioral intention and technology acceptance had a significant impact on smart learning adoption . According to the findings of these studies, smart learning technology was not only a technical solution, but was frequently influenced by behavioral and social context. Jameel et al., 2020).

In SL, the teacher is also a facilitator, where competency is a must and proficiency in using different technological devices helps students learn and use the resources effectively. Also, will motivate students to promote positive attitude and behaviour towards smart learning. ((Shukla et al., 2020).

United Arab Emirates is one of the first countries to adopt smart learning as it is included in its future strategy. In 2012, the Department of Education outlined plans to roll out smart learning tools at the direction of national leaders and ensure they are successfully deployed in classrooms (OECD 2020). The UAE 2021 vision positioned education as a top government priority, launched in 2010 with 15% of the total budget allocated to the Education sector. It is with no doubt that the UAE 2021 Federal budget allocated US$2.8billion to public higher education and university programs.

The United Arab Emirates has made significant efforts in recent years to integrate ICT into schools. This recognizes the importance of developing global competencies and other her 21st century skills and supporting students as they integrate into today's digital world (OECD 2020). Besides providing ICT resources to schools, the UAE has also provided ICT training for teachers and developed digital and online interfaces such as eSIS and the Learning Curve platform (OECD 2020).

Hussain Bin Ibrahim Al Hammadi, Minister of Education, said “The ministry is offering 13 educational platforms on its smart education portal, and has trained 25,000 teachers in the public sector to use smart education tools, along with nearly 9,200 school principals and teachers from private schools. A specialist training course on remote

learning was also held, in cooperation with the Hamdan Bin Mohammed Smart University, for some 67,000 people"'. (*UAE's smart education a game-changer* 2020)

It is evident from TALIS 2018 data that teachers in the UAE are confident and well-prepared users of ICT in the classroom. Teachers in the UAE report using ICT with students more than nearly every other country participating in TALIS. As shown in Figure 4, 77% of lower secondary teachers and 80% of upper secondary teachers say they frequently or always let students use ICT for projects or class work. For lower secondary teachers, only Denmark, New Zealand and Australia have higher percentages of teachers who report frequently or always letting students use ICT for class work (see (OECD, 2019)). "'A slightly lower percentage of UAE primary school teachers (68%) report frequent usage of ICT with their students, but it is still well above the average of 43% for those countries that surveyed their primary school teachers (Figure 4)"' (OECD 2020, p15)

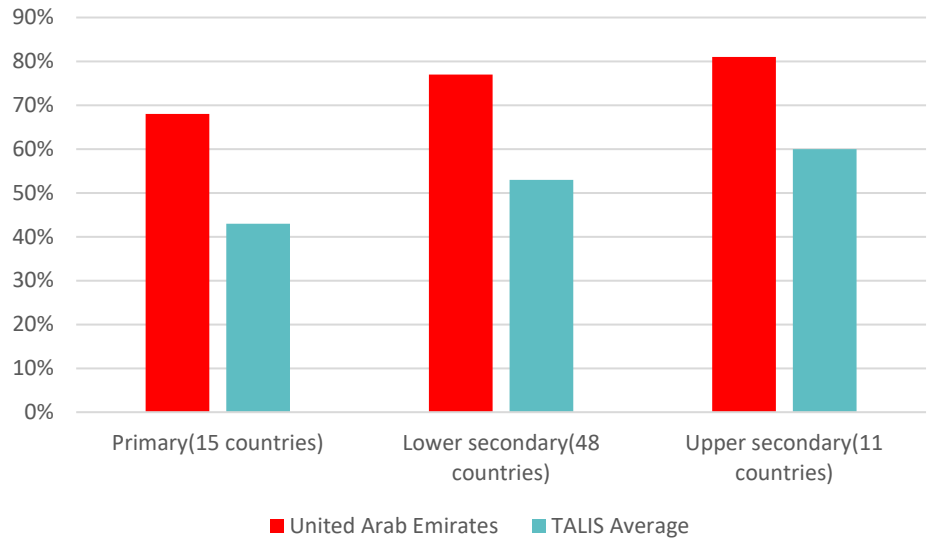

Figure 1.1. Use of ICT in classrooms, TALIS 2018(Source OECD 2020)

Despite this importance), The OECD research shows that the application of ICT is indeed a challenging undertaking. In fact, many education systems and teachers, despite their best efforts, fail to implement them effectively. (OECD 2020).

In addition, students **who used** computers **on** all or **almost** all of their **lessons their PISA score was slightly lower than that of students who did not use computers frequently.** Additionally, the use of technology did not seem to help bridge the skills gap. Despite countries providing equitable access to computers, disadvantaged students are still hampered by a lack of "'traditional educational skills" (OECD 2020).

Therefore there is a need to investigate the factors that impact student behaviour intention towards adoption the smart learning, especially that smart learning environments surface with miserable experiences that decelerate smart learning projects as well as learning initiatives (Frimpon, 2017).

Intentions to use SLEs has faced fear emotions on technology adoption by teachers and students during the COVID-19 pandemic (Al-Hamad, 2021), teachers in the UAE were not competent enough to contribute to the 4IR (Al Shamsi, 2021). Even though education institutions have increased smart learning usage, learner's acceptance, interest and intentions are not suitably positive as anticipated (Chavoshi, 2018; Kim et al., 2017). This is due to several factors which have hindered student's acceptance and behavioural intention towards smart learning. Examining such factors in a diversified and consolidated approach was fundamental (Briz-Ponce et al., 2017; Nikou & Economides, 2017).

There is also no framework to predict behavioural intention to use smart learning in the UAE education sector (Ahmed, 2020), yet the existing physical separation measures and pre-existing digital and social barriers robbed the most marginalized groups of the opportunity to continue learning, putting them at risk of falling farther behind. The proposed innovative model of Pedro (2021) has failed to address key challenges of intentions to use smart learning in the United Arab Emirates (March 2020), the government has implemented a number of new practices to ensure that all sectors continue to perform well (Iman & Nizar, 2021).

Demotivation among learners and teachers was caused by a lack of operational distance-learning and educational resources, disruptions to assessment and certification, and a general decline in the quality of training, which, when combined with rising economic hardship, increased the likelihood of failure. Much as learners' acceptance determines the effectiveness of smart learning, perceived usefulness and perceived ease of use are significantly influenced by capability (Al-Bashayreh, 2022). Researchers like Kim (2017), Molenaaret al. 2020; Siemens 2019) have not explained the most applicable methodology in understanding smart learning technologies.

Although Nasser (2021) claimed that Ease to use and usefulness are strong factors to be investigated in technology adoption studies. There is a lack of a well-documented study investigating students' experiences in terms of usability, challenges, and factors influencing satisfaction to inform a decision regarding future implementation (Gambo, 2022). The behavioural intention of learners still illustrate slow adoption of the smart learning technologies, PEOU is still very low in most UAE students especially the poor local learners who seem to be naive, and worst of all they

perceive the Smart learning environment as stressors instead of being helpful(MoE Report, 2018). More existing challenges in the unimproved smart learning environment have elevated stress levels, pressure and unrealistic failure in students thus affecting the invisible human aspect and yielding negatively in the UAE behavioral intention. The UAE situation seems to be unchanged even though Alhebsi et al. (2015) reported that the MoE intended to cover all schools. Sadly, the exacerbated challenges related to coordination between ICT infrastructure, school support, human capacity, teacher's attitudes, and learner's readiness reported by Mulwa & Kyalo (2013) indicate the broadened gap in creating a model which could cater for education institutions. The Education sector and related departments worldwide drew attention to STEM (Science, Technology, Engineering, Math), with reflection on effect of workforce changes on education. Othman, 2012; Taha (2013) presented the most often referred to as the "4C's" (critical thinking, communication skills, collaboration, and creativity) where a survey of US executives showed 75 % who responded that these skills would become more important. More, Employers indicated the growing need for applicants who have mastered 21st Century skills. Many researchers have tried to address the subject of enhancing smart learning implementation but leaving UAE secondary schools with deficiency in studies related to the current context. Dawson et al. (2019) & Andres et al. (2018) thought that the Technology Acceptance Model (TAM) still fails to clearly align smart learning Environment with the psychological outcome and the expected negative effects like the digital divide mainly with minority language groups, students with visual and tactile modalities and the poor. Such limited empirical research hinders the development of a conceptual framework that examines the behavioral intentions in UAE education sector, therefore a call for synthesised

investigations on intention- behavior relations to address questions on the intention-behaviour gap in the usage of smart learning within UAE education institutions.

1.4 Research Questions

The study was guided by the research questions below which sought to address existing the research problem and topic under study:

1. Does Smart Learning Environment (SLE) affect behavioural intention (IUSL) among learners in UAE Secondary schools?
2. Does a smart learning environment (SLE) affect perceived usefulness (PU)?
3. Does Perceived Usefulness (PU) affect Behavioural Intention (IUSL)?
4. Does Smart Learning Environment (SLE) affect perceived ease of use (PEOU)?
5. Does perceived ease of use PEOU affect Behavioral Intention (IUSL)?
6. Does perceived usefulness (PU) mediate the relationship between Smart Learning Environment (SE) and Behavioural Intention (IUSL)?
7. Does perceived ease of use (PEOU) mediate the relationship between Smart Learning Environment (SLE) and Behavioural Intention (IUSL)?

1.5 Research Objectives

General research objective is to investigate the effect of Smart learning environment, perceived usefulness, perceived ease of use and behavioural intention to use Smart Learning in UAE Education Sector

The Specific research objectives are:

1. To examine the effect of Smart Learning Environment (SLE) on Behavioural Intention (IUSL) among learners in UAE Secondary schools.
2. To investigate the effect of smart learning environment (SLE) on perceived usefulness (PU) among learners in UAE Secondary schools.
3. To investigate the effect of Perceived Usefulness (PU)on Behavioural Intention (IUSL) among learners in UAE Secondary schools
4. To examine the relationship between Smart Learning Environment (SLE) on perceived ease of use (PEOU) among learners in UAE Secondary schools.
5. To examine the effect perceived ease of use PEOU and Behavioral Intention (IUSL) among learners in UAE Secondary schools
6. To investigate whether perceived usefulness (PU) mediates the relationship between smart learning environment (SLE) and behavioural intention (IUSL).
7. To investigate whether perceived ease of use (PEOU) mediates the relationship between Smart Learning Environment (SLE) and behavioral intention (IUSL).

1.6 Research Hypothesis

The hypotheses used to test the relationships in the conceptual framework shown in the preceding section are:

H1: Smart Learning environment (SLE) has a significant effect with behavioral intentions towards usage of smart learning.

H2: Smart learning environment (SLE) has a significant effect with perceived usefulness (PU) towards usage of smart learning.

H3: Smart environment (SLE) has a significant effect of perceived ease of use (PEOU) towards usage of smart learning.

H4: Perceived usefulness (PU) has a significant effect on behavioral intention (IUSL).

H5: Perceived ease of use (PEOU) has a significant effect with behavioral intention (IUSL).

H6: Perceived Usefulness (PU) mediates the relationship between smart learning environment (SLE) and behavioral intention (IUSL).

H7: Perceived ease of use (PEOU) mediates the relationship between smart learning environment (SLE) and behavioral intention (IUSL).

1.7 Conceptual framework

This conceptual framework illustrates the relationship between Smart learning environment (SLE) and behavioral intention (IUSL), directly and through the mediating effect of perceived usefulness (PU), and perceived ease of use (PEOU).

Smart learning environments are composed of adaptive learning systems, technology-enhanced learning methods, web-based learning, mobile- learning, and content under study, teachers and learners. Chen (2016) gave his view that the learning progress, knowledge levels, learning styles, cognitive styles and preferences determine a lot in the process of SLE yet they are completely defining the learning status and personal factors. Students in a smart learning environment have relative experience with intelligent learning environment (ILE) where education soft wares engage students in solving contemporary problems with the support of conceptualized censored technologies.

The independent variable in the framework is smart learning environment (SLE), which is a second-order construct that comprises 4 first-order constructs: smart technology, environment, content control, and group interaction (Zhu et al., 2016). The dependent variable is behavioral intention (IUSL) of smart learning. In between there are two mediating variables (perceived usefulness-PU, and perceived ease of use-PEOU), which are assumed to mediate the relationships between the IV and DV. The research framework is shown in figure 1.1 below.

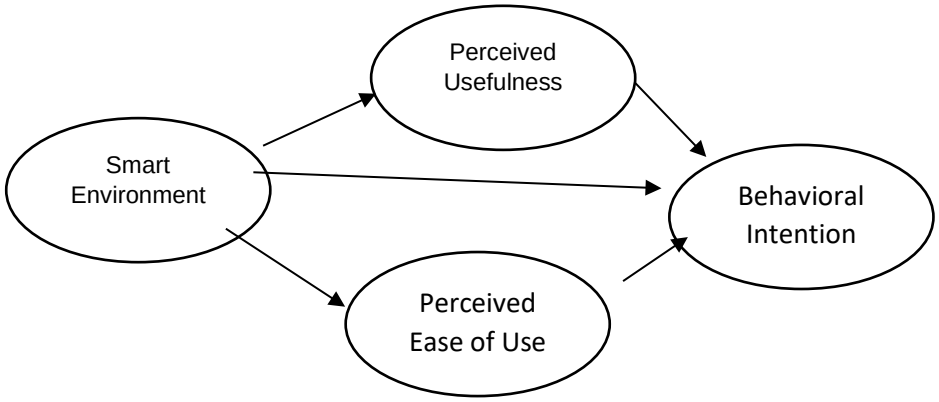

Figure 1.2. Proposed Research Framework

1.7.1 Smart Learning Environments (SLEs)

Traditional learning frameworks (TLFs) have been chastised for being excessively artificial, rigid, and unresponsive to today's needs (Graf et al., 2012). Due to continual breakthroughs in ICT and the rise of new pedagogies throughout the digital age, the use of technology to facilitate studying has become a global phenomenon. Information and communication technology, educational outcomes, and institutional component were defined and enhanced by Tikhomirov (2015). A SLE, in particular, has space-time, technology, control, and interaction; it is technically and pedagogically viable to construct novel learning environments. Devices can interact and communicate without the need for human interaction, and they can make judgments based on a sequence of Zhu et al (2016).

In SLEs learner-centered aspects, smart technologies engaged and increased independence of learners in open and more connected ways (Middleton, 2015). Smart learning environment repeatedly considers four major parts which include; Smart

technology, environment, control and group interaction which were treasured components of a smart learning environment. Merril (2013) considered an SLE as a generally effective, efficient and engaging interface where a learner was at the heart of smart learning where self-learning, self-motivation and personalized services were accessed.

Students are currently engrossed in the use of smart mobile devices and internet resources for everyday communications, learning, and pleasure (Chanel M. Sutherland, 2016). Siemens (2013) advocates for the use of data analysis to forecast future student performance as well as to solve problems that may arise (Zhu et al., 2016). SLEs provide a broader picture of students' actions, as well as the ability for tutors and teachers to deliver instructional feedback to students via virtualized learning dashboards powered by learning analytics. Visualizations for learners and teachers connect them to their classmates or other people involved in the learning process (Duval, 2011). Ajay (2020) appreciated the existence of numerous technological aspects and types that were employed to promote and enhance learning, including both hardware and software. The hardware consists of commonly used tangible objects such as interactive whiteboards, smart tables, e-bags, mobile phones, wearable devices, other smart devices, sensors that use ubiquitous computing, cloud computing, and ambient intelligence, and sensors that use ubiquitous computing, cloud computing, and ambient intelligence.

The use of smart learning environments has got strengths over the traditional physical classes, for instance; smart learning environment promote faster learning skills, they are environmentally friendly, they grant equal membership to both learners

and teachers, the approach greatly supports teacher's ability to track academic power of individual learners thus promote academic achievement, the use of games, placards, puzzles stimulate brain cells especially in growing students, they ate time saving environments, the availability of free online academic resources is also a key importance. Drone (2018) cherished the capacity of SLEs to compensate for physical class related problems, this was because he agreed that such environments have motivating conditions, creative and independent traits which would encourage many users to actively get involved in managing operating situation. Also Salaria (2021) thought Smart learning environments gave learners quality experiences with a variety of tools like projectors, amplifiers, microphones, internets access, computers etc. The author called up on learning institutions to evolve to march basic smart classes (BSCs), advanced smart classes (ASCs) and intermediate smart classes (ISCs)

1.7.2 Perceived Usefulness

Perceived usefulness (PU) can be understood as the extent to which various individuals believe that using a technology/service highly enriched performance in an organization or any functional environment, this greatly increases when the users perceive reliable benefits from using a technology. Considering the TAM model, perceived usefulness is a crucial construct (Mamoun, 2017). Moreover, perceived usefulness plays an important role in influencing behavioral decisions of technology users (Hajli, 2014), and would also expect to have a positive association with the attitude of users towards a technology. This study refers to perceived usefulness as the degree to which SL environments can be seen as of benefit by the learners.

1.7.3 Perceived Ease of Use

Perceived ease of use (PEOU) reflects the degree to which different users believe that the system or technology is easy for them to use (Wahyu, 2020), the higher the degree of perceiving ease in adopting the technology, the more likely users/learners will adopt the smart learning environment. In the context of smart learning technologies, PEOU reflects the level to which the user feels that usage of such technology is easy to use. perceived ease of use is an important intermediary variable, which has a direct positive impact on use attitude.

Perceived ease of use is an important intermediary variable, which has a direct positive impact on use attitude. From the relationship of latent variables, perceived ease of use is the intermediary variable between service quality and perceived usefulness; perceived ease of use is the intermediary variable between information quality and perceived usefulness; perceived ease of use is the intermediary variable between service quality and use attitude; perceived ease of use is the intermediary variable between information quality and use attitude; and perceived ease of use affects perceived usefulness; only perceived ease of use has a direct positive impact on use attitude. From the perspective of technology acceptance psychology, simplicity and ease of use are the basis for the rapid acceptance of new technologies. With the same use effect, the simpler the product is, the more positive the user's attitude is, and the easier the product is to be accepted. Perceived ease of use plays a significant role in the prediction of perceived usefulness and use attitude. Therefore, we should pay attention to students' awareness of the ease of use of the network platform, so as to enhance students'

recognition of the role of the platform and correct students' attitude towards the use of the platform (Feng, 2022)

1.7.4 Behavioural Intention towards Usage (IUSL)

Hafiez (2020) describes behavioral intention as the disposition of technology users regarding usage of the technology. Hence, IUSL will reflect the desire of the users to apply the smart learning systems in their learning process. The TAM model has been widely used in technology acceptance research to investigate behavioral attitude in various contexts.

Implementing a smart learning environment has got different concepts; however, it is not deviating from the principal goal of creating intelligent environments in order to facilitate new pedagogical methodology for teaching the new generation (Zhu & He, 2012). The current study will apply behaviour intention to mean the real attitude or exact attempt of learners to use SLEs, there are various attempts to propose a robust conceptual framework for implementing smart learning keeping in mind the challenges, success factors, etc., as depicted in the table below.

1.8 Operational definitions

1.8.1 Smart Learning Environment

Spector (2014, p. 2) considers that a smart learning environment is one that is "effective, efficient and engaging". Moreover, the present authors consider that it is important to support the fusion of technology and pedagogy to create a coherent ecosystem that provides "real-time and ongoing evidence of changes in knowledge, instilling skills which are seamlessly transferred to learners as they move from one learning context to another" (Chen et al. 2016A smart learning environment not only enables learners to access digital resources and interact with learning systems in any place and at any time, it also actively provides the necessary learning guidance, hints, supportive tools or learning suggestions in the right place, at the right time and in the right form reviewed literature suggested that Smart Learning Environment (SLE) was a multi-dimensional construct with four components: smart technologies (ST) like Virtual classrooms, e-books, and smart classrooms, learning analytics and smart class rooms yet environment (E) composed of intelligent tutoring systems, adaptive hypermedia, learning analytic systems, learner and knowledge centred. Ccontrol (C) is seen from personalized content, schedules work, flexible, self-assessment, solicited feedback. Group interaction (GI) expressed through learner instructor interaction, discussions, learner content interaction, peer interaction and virtual projects. This study looks at SLE as the visible and invisible surrounding in smart education undertaking. SLE is a place or space that describes student features to help them utilize the best suitable instruments

and resources by using data recording and automated appraisal of the whole process to promote effective and efficient learning (Wang S., Yang J., 2021).

1.8.2 Behavioural intention

This refers to the motivating components that affect a certain behavior, with the stronger the intention to perform the behavior, the more likely it will be performed (Fakhrudin et al 2018). The willingness of users to try new technologies (Davis, 2020). The UTAUT2 model assumes that BI can be directly influenced by effort expectancy, performance expectancy, facilitating conditions, social influence, hedonic motivation, habit and price value (Venkatesh et al., 2019). Recent empirical research has substantiated UTAUT2 factors' predictability of college students' BI of LMS (Abbad, 2021; Chen et al., 2021; Kumar & Bervell, 2019; Yunus et al., 2021). This refers to the motivational factors that influence a given behavior where the stronger the intention to perform the behavior, the more likely the behavior will be performed, Behavioural intention, in turn, is predicted one's affective and instrumental evaluations of performing the behaviour: one's perceived social pressure to perform a behaviour or not and perceived behavioural control (PBC). This research looks at environmental factors and primary determinants of learner's behavior towards the use of smart learning environments, this behavior can be positive, negative or neutral depending on the user's perception.

1.8.3 Perceived Usefulness

Perceived usefulness assesses the prospective users' opinion on the usefulness and effectiveness of smart learning in improving academic performance, it thus inspires potential users of ICT tools to accept innovative and technologies that are useful (Li et al., 2018). TAM claims, TAM claims, PU directly influences behavioural intention, and users identify the usefulness of a particular technology and subsequently, formulate a positive intention of using it. The same theory TAM claims that perceived usefulness is influenced by perceived ease of use when users' find technology easy to use, their perception is that the technology is very beneficial. Perceived usefulness has empirically been acknowledged and proven to have a significant positive influence on usage intention; and more specifically, the utilization of smart learning (Tseng, 2018). Consequently, the degree to which an individual perceives how useful a smart learning is, the more optimistic is the intention towards its usage; hence the higher the probability of its utilization by him or her.

In this investigation, perceived usefulness refers to the degree to which students have optimistic or pessimistic evaluation of the role the SLEs would give, it entails the consideration of the outcomes of performing the behavior. Therefore Zhang (2019) explained perceived usefulness as the level at which individuals consider the use of a specific scheme to improve their efficiency This research defines perceived usefulness as the benefit/importance learners attach to the smart learning environments and it's worth in achieving academic goals.

1.8.4 Perceived Ease of Use

Perceived ease of use (PEOU) is the degree to which a user believe that adopting a specific technology will require zero effort. Currently, perceived ease of use relates to the individual user's perception of easiness of using the system associated with the accomplishment of the smart learning usage. Yzer (2012) assumes people's judgment about their capacity to perform was dependent on the extent to which a person believed in individual capacity to perform. In the context of this research, perceived ease of Use refers to the extent which a learner finds him/herself with the swiftness to adopt or use the smart learning technology or the reflecting the extent to which people believe it is simple to use a particular system has a positive attitude which positively affects behavioral intention.

Also the subjective norm is revealed as a major predictor of PEOU and a minor predictor for e-portfolio acceptance among students (Abdullah et al., 2016). Smart learning technology anxiety has a negative influence on a student's PEOU in e-learning environment (Abdullah & Ward, 2016). Once users have self-Efficacy (SE) instead of anxiety, there are high chances that they will adopt the technology (Keikhosrokiani, 2019; Keikhosrokiani et al., 2019). Self-efficacy can influence individuals' behavioural intentions to use smart technologies.

1.9 Significance of the Study

This study is significant in a number of ways as discussed here:

Many academic scholars who have examined the smart learning environment in the recent past recorded that over 80% search results from published activities only referred to tertiary education settings, including higher education, for example in March 2021, a simple search of the keyword, smart learning environment, from Google Scholar and Scopus yielded 1990 and 1773 results respectively. This, kind therefore, proves missing literature specifically concerning SLE in UAE secondary schools of UAE.

The thesis provides an immeasurable contribution mostly to academia and business. The expansion of literature for future scholars is achieved. This is because various reviews revealed unveiled the term smart learning environment to a big extent and how it affected the intentions of users /behavioral intention; it is thus equally essential for future scholars to understand the mediating effect of perceived ease of use and perceived usefulness on BI in a smart learning environment. Gros, (2016) foretold a challenge in designing learning ecosystems for the integration of smart learning. This thesis therefore is a source of recommendations and strategies for the standing challenges of smart learning environments. Consequently, the Ministry of Education and all authorities trying to implement advanced technological applications may need a copy.

All frameworks for SLEs presented previously in chapter 2 will guide digital content development and meeting the ongoing technical, human, and organizational needs for effective ICT application and reliable access. Correspondingly, if teachers are

fully equipped with better professional expansion opportunities, the use of ICT for formative learning will definitely widen income opportunities to service providers.

In the same manner, the research could be useful in assisting school managers and policymakers in driving forth advancements for educational standards through the current research-based initiatives. As a result, improving multiple interaction and customization may greatly improve the user's attitude as well as their desire to demand for smart learning equipment which will resultantly mushroom business.

This empirical study is a guide in assessing the effectiveness and the success of smart learning initiatives where the government is making large investments. It thus bridges the knowledge gap in policy makers, implementers, and other stakeholders within the education sectors of all developing countries

The scholar in this research has gained commendable writing skills and knowledge on the study area.

Although studies dealing with smart classroom or smart learning environments (SLE) are emerging, previous literature has had no specific conceptualization of which elements should be taken into account (Palau R., 2019). The current study consequently fixed the literature gaps by coming up with a smart learning (SL) implementation model which specifies key components of a smart learning environment (SLE) for all practicing institutions.

Finally, much as Spector (2014) and Koper (2014) endeavoured to conceptualize SLE in theoretical fields, their approaches are considerably different. Perhaps, there are a few characteristics that can be mined as primary guidelines for the establishment of a Smart learning environment for positive behavior in secondary students thus the need for this research.

1.10 Scope of the study

Conceptually, the study was guided with several basic theoretical considerations (discussed in chapter Two as TAM Technology Acceptance model, TPB- Theory of planned behavior) which helped in providing a better conceptualization of Smart Learning environment (SLE) and behavioral intention (IUSL), especially in developing countries. Such approaches assisted in covering the three major study variables: Smart learning environment as an independent variable (IV), behavioral intention as the dependent variable (DV), although perceived usefulness and perceived ease of use worked as the mediating variables between the relationship of IV and DV.

The proposed Conceptual model was incorporated and intensively studied for insights based on quantitative information collected and analyzed; also, the hypotheses (H1, H2, H3, H4, H5, H6 and H7) were tested to verify the mediating effect caused by Perceived usefulness (PU) and perceived ease of use (PEoU) on SLE and BI, as well as the direct relationship between Smart learning environment (SLE) and Behavioral Intention (IUSL), hence the relative explanatory power of variables was examined.

Being a distinctive specimen where smart learning environments have been a reality due to the advancing teaching and learning technologies plus the high priority given to smart learning (SL) in the UAE. The study targeted secondary school students, which according to the educational system in UAE, go through three years out of the 12-year introductory education (i.e., grade-10, Grade-11 and Grade-12). The study chose a quantitative research approach where a close ended questionnaire was used to investigate how perceived usefulness and perceived ease of use could mediate the interaction between a smart learning environment and behavior intention.

Geographically, the selected sample for this study was represented by students in high schools where smart learning was applied, and the geographical location of the high schools was in Abu Dhabi, which was the capital of the Federation of UAE. In the beginning, the researcher consulted the pertinent authorities at the MoE (Ministry of Education) in the UAE, to set forth the location of the school, the time for the visit and the permission to conduct interviews, which consequently simplified covering the geographical area of study.

However, much as the research scope was well clarified, the distribution of research samples was strongly a limiting factor during the investigation, but the application of random sampling techniques helped to generalize the results and this gave the study meaningful confidence. Also, it was key that the original questionnaire was translated to prevent misinterpretation of questions and meaning alteration.

In the same manner, meeting the research scope was extremely broad for the researcher to cover within the allocated period of time, especially amidst the lockdown.

The scholar sought for guidance from both the supervisor and other research experts where he employed self-administered questionnaires which easily boosted data collection in the required time

1.11 Chapter Summary

Chapter one is majorly an introductory chapter of the thesis, it explores the concept of smart learning environment and behavioral intention through giving the research background and the thesis overview, where the research gap in the literature is primarily indicated in both the background and research problem. All research objectives, research questions and research hypotheses are mentioned at earliest. The conceptual frame work and theoretical framework were also well indicated and discussed in same chapter to communicate every single the study variable to be investigated. The justification of the study clearly signifies the importance of this research, the research limitations and operation definitions were also handled within chapter 1 thus providing a comprehensive study overview.