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**FACTORS INFLUENCING TEACHERS' BEHAVIORAL INTENTION AND
UTILIZATION OF MADRASATI IN PUBLIC SCHOOLS IN RIYADH, SAUDI
ARABIA**

By

ALHARBI, HAMAD MUAYBID A

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

August 2022

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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August 2022

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Faculty : Educational Studies

Modern-day technology in the Kingdom of Saudi Arabia (KSA) is being continuously provided across schools. The utilization of Madrasati (M) as a learning management system (LMS) among teachers in public schools in Riyadh has recently attracted attention because of its role in improving the quality of the educational system in KSA. However, the key problem is the low acceptance and utilization of M LMS among teachers in KSA, particularly in Riyadh. The satisfactory teacher's behavioral intention (BI) toward accepting and utilizing M LMS technology is still a challenge in Riyadh. There is little or no specific research report on the adoption of M LMS in intermediate and secondary schools in Riyadh. Therefore, this study investigates the factors influencing teachers' BI and the utilization of M LMS in Saudi public schools by employing the survey method based on the quantitative approach. The factors selected to determine teachers' BI on M LMS utilization are performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), attitudes, and competence. The questionnaire copies were distributed to 374 Saudi teachers from different schools using simple random sampling. Various statistical analyses were used to validate the data, including reliability and validity of the instrument, pilot test, data normality, descriptive analysis, structural equation modeling (SEM) using AMOS software, CFA, measurement model, path analysis, and mediation analysis. The results of SEM regarding the influence of BI on PE, EE, SI, FC, attitude, and competence indicated that the PE construct has a positive and statistically significant effect on M LMS utilization. Meanwhile, EE has a positive and significant effect on M LMS. Similarly, the relationships between SI and M LMS utilization, FC and M LMS utilization, as well as competence and M LMS utilization are also significant. The results indicate that the alternative hypotheses were accepted. On the contrary, the relationship between attitude and M LMS utilization is not significant, and the null hypothesis is accepted. The results of the mediating effect showed that PE, SI, FC, and competence have an indirect effect on M LMS utilization through the mediating role of BI. BI is statistically significant and partially mediates the relationship between PE, SI, FC, competence, and M LMS utilization. However, EE and attitude do not affect M LMS

utilization through the BI mediator. The results of the moderation effect of gender on M LMS utilization in Saudi Arabia revealed that the beta value of the male for PE, EE, and SI on M LMS utilization is significant. Moreover, the findings demonstrated that the beta value of females for FC is significant, as opposed to male FC on M LMS utilization, which is not significant. Therefore, gender has a significant moderating role in the relationship between FC and M LMS utilization. In addition, the beta value of males and females for attitude and competence is not significant. Thus, the age factor does not significantly moderate the relationship between these variables and M LMS utilization. The PE, SI, FC, and competence factors significantly influence teachers' BI and M LMS utilization in public schools in Riyadh, KSA. The findings obtained have practical implications for educational systems in Saudi Arabia to promote the use of M LMS among school teachers. Schools should consider the existing BI of teachers before deciding whether the system is going to be utilized or not, particularly in Riyadh. Also, the findings would encourage the successful integration of M LMS into the teaching and learning process in Riyadh.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

**FAKTOR-FAKTOR YANG MEMPENGARUHI NIAT TINGKAH LAKU
GURU DAN PENGGUNAAN MADRASATI DI SEKOLAH AWAM SAUDI DI
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Kerajaan Arab Saudi (KSA) sedang menyediakan teknologi moden secara berterusan di seluruh sekolah. Penggunaan Madrasati (M) sebagai sistem pengurusan pembelajaran (LMS) dalam kalangan guru di sekolah awam di Riyadh sejak kebelakangan ini mendapat perhatian kerana peranannya dalam meningkatkan kualiti sistem pendidikan di KSA. Walau bagaimanapun, masih terdapat masalah utama iaitu penerimaan dan penggunaan M yang rendah dalam kalangan guru-guru di KSA, khususnya di Riyadh. Sikap serta tahap kepuasan (BI) guru terhadap penerimaan dan penggunaan teknologi M masih menjadi suatu cabaran di Riyadh. Terdapat sedikit atau tiada laporan penyelidikan khusus mengenai penggunaan M di sekolah-sekolah pertengahan dan menengah di Riyadh. Oleh itu, kajian ini menyiasat faktor-faktor yang mempengaruhi BI guru dan penggunaan M di sekolah awam Saudi dengan menggunakan kaedah tinjauan berdasarkan pendekatan kuantitatif. Faktor-faktor yang dipilih untuk menentukan BI guru terhadap penggunaan M ialah jangkaan prestasi (PE), jangkaan usaha (EE), pengaruh sosial (SI), keadaan fasilitator (FC), sikap menggunakan M (ATT) dan kecekapan menggunakan M (COM). Set soal selidik telah diedarkan kepada 374 orang guru Saudi dari sekolah yang berbeza menggunakan persampelan rawak mudah. Pelbagai analisis statistik digunakan untuk mengesahkan data, termasuk kebolehpercayaan dan kesahan instrumen, ujian rintis, kenormalan data, analisis deskriptif, pemodelan persamaan struktur (SEM) menggunakan perisian AMOS, CFA, model pengukuran, analisis laluan, dan analisis pengantaraan. Keputusan SEM mengenai pengaruh BI terhadap PE, EE, SI, FC, ATT, dan COM menunjukkan bahawa konstruk PE mempunyai kesan positif dan signifikan secara statistik terhadap penggunaan M. Manakala, EE memberi kesan positif dan signifikan terhadap M. Hubungan antara penggunaan SI dan M, penggunaan FC dan M, serta kecekapan dan penggunaan M juga adalah penting. Keputusan menunjukkan bahawa hipotesis alternatif telah diterima. Hubungan antara ATT dan penggunaan M adalah tidak signifikan, maka hipotesis nol diterima. Keputusan kesan pengantaraan menunjukkan bahawa PE, SI, FC, dan COM mempunyai kesan tidak langsung terhadap penggunaan M melalui peranan pengantara BI. BI adalah signifikan secara statistik dan sebahagiannya menjadi pengantara

hubungan antara PE, SI, FC, COM dan penggunaan M. Walau bagaimanapun, EE dan ATT tidak memberi kesan ke atas penggunaan M melalui pengantara BI. Keputusan kesan penyederhanaan bagi jantina pada penggunaan M di Arab Saudi mendedahkan bahawa nilai beta guru lelaki untuk PE, EE, dan SI pada penggunaan M adalah signifikan. Selain itu, penemuan menunjukkan bahawa nilai beta wanita untuk FC adalah signifikan, berbanding dengan FC lelaki pada penggunaan M, yang tidak signifikan. Oleh itu, jantina mempunyai peranan penyederhana yang signifikan dalam hubungan antara penggunaan FC dan M. Di samping itu, nilai beta bagi lelaki dan perempuan untuk ATT dan COM adalah tidak signifikan. Oleh itu, faktor umur tidak menyederhanakan secara signifikan hubungan antara pembolehubah ini dan penggunaan M. Faktor PE, SI, FC dan COM secara signifikan mempengaruhi penggunaan BI dan M LMS guru di sekolah awam di Riyadh, KSA. Dapatan yang diperolehi mempunyai implikasi yang praktikal terhadap sistem pendidikan di Arab Saudi bagi menggalakkan penggunaan M dalam kalangan guru sekolah. Sekolah harus mempertimbangkan BI sedia ada oleh guru sebelum memutuskan sama ada sistem itu akan digunakan atau tidak, khususnya di Riyadh. Selain itu, penemuan ini akan menggalakkan integrasi M yang berjaya ke dalam proses pengajaran dan pembelajaran di Riyadh

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

AGFI	Adjusted Goodness of Fit
ATT	Attitude to Use M LMS
AVE	Average Variance Extracted
BI	behavioral intention
CFA	Confirmatory factor Analysis
CFI	Comparative Fit Index
COM	Competency to Use M LMS
CR	construct reliability
EDA	Exploratory data analysis
EE	Effort Expectancy
FC	Facilitating Conditions
GFI	Goodness of Fit Index
ICT	information and communications technology
IDT	Innovation Diffusion Theory
IT	Information Technology
KSA	Kingdom of Saudi Arabia
LMS	Learning Management System
LUF	Level of Utilization Frequency
LUV	Level of Utilization Volume
M	Madrasati
MLE	maximum likelihood estimation
MM	Motivation Model
MPCU	PC Usage Modelling
NCeL	National Centre for e-Learning and Distance Learning
NFI	Normed Fit Index
NTP	National Transformation Program
PE	Performance Expectancy
PEU	perceived ease of use
PU	perceived usefulness
RMSEA	Root Mean Square of Error Approximation
SCT	Social Cognitive Theory
SEM	Structural Equation Modeling

SI	Social Influence
TAM	Technology Acceptance Model
TLI	Tucker-Lewis Index
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and Use of Technology



CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The world is progressively becoming a global village where everything is being digitalized. Nowadays, almost everything is computerized, and daily practices have shifted from manual to electronic, from conventional to face-to-face, and from traditional learning to e-learning (Gunasinghe et al., 2019; Hadoussa, 2020). Technology eases vigorous tasks by computerizing manual processes and fully automating them (Ling et al., 2020). The education system is also being influenced by technology; for instance, many schools' admission and registration processes are being carried out electronically. Classroom teaching and learning are now being gradually digitalized and revolutionized to fit and meet the needs of modern society, students, and teachers' modes of thinking and lifestyles (Olugbara et al., 2020). Breakthroughs in global technology have changed education and made teaching and learning easier. Its importance is progressively increasing in the education sector. In this regard, technological advances undoubtedly benefit both teachers and learners (Albaqami, 2019).

Today, technology is integrated into the school curricula, syllabuses, and courses; consequently, teachers and students get accustomed to computers and software applications in schools (Alwahoub et al., 2020). Teachers use the internet and other technological platforms to instruct and evaluate students (McCord, 2018). Technology offers confidence and assurance, apart from easing and improving the teaching and learning processes. Advancement in the education sector could help teachers become conversant with the required knowledge via optimal technology utilization (Woodruff & Heidi Wagner, 2020). Thus, educational technology can support teachers in the classroom by making strenuous and less practical activities possible in fashionable ways in schools. Furthermore, the increasing utilization of educational technology could help students understand the learning content and perform better in the classroom through computerized presentation (Alzahrani & Althaqafi, 2020).

Educational technology has continuously been used in Kingdom of Saudi Arabia (KSA) at all educational stages, from primary school to university (Alahmari & Kyei-Blankson, 2018). Between 2007 and 2019, the Saudi government has made massive investments in the education sector to develop it (Alsaleh, 2019). The government introduced electronic devices to facilitate teaching and provided training for teachers to ensure the effective utilization of information and communications technology (ICT) in education (Al-Sharhan et al., 2020).

As part of the educational technology and ICT initiative, the learning management system (LMS) was adopted in Saudi Arabia through the Ministry of Education (MOE) in 1990 (Aldiab et al., 2019). An LMS is a piece of software or web-based technology that is used to organize, carry out, and evaluate a particular learning activity. Since 2018,

the Saudi government has implemented the LMS in public and private schools across the Kingdom (Aljaber, 2018; Alkinani & Alzahrani, 2021). The LMS represents the zenith of 21st century technology and digital advancement, which is deemed a massive undertaking in the K-12 education system in KSA (Al Ohali et al., 2018). The fundamental purpose of implementing LMS in K-12 public schools is to influence students' lives by learning at their own pace while encouraging peer interaction through the teachers' guide. Prior to the COVID-19 pandemic, the majority of schools did not, however, holistically adopt the LMS system as a cutting-edge teaching and learning strategy (Almaiah et al., 2022).

Madrasati was first introduced in 2020, following the COVID-19 pandemic lockdown in KSA, as part of the LMS (known as M LMS) to encourage delivery of teaching and learning as well as promote technology and e-learning utilization in the Kingdom. The Saudi Arabian Ministry of Education launched the Madrasati platform as the new entry point for distance teaching and learning for all Saudi educational levels, from kindergarten through K-12 (Alroqi, 2021). This M LMS introduction is part of the Ministry of Education goals within the KSA Vision 2030 that focus on bringing significant digital transformation in teaching and learning. M LMS was launched as inclusive of the Future Gate initiative integrated into LMS for all public schools in Saudi Arabia (Masmali, 2020). When M LMS was launched, the morning periods were allocated to intermediate and secondary schools, while the afternoon periods were allocated to primary schools.

1.2 Technology in Education

Technology in education refers to the application of technology in education, including primary and secondary schools, colleges, and universities (Al Ohali et al., 2018; Mustapha et al., 2020). It has also been defined as the practical usage of knowledge in a specific area of endeavour (Selwyn, 2020). The term "technology" is also designated as a collection of practices and procedures. In line with this viewpoint, technology in this study refers to the most recent state of civilisation and knowledge on how to organize resources to produce desired outcomes, solve problems, and meet needs, including practical approaches, abilities, practices, talents, instruments, and raw materials (Cohen et al. 2020). Technology has also been widely described as material and immaterial objects based on intellectual, perceptual, and physical efforts to realise specific values (Hollands & Escueta, 2020). In this context, technology refers to instruments and devices which are not necessarily solid or physical, i.e., virtual technology, software, applications, and educational systems utilized to resolve real-human difficulties and challenges (Sweller, 2020).

To most educators, technology in education signifies the utilization of computers, mainframes, and electronic hardware and software for instructional purposes (Domingo & Garganté, 2016). The term symbolizes both a process and a device that teachers utilize in teaching. The Association for Educational Communications and Technology (AECT) Bloomington mentioned that "technology in education is a complex, integrated process involving people, procedures, ideas, devices, and organizations for analyzing problems

and devising, implementing, evaluating, and managing solutions to these problems, in situations in which learning is purposeful and controlled” (Almutairi, 2020, p. 5).

Hence, technology in education concerns using technology to help students learn about the practices and knowledge associated with technology through teachers’ involvement. Using devices and systems entails the human capacity to shape and transform the world to meet human desires by deploying resources and devices to that effect using skills (Alrashoud, 2020). Technology in education resolves detachment between broad utilization and the lack of knowledge regarding practical modules of technologies in use. Several different technology applications in education are encouraging. These applications vary from utilising technology as an instrument to support the traditional teaching model to completely high-tech piloted tools. Upon this view, numerous students in schools (e.g., Saudi Arabia) have shown improved performance after using technology in classrooms (Cohen et al., 2020). Technology permits learners to learn in a peaceful setting (Nyembezi & Bayaga, 2015; Balaman, 2020). In this sense, learners relate to “classroom knowledge” without interfering with founded measures of technological interaction (Olawale et al., 2020). Studies also found that it enables students to be trained by transforming them from weakness to strength. Technology helps the instructor assess skills reliably and purposefully. It also allows the repetition of integral classroom activities in an orderly manner, as encountered in real life (Domingo & Garganté, 2016). In summary, technology in education supports teaching and learning. It helps optimize learning through digital learning instruments, such as laptops and mobile devices, which increase access to learning materials and activities. It allows learning to occur 24 hours a day, seven days a week. A crucial positive influence of technology in education is that it brings students together via discussion and teamwork, which might never be possible if we had the chance to talk to or assist each other. Technology in education allows students to regulate their own time of learning. Students who need additional time can use more time to work on their assignments and access more supporting materials, while students who need less support can proceed with their learning. Technology in education assists students who need more support at the individual level. Finally, when teachers efficiently integrate technology into classrooms or schools, they assume the roles of mentors, content professionals, and instructors.

1.2.1 Technology Utilization

Technology utilization profoundly influences schools’ survival, especially in today’s technology-reliant world where rapid and frequent technological transformations occur (Olawale et al., 2020; Al-Shehri, 2020). Technology use in the classroom can support students’ understanding of instructions being delivered in the school (Supardi & Hasanah, 2020). For example, audio-visual materials presented through projectors allow the teachers to preview their notes and present learning content more efficiently. Studies have reported that various technologies are utilized to standardize the group of modules or instruction in classrooms. Such technologies provide teachers with simulations, demonstrations, assessments, and class activities to support the teaching process (Alshehri & Cumming, 2020).

Factors influencing technology utilization in education are also associated with teachers' perceptions. The teachers' beliefs, opinions, feelings, and considerations toward technology and their ability with technology have frequently been recognized as the main factors associated with technology utilization (Almutairi et al., 2020). Teachers' attitudes and teaching values or intentions in practice are additional factors that encourage the appropriate utilization of technology in education (Pangaribuan & Wulandari, 2018). The nature of the technology itself also affects its utilization by teachers (Akinrinola et al., 2020). In this regard, some teachers still have incongruous thoughts on the substantial impacts of technology in education (Sweller, 2020), causing them to hesitate to doubt and question technology's educational virtues.

The constantly changing technologies make it difficult for teachers to keep up with state-of-the-art trends in technology (Stella, 2020). At a regular interval, new hardware and software are emerging, and the teachers are finding it difficult and discouraging to continue adopting the strange innovations in technology (Ranellucci et al., 2020). Its volatility also makes the technology less glamorous, appealing, and interesting for most teachers owing to its variability and the constant training it requires to use. For instance, teachers with less time in class cannot spend that time troubleshooting devices or computer systems, which they may or may not be able to resolve. When there is no necessity for technology utilization with reliable support, teachers may choose not to use it in their teaching. Overall, despite the government's support for adopting technology, full technology adoption remains challenging in KSA. Technology utilization still needs to be increased to ensure large-scale adoption and implementation in the country, particularly in Riyadh. This shows that the teacher's role in the complete utilization of technology is very crucial in KSA.

1.2.2 Education and Technology in Riyadh of the KSA

In KSA, education is mandatory for all males and females from the age of seven. There are 30,625 schools across the KSA for both genders. Consistent with KSA culture and religion, the educational system adheres to gender-based schools (Wiseman et al., 2018; Binyamin et al., 2020). Moreover, there are two types of school systems: private and public. In private schools, students pay tuition fees, whereas education is free in public schools. Within the last two decades, education in the KSA has made momentous successes by concentrating on offering educational rights to all individuals, despite challenges posed by geographic locations and population growth (Pavan, 2013). Nowadays, education in the KSA is entering a new phase, focusing on the quality of education by ensuring that students across the nation, particularly in public schools, are well prepared to handle future challenges, including technology, cultural diversity, modernization, and globalization (Alamri, 2019). In line with this, educational technology development in the past decade is more apparent in three school levels in Riyadh, elementary (grades 1 to 6), intermediate (grades 7 to 9), and secondary (grades 10 to 12). The Kingdom can only achieve this by employing 21st-century skills while sustaining the values and codes of Saudi culture. In the continuous effort to develop the education system in KSA, the Ministry of Education launched a critical support project to develop the public education sector in the last decade (Ministry of Education, 2020a). The Ministry of Education has considered integrating technology into teaching and

learning. In collaboration with Intel, it was developed in 2007 and concentrated on integrating all technologies into teaching and learning.

Riyadh is the Kingdom of Saudi Arabia's capital and financial hub. It has a population of 7.5 million and a 95.32% general literacy level, increasing by 7.84% annually (Peterson, 2020). It is the biggest city in the Arabian Peninsula and is counted among the world's fastest-emerging cities in terms of population (Aldubayan, 2020). This implies that Riyadh faces challenges in providing equal education opportunities for the fast-growing population.

Saudi Arabia has a total of 30,625 schools, of which 26,248 (86%) are public and 4,377 (14%) are private. Out of these, 4,115 schools are located in Riyadh (Ministry of Education, 2019). In Riyadh and other KSA regions, primary education up to secondary school is open to every individual and is free. Children can attend kindergarten (pre-school) systems based on parents' preferences. Each child in the KSA must enroll in primary school when they reach six. According to UNESCO, gross enrollment for boys is 99% and 96.3% for girls (Mahgoub, 2020). To be admitted into intermediate education, a student must pass the Grade 6 examination at primary school and get the Elementary Education Certificate. In the meantime, technological instructional structure varies based on the level of education. Many K-12 schools offer diverse curricula and extra-curricular activities to cater to the intellectual and physical needs of their students. Admissions to the best schools in Riyadh appear to have a long queue. Moreover, each school has ratings according to parent appraisals and is ranked below (Alrashoud, 2020). In general, schools in Riyadh are well-equipped and managed to provide children with high-quality education. Subsequently, schools in Riyadh offer excellent K-12 general education and are the foremost educational establishments in KSA.

The adoption of technology through e-learning, such as the Learning Management System (LMS), is increasing in Saudi Arabia's schools to cater to the growing student population (Saudi Arabia Ministry of Education, 2019). ICT use is commonly regarded as the most feasible answer to the present challenges posed by the increasing population in KSA. It could sustain the ever-increasing need for e-learning (Almutairi et al., 2020). A learning management system (LMS) has been defined as a web-based technology that helps design, organize, deliver, and assess a particular learning process (Simanullang & Rajagukguk, 2020). It has also been defined as a technological solution that permits the delivery and management of content and resources to the instructors and students in schools (Al-Sharhan et al., 2020). It has been further described as a platform that helps teachers administer and consolidate instructional materials online and operate online courses (Elfeky et al., 2020). Mirzaei & Shabani Nia, 2020) have also been denoted as a virtual learning environment and a course management system that offer solutions and gains for both the teachers and learners in a more adaptable way (Mirzaei & Shabani Nia, 2020). Consistent with these definitions, this software application has a different feature that allows the learning process and its content to be more accessible and easier to manage. It also helps teachers share the learning resources and manage students' enrolment, record-keeping, and activities (Syaad & Hidayat, 2018; Al-Sharhan et al., 2020). Today, there are many forms of LMS used in Saudi Arabia, where some firms are in charge of privately-owned LMS (Mirzaei, 2020). They can have various advantages and are less complex than the free, open-source LMS.

1.2.3 Madrasati (M) in KSA and its Usage during the COVID-19 Pandemic

The first LMS developed in Saudi Arabia is the Jusur LMS. It was developed in 2011 by the National Centre for e-Learning and Distance Learning (NCeL) in partnership with the Meteor group of companies in Malaysia (Asiri et al., 2012). Jusur LM was initially designed to be used in universities, not for public schools. For this reason, the Ministry of Education launched the Future Gate (FG) initiative to incorporate the LMS system into Saudi Arabia's public schools, which aligned with the Saudi Arabia Vision 2030. The launch made way for a substantial digital transformation in teaching and learning in K-12 education in the KSA. Madrasati is a kingdom-inclusive and large-scale LMS for all the public schools in Saudi Arabia (Al-Ohali et al., 2019; Masmali, 2020). It targets the adoption of LMS infrastructure within the classroom (Al-Ohali et al., 2018) and benefits over 5.9 million students and 500,000 teachers in 25,000 schools throughout the KSA as well as parents, principals, supervisors, and lawmakers (Al-Ohali et al., 2019). Teachers' usage of LMS technology supports students by creating networks across subject areas and choosing the optimal LMS tools for elaborating learning via activities. In this LMS technology, the teacher can also upload coursework, assignments, tasks, projects for the students, tests, requests, and examinations. Teachers can also interact with students and their parents through LMS technology to plan their weekly lesson plans. The LMS technology also allows teachers, students, and school management access to daily and weekly activities of learners' virtual classes (Al-Ohali et al., 2018; Ministry of Education, 2020a).

LMSs have gone through different developmental stages until their present form. The first LMS was FirstClass, introduced in 1990 (Aldiab et al., 2019). It was used to manage teaching and training through students' progress assessments. The LMS concept was more unclear before FirstClass LMS was introduced. Then, Blackboard LLC was introduced in 1997 by Michael Chasen and Matthew Pittinsk (Alkinani & Alzahrani, 2021). It is a course management system that delivers content instruction to students from a central location by allowing students to communicate effectively and allowing teachers to allocate grades. In 1999, Desire2Learn (D2L) was introduced by John Baker (Aldiab et al., 2019), which provides access to virtual learning online. In 2001, Moodle was introduced by Martin Dougiamas. In 2008, Canvas was founded by Josh Coates as a web-based LMS used by schools, educators, and students to access and manage online courses. Furthermore, Edmodo was founded in September 2008 to enable teachers to share content, tests, and tasks and manage communication with students, parents, and associates.

The LMS and Future Gate project, under the Kingdom's vision 2030, are essential to Riyadh schools' progress (Al-Ohali et al., 2019; Masmali, 2020). The Ministry of Education (MOE) Saudi Arabia has unveiled some educational projects to develop the country's education consistent with the Kingdom's vision 2030. The MOE is driving towards digital education via the Future Gate project. The goal is for the students to learn in a new technological environment to provide knowledge and improve scientific results. The 2030 vision encourages the development of teachers' scientific and educational capabilities (Alkinani & Alzahrani, 2021). The Future Gate project is associated with the sustainable objectives of attaining comprehensive, justifiable, and high-quality education

for all segments of the Kingdom to develop the human capital required to achieve sustainable education (Shishah, 2021).

Following COVID-19, the Ministry of Education updated the Future Gate e-learning system and named it Madrasati. This effort is concurrent with the closure of schools and educational institutions around the Kingdom to avoid spreading the COVID-19 virus (Aldossry, 2021). During this period, remote learning through virtual classrooms became a preventive action to safeguard teachers and students from COVID-19. The uncertainty of the virus at that time has caused schools to close indefinitely. Therefore, conducting virtual classes via the Future Gate e-learning system was the only option left during the period (Alubthane, 2021). Subsequently, MOE came up with the Madrasati Platform as an LMS facilitating teaching and learning in the Kingdom, particularly in schools in Riyadh (Aldossry, 2021). It turns out to be necessary for schools to adopt and utilize the Madrasati to teach courses (Alsalm, 2021). Simultaneously, teachers learned how to incorporate technology into their teaching (Shishah, 2021). The Microsoft Teams were utilized to operate the Madrasati (Oraif & Elyas, 2021). The virtual classroom is the same as the conventional classrooms regarding the number of teachers and students using the Madrasati. Consequently, schools began to utilize the Madrasati system and the different tools to conduct lessons via virtual classrooms and evaluate students' performance (Aldossry, 2021; Alubthane, 2021).

1.3 Factors Influencing the Utilization of Madrasati

The LMS utilization in public schools is affected by teachers' behavior toward using technology in accomplishing tasks and the degree of its multiplicity utilization in other societies (Ministry of Education, 2019; Masmali, 2020). M LMS adoption and use among Saudi teachers can be linked to technology PE. In this regard, M LMS utilization among teachers in Saudi Arabia is still low. Many studies have used four core factors that directly determine technology acceptance (BI) and use (behavior), and these include PE, EE, SI, and FC (Onalapo & Oyewole, 2018; Gunasinghe et al., 2019; Kułak et al., 2019). These factors are considered vital in measuring possible issues with new technology acceptance by school teachers in KSA, particularly in Riyadh (Alshehri et al., 2019). This study argues that behavioral intention affects teachers' attitudes toward new technology. The attitudes of Saudi teachers towards the utilization of M LMS entail the success of its implementation across public schools in Saudi Arabia. Teachers' attitudes toward acceptance to using M LMS are directly linked to the Unified Theory of Acceptance and Use of Technology (UTAUT). Within UTAUT, studies have established a significant relationship between FC and BI (Alshehri, Rutter, & Smith, 2019). Thus, BI factors need to be quantitatively measured to fully comprehend these behaviors involving teachers' intention toward LMS technology acceptance in Riyadh (Chao, 2019; Funmilola et al., 2019).

Due to the integration of LMS technology and its utilization in public schools among teachers, the beliefs and attitudes of teachers towards teaching and learning have constantly been considered crucial norms for its effective implementation in Riyadh (Ghavifekr et al., 2016; Almarri et al., 2019). Teachers' attitudes toward new technology are critical factors associated with the initial acceptance of LMS technology and future

behavior concerning LMS utilization. Teachers' behavior can be expressed as individuals' behavior or actions as they engage in aspects required to facilitate learning (Al-Shehri, 2017). This process has its origin in intrinsic belief and intention in the learning event. Teachers' knowledge is also linked to their attitude toward technology, such as adopting or rejecting it in teaching and learning (Urhahne, 2015). They established the belief that attitudes influence behaviors (Olugbara et al., 2020). Teachers' attitudes have been identified as the main predictor of the new technological utilization in the school context. Positive attitudes could motivate less technologically proficient teachers to learn the essential skills to use technology in teaching (Heyder et al., 2020). Attitudes shaped by intention are crucial for teachers' technology acceptance in Riyadh. Some school teachers in KSA are slow in accepting M LMS because they believe the technology may not fit well with their micro-or macro-performance and expectations (Masmali, 2020). In line with this, M LMS focuses on social factors and, more particularly, how teachers interact with LMS technology and the environment (e.g., Riyadh), representing their BI toward such interaction.

Moreover, BI toward LMS technology acceptance, adoption, and implementation can be measured by observational tools. These tools quantitatively capture these factors and how they affect teachers' teaching performance in public schools (Alahmari & Kyei-Blankson, 2016; Chao, 2019). The quantitative measurements, such as quantifying school teachers' preferences, attitudes, facts, and behaviors, can generalize outcomes from a larger teacher population in Riyadh. In this approach, it is possible to recognize, regulate, and manipulate particular outcomes of the teaching process by altering selected aspects of a teacher's explicit behavior, which can be quantitatively measured, such as PE, EE, SI, and FC. Teaching can be regarded as a cluster of distinct behaviors. Hence, alterations in one or more of these behaviors are presumed to affect teaching quality (Al-Shehri, 2017; Alnahdi, 2020). It could be argued that teaching behavior or BI is independent of the curricular background associated with the techniques (Elashhab, 2020).

Competence in the potential use of new technology, such as LMS, affects its adoption in schools (Kristiawan, 2020). Competence plays a significant role in computer learning and skills. The computer assists educators in facilitating learning by training them to be competent and even to motivate and accelerate students' learning. However, some teachers lack the competence to operate or use new technology in schools and colleges (Tran, 2020). These challenges include a lack of adequate competence, skills, and understanding of basic operating procedures of the new technology; for example, the LMS implementations in schools (Poulter & Cook, 2020; Siri et al., 2020). In addition to how technology can be utilized in the classroom to assist students in effectively learning their modules, The teachers' competencies to effectively handle computer-related technology have become crucial for the successful implementation of new technology at all levels of education, especially in the case of Saudi Arabia.

BI signifies a person's deliberate intention to be involved in a particular action (Sánchez-Prieto et al., 2017). In the current study, BI denotes how teachers perceive that they intend to utilize technology in education constantly. It is hypothesized as a mediator between examined factors (PE, EE, SI, FC, ATT, and COM) towards M LMS utilization.

The moderating role of age and gender has been previously used by studies (Mahdi & Al-Dera, 2013; Al-Hunaiyyan et al., 2020) to examine the relationship between variables of technological utilization concerning teachers' attitudes and behavior. A moderator is a third variable that impacts the strength of the relationship between a dependent and an independent variable. In this study, age and gender are variables that moderate the influence of BI toward the utilization of M LMS among teachers in Saudi public schools. Binyamin et al. (2020) have prior explored the moderating effects of gender and age on the students' acceptance of LMS in Saudi higher education. There is no study available in Saudi about the teachers' attitudes towards utilising M LMS in schools. Since age and gender can moderate the influence of factors (PE, EE, SI, FC, attitudes, and competence to use M) on M LMS utilization among Saudi teachers, the need to examine this relationship in the context of Saudi Arabia.

1.4 Statement of the Problem

In KSA, implementing modern technology into teaching and learning is essential, such as MLMS. However, MLMS is still not widely accepted or used among school teachers in KSA, especially in Riyadh (Masmali, 2020; Alkinani & Alzahrani, 2021). Since its launch in 2020, the M LMS has recently been implemented across Saudi schools, with inadequate levels of teacher and student engagement (Shishah, 2021; Almaiah et al., 2022). Research on the influence of UTAUT factors on M LMS acceptance and utilization in Riyadh's primary and secondary schools is scant or nonexistent.

Studies have indicated problems regarding the acceptance and utilization of new LMS technology in Saudi Arabia. Scherer et al. (2019) assessed the teachers' acceptance and adoption of digital new technology in education in Riyadh using the UTAUT. They found that the teachers had an adverse interest and intention towards new technology adoption in Riyadh because they felt it might not serve their future interests. Similarly, Almutairi et al. (2020) applied the UTAUT model to evaluate teachers' behavioral motivation toward technology acceptance and utilization in KSA. They discovered that teachers participated in technological use when they saw the importance and benefits of using such technology in their teaching career and teaching process. The UTAUT showed the effect of intention to accept and use technology (i.e., PE, EE, SI, and FC) on usage behavior (intention to use). However, many of the studies above did not examine the influence of PE, EE, SI, and FC on M LMS. The studies focused on other types of LMS, such as Classera. Based on the outcome of these studies, it appears that the role of teacher BI and utilization of M LMS does not exist in Riyadh and the influence of M LMS in classrooms is not clear. Therefore, it needs to be studied further.

Alshehri et al. (2020) uncovered the effects of UTAUT and usability qualities on students' use of LMS in Saudi tertiary education. The outcomes supported the UTAUT parameters' reliability and validity in the Saudi Arabian LMS setting. However, the study suggested that the teacher's intention and usage behavior based on UTAUT (PE, EE, SI, and FC) can be investigated by future study as a connection exists between the students' usage of LMS and the teacher's BI toward utilization because it's influenced by the social impact dimension. Research has indicated that BI is a mediating factor influencing technology utilization (Bervell et al., 2020; Agarwal, 2020). These studies showed that

new technology utilization has no significant effect on BI as a mediator. However, Singh and Sinha (2020) proved that new technology utilization significantly affects BI. The mediating role of intention is crucial as it assists in understanding the effect between technological origin and acceptance in particular contexts, such as schools in Riyadh. Similarly, Shah et al. (2021) proved that BI can mediate between technology and teachers' acceptance. Moreover, Bervell et al. (2020) showed that LMS-enabled blended learning use intentions in distance education can mediate the role of attitude based on technology-related stimulus-response. To summarize, the BI toward technology or LMS acceptance and utilization has the potential to influence teachers' teaching attitudes. This attitude can further shape their intention to use technology in the classroom.

According to Watson et al. (2020), teachers' attitudes are what prevent the incorporation of digital technology in teaching and learning since they are most frequently misinterpreted, misunderstood, and misconstrued. The rate of acceptance and utilization of 2.0 LMS technology in KSA is impacted by teachers' inadequate background knowledge and technological ability (Almutairi et al., 2020; Alghamdi & Holland, 2020). A scarcity of technological competence can hamper creative abilities (Kristiawan, 2020). The lack of technical competence of the teachers has been found to directly affect the achievement of the students in the learning environment, such as reducing their participation and demoralizing them from engaging with the new technology actively. Many factors might have contributed to teachers' shortage of technological utilization competence and integration in classrooms in Riyadh. example, According to Alghamdi and Holland (2020), a fundamental obstacle to properly integrating technology into teaching is that teachers are only permitted to participate in the implementation stage of projects involving instructional technology (such as M LMS). Granero-Gallegos (2020) found that teachers continue to be underrepresented in the planning of newly introduced technology in their classrooms at all levels, thereby disrupting the teachers' behavior, competence, and enthusiasm profiles. In a similar vein, several researchers have revealed that teachers lacked the M LMS technology abilities necessary for them to manage their teaching and learning efficiently (Alkinani & Alzahrani, 2021; Aldossry, 2021; Almaiah et al., 2022). In conclusion, lack of involvement in planning the new technology affects teachers' acceptance of newly introduced technology directly, which in turn affects their competencies in the newly introduced technology, such as M LMS. Lack of competency in using M LMS is one of the identified issues in Riyadh and Saudi Arabia in general.

In addition, the demographic factor, which includes age and gender, is another component that has the potential to moderate how much teachers use new technology. Consistent with this, Binyamin et al. (2020) found that age, gender, and experience negatively moderate technology usage among EFL teachers. However, some studies have found that gender and age have a moderating effect on technology use (Wiseman et al., 2018; Al-Hunaiyyan et al., 2020). This indicated inconsistencies in terms of the effect of age and gender on new technology adoptions and acceptances in the classroom, particularly in Riyadh or KSA.

Based on these knowledge gaps, including a lack of defined intention of teachers towards new technological adoption and utilization, insufficient evidence on how PE, EE, SI, FC, ATT, and COM may affect the teachers' utilization of M LMS in public schools, there is no clear evidence on how these factors (PE, EE, SI, FC, ATT, and COM) may affect

the teachers' intentions and utilization of M LMS technology in Riyadh. In addition, the lack of some FC in public schools in Riyadh could affect M LMS utilization among teachers. Therefore, there is a need for a study to examine the factors influencing teachers' BI and utilization of M LMS in Saudi public schools.

1.5 Objectives of the Study

This study investigates the factors influencing teachers' behavioral intentions and Madrasati (M) utilization in Saudi public schools. Therefore, the study was conducted to achieve the following objectives:

1. To determine teachers' performance expectancy, effort expectancy, social influence, facilitating conditions, attitude to use M LMS, competency to use M LMS, and behavioral intention toward M LMS utilization among teachers in Saudi public schools in Riyadh.
2. To determine whether performance expectancy, effort expectancy, facilitating conditions, social influence, attitude to use M LMS, competency to use M LMS, and behavioral intention significantly influence the utilization of M LMS among teachers in Saudi public schools in Riyadh.
3. To determine the mediating role of behavioral intention on relationships between performance expectancy, effort expectancy, facilitating conditions, social influence, attitude to use M LMS, competency to use M LMS, and M LMS utilization among teachers in Saudi public schools in Riyadh.
4. To determine the moderating role of gender and age on the utilization of M LMS among the teachers in Saudi public schools in Riyadh.

1.6 Research Questions

These research questions were formulated based on the first research objective (RO1).

1. What is the level of M LMS utilization among the teachers in Saudi public schools in Riyadh?
2. What is the performance expectancy of utilizing M LMS among the teachers in Saudi public schools in Riyadh?
3. What is the effort expectancy of M LMS utilization among the teachers in Saudi public schools in Riyadh?
4. What is the social influence of M LMS utilization among the teachers in Saudi public schools in Riyadh?

5. What are the facilitating conditions for M LMS utilization among the teachers in Saudi public schools in Riyadh?
6. What is the attitude to use M LMS of M LMS utilization among the teachers in Saudi public schools in Riyadh?
7. What are the competencies to use M LMS of M LMS utilization among the teachers in Saudi public schools in Riyadh?
8. What is the behavioral intention of M LMS utilization among the teachers in Saudi public schools in Riyadh?

1.7 Research Hypotheses

Objective 2

The second objective is to determine whether performance expectancy, effort expectancy, facilitating conditions, social influence, attitude to use M LMS, competency to use M LMS, and behavioral intention significantly influence the utilization of M LMS among teachers in Saudi public schools in Riyadh. The researcher has formulated the following hypotheses:

H1: There is a direct effect of performance expectancy on M LMS utilization among teachers in Saudi public schools in Riyadh.

H2: There is a direct effect of effort expectancy on M LMS utilization among teachers in Saudi public schools in Riyadh.

H3: There is a direct effect of social influence on M LMS utilization among teachers in Saudi public schools in Riyadh.

H4: There is a direct effect of facilitating conditions on M LMS utilization among teachers in Saudi public schools in Riyadh.

H5: There is a direct effect of attitudes on M LMS utilization among teachers in Saudi public schools in Riyadh.

H6: There is a direct effect of competence on M LMS utilization among teachers in Saudi public schools in Riyadh.

H7: There is a direct effect of behavioral intention on M LMS utilization among teachers in Saudi public schools in Riyadh.

Objective 3

to determine the mediating role of behavioral intention on relationships between performance expectancy, effort expectancy, facilitating conditions, social influence,

attitude to use M LMS, competency to use M LMS, and M LMS utilization among teachers in Saudi public schools in Riyadh., the researcher has made the following hypotheses:

H8: Behavioral intention mediates the performance expectancy of M LMS utilization among teachers in Saudi public schools in Riyadh.

H9: Behavioral intention mediates the effort expectancy on M LMS utilization among teachers in Saudi public schools in Riyadh.

H10: Behavioral intention mediates the facilitating conditions for M LMS utilization among teachers in Saudi public schools in Riyadh.

H11: Behavioral intention mediates the social influence on M LMS utilization among teachers in Saudi public schools in Riyadh.

H12: Behavioral intention mediates the attitude to use MLMS of M LMS utilization among teachers in Saudi public schools in Riyadh.

H13: Behavioral intention mediates the competency to use MLMS of M LMS utilization among teachers in Saudi public schools in Riyadh.

Objective 4

The fourth research objective is to determine the moderating effect of gender on the determinants of utilization of M LMS and its adoption by teachers in Saudi public schools in Riyadh. The researcher has made the following hypothesis:

H14: Gender moderates the influence of performance expectancy on M LMS utilization among teachers in Saudi public schools in Riyadh.

H15: Gender moderates the influence of effort expectancy on M LMS utilization among teachers in Saudi public schools in Riyadh.

H16: Gender moderates social influence on M LMS utilization among teachers in Saudi public schools in Riyadh.

H17: Gender moderates the influence of facilitating conditions on M LMS utilization among teachers in Saudi public schools in Riyadh.

H18: Gender moderates the influence of attitude to use M LMS on M LMS utilization among teachers in Saudi public schools in Riyadh.

H19: Gender moderates the influence of competency to use M LMS on M LMS utilization among teachers in Saudi public schools in Riyadh.

H20: Age moderates the influence of performance expectancy on M LMS utilization among teachers in Saudi public schools in Riyadh.

H21: Age moderates the influence of effort expectancy on M LMS utilization among teachers in Saudi public schools in Riyadh.

H22: Age moderates social influence on M LMS utilization among teachers in Saudi public schools in Riyadh.

H23: Age moderates the influence of facilitating conditions on M LMS utilization among teachers in Saudi public schools in Riyadh.

H24: Age moderates the influence of attitude to use M LMS on M LMS utilization among teachers in Saudi public schools in Riyadh.

H25: Age moderates the influence of competency to use M LMS on M LMS utilization among teachers in Saudi public schools in Riyadh.

In order to summarize the research objectives, questions, and hypotheses developed for this study, this study investigates the factors influencing teachers' BI and M LMS utilization in Saudi public schools. The aim of the study is to determine whether PE, EE, SI, ATT, COM, and BI significantly influence the utilization of Madrasati. The study attempts to answer the question: what is the level of M LMS utilization among the teachers in Saudi public schools in Riyadh? The researcher hypotheses attempt to validate whether there is a direct effect of PE, EE, SI, FC, ATT, COM, and BI on M LMS utilization among teachers in public schools in Riyadh (in line with Objective 2). BI mediates the relationship between PE, EE, SI, FC, ATT, COM, and utilization of M LMS among teachers in Saudi public schools in Riyadh (in line with Objective 3). Gender and age moderate the influence of PE, EE, SI, FC, ATT, and COM on M L MSM utilization among teachers in Saudi public schools in Riyadh (in line with Objective 4).

1.8 Significance of the Study

The findings of this study are essential in increasing the utilization level of M LMS among Saudi teachers. Moreover, the findings will provide helpful information for the M administration on encouraging the teachers to utilize the M LMS and how to solve the problems facing the M LMS. It is expected to add to the literature concerning the usage of M LMS among teachers. The findings will also provide comprehensive information for the researchers in generating more research concerning the teachers' utilization of M LMS in learning. In addition, the results of this study will assist in developing and supporting strategies for increasing M LMS use among Saudi teachers.

Based on the findings of this study, decision-makers can take the necessary steps to remove the obstacles, encourage positive factors, and design training programs to improve M LMS use among teachers. It will also enrich the theoretical knowledge of M LMS utilization in Saudi education and help educational decision-makers in the development and improvement stages to achieve successful implementation of learning with M LMS. The stakeholders will be informed on the status of M LMS use and the possible barriers to employing it in learning. Therefore, this study is critical because it

will support effective planning decisions regarding the future utilization of M LMS in education.

The findings will also benefit the Saudi education system, which may lead to and motivate a specific technology. This effort should enable them to meet the goals of Saudi's Vision 2030. It can also be helpful for the future development of the education system in Saudi to maximize the positive impacts of LMS on the learning environment and change the way teachers interact. Finally, the findings of this study will also serve as relevant material for students of ICT, education technology, and E-learning.

1.9 Scope and Limitation of the Study

This study investigates the factors (PE, EE, FC, SI, ATT and COM) influencing teachers' BI and utilization of M LMS in Saudi Arabia. The scope of this covers and focuses on teachers' utilization of M LMS in a public school in Riyadh. There are various types of LMS available, including Moodle, Classera, ITWorx and Microsoft Teams. Schools in Riyadh commonly use Microsoft Teams, which further limits this study's scope to this Microsoft Teams, limiting the generalization of the findings to other related cities within Saudi Arabia that are using different LMS tools. In this study, the data was collected via a set of questionnaires by relying on the teachers' perceptions rather than the schools or the students. The participants of this study are full-time teachers, not part-time teachers who are exempt.

The selected population is limited only to teachers in Riyadh public schools. The teachers were also assured that their responses were confidential. The results may also not be generalized to all the Saudi teacher population but only to specific groups with similar characteristics. Despite these limitations, the results of this study are subject to further research and justification.

1.10 Definition of Key Terms

This section presents the operational and conceptual definitions of relevant terms based on the literature to give clear comprehension and direction.

1.10.1 Performance Expectancy

PE is defined here as "the degree to which an individual believes that using the system will help him or she attain gains in job performance" (Venkatesh et al., 2003, p. 447). In this study, PE refers to how teachers perceive the utilization of M LMS as a valuable tool helping them better increase their performance while carrying out their educational tasks in schools,

1.10.2 Effort Expectancy

EE can be defined as “the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 448). Moreover, Nyembezi and Bayaga (2015) described it as a user free from struggle or effort of use. In this study, EE symbolises the degree to which school teachers perceive that utilising the M LMS will be easy to use or the ease of use of the M LMS tool.

1.10.3 Social Influence

SI is a construct derived from the Unified Theory of Acceptance and Use of Technology. Venkatesh et al. (2003) define SI as the degree to which an individual perceives that “important others believe” (for example, family and friends) they should use technology. It is also referred to as the transformation in an individual’s behavior due to others, deliberately or voluntarily. It is related to how people perceive themselves in relation to the enhancer, other people, and people (Zimmermann, 2020). In this study, SI refers to how the school teachers perceive social norms and values from other educators, colleagues, and families capable of enhancing their decision on using the M LMS.

1.10.4 Facilitating Conditions

FC can be defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system” (Venkatesh et al., 2003, p. 453, p. 453). It is also expressed how certain conditions support or boost the utilization of technology via exemplars, e.g. teachers (Peñarroja et al., 2019; Emstad & Sandvik, 2020).

In this study, FC refers to how teachers perceive the presence of available conditions that support their learning process. This support could be technical assistance and workshops to help in solving a problem related to the use of M LMS.

1.10.5 Attitude to Use M LMS

An attitude is a disposition to react regularly or hostilely to a particular individual (Thomas et al., 2020). It is a way of sensing or acting toward an individual, thing, or condition (Watson et al., 2020). It has also been referred to as an attitude, as a set of impressions and propensities that encourage an individual’s judgment towards people, thoughts, or entities (Nilsson, 2018). These impressions and propensities can be positive or negative towards entities or individuals.

In this study, "attitude to use M LMS" refers to the teachers' combination of feelings, opinions, and tendency to utilize M LMS in teaching practices. This attitude will be assessed in three constructs: affective, cognitive, and behavior.

1.10.6 Competency to Use M LMS

Competence is defined as the capability of adopting and using a specific technology effectively by gaining knowledge through extensive testing and learning in its research, development, and learning (Chi et al., 2020; Tran, 2020). In this study, competence refers to teachers' ability to effectively use all the selected features of the LMS, which include 18 tools, namely my data tool, study schedule tool, student tool, courses and resources tool, lessons tool, my courses tool, test tool, question bank tool, enrichment bank tool, assignment tool, learning paths tool, community communication tool, survey manager tool, announcements tool, public meetings tool, student inquiries tool, reports and statistics tool, and virtual classroom tool.

1.10.7 Behavioral Intention

BI is described as how difficult individuals are ready to attempt and how much fortitude they are preparing to exert to execute a behavior (Ouyang et al., 2020). It denotes how individuals intend to make sustainable use of technology (Chao, 2019). It also expresses an individual's deliberate intent to accomplish a specific task (Pangaribuan & Wulandari, 2018).

In this study, BI signifies the extent to which the school teachers perceive their intentions of utilising M LMS constantly and attending workshops shortly. This study hypothesizes BI as a mediator between all selected factors (PE, EE, FC, SI, ATT, and COM) towards M LMS utilization.

1.10.8 M LMS Utilization

The MOE launched M LMS because of the decision by the Saudi government to close schools in the Kingdom (Frad & Jedidi, 2022). The initial plan was for schools to utilize the Madrasati for the initial seven weeks in 2020, but as COVID-19 persisted, the MOE declared that schools would continue utilizing the Madrasati. The M LMS is an e-learning system with several tools that reinforce all educational levels' teaching and learning processes (Shishah, 2021). Moreover, it helps students acquire knowledge, skills, standards, and understanding, simultaneously keeping them up to date with new technology needs in the present and future (Alkinani & Alzahrani, 2021).

The M LMS features a virtual classroom, allowing teachers and students to meet through virtual conferences and recorded sessions. The M LMS also allows access to educational content, including notes, reports, videos, and sketches (Alsalm, 2021). Additionally, M

LMS contains instruments associated with lesson preparation and strategy, allowing teachers to scheme lessons considering the students' needs and challenges (Aldossry, 2021). This includes teachers designing assignments and exams utilising this system. The M LMS uses Microsoft Teams for communication among students, teachers, and parents.

Toward the end of 2020, the M LMS enabled over 88,000 virtual lessons for both private and public schools in Saudi Arabia (Alsalim, 2021). Within the M LMS platform, teachers have designed nearly 3 million e-exams utilising this system, and students have submitted over 14.9 million tasks with over 9.8 million questions to their teachers (Alubthane, 2021). Madrasati's features and performance are similar to Moodle, Blackboard, and Canvas (Alkinani & Alzahrani, 2021).

Researchers assert that both frequency of use and volume of use might be used to determine the real usage of a technology (Asiri, Bakar, & Ayub, 2012). These two metrics are dependent on how frequently and in what volume the technology is used.

The term "frequency of LMS utilization" describes how frequently a user has used a system over time (e.g., using LMS twice per week; Asiri, Bakar, & Ayub, 2012), which also symbolizes how frequently teachers use technology (Cha, 2010). As a result, the frequency of M LMS use may be related to favorable opinions of e-learning in general. For instance, instructors who accept the M LMS may be more inclined to use it frequently than those who follow more traditional ideas.

The term "volume of LMS utilization" describes how much time a user spends using a system during a given time frame (Asiri, Bakar, & Ayub, 2012). Volume is the total number of logins the teachers make to the M LMS on a weekly basis. As a result, the volume will reflect the amount of time teachers spend using M LMS.

1.10.9 Learning Management System

A learning management system (LMS) is a software application for the administration, documentation, tracking, reporting, automation, and delivery of educational courses, training programs, or learning and development programs (Ellis, 2009). The learning management system concept emerged directly from e-Learning. Alternatively, a learning management system (LMS) is software that is explicitly designed to create, distribute, and manage the delivery of educational content (Mahnegar, 2012).

In the context of this study, LMS is a software application used to facilitate the implementation and administration of virtual classrooms and learning programs in public schools in Riyadh.

1.11 Summary

The background of this study is explained in this chapter, focusing on current literature on the utilization of LMS. Generally, the LMS is discussed with specific emphasis on the Madrasati LMS. It concisely stressed the advantages of its usage and the immense revolution in technology it sparked. It presents the current understanding that helps teachers achieve the best in its adoption and utilization in learning, especially in K-12 education.

This chapter has provided a concise introduction of M LMS, including its objectives, impact during COVID-19, utilization, and effect on Saudi public schooling in Riyadh. It has also briefly discussed M LMS utilization factors such as PE, EE, FC, SI, attitude, competence to utilize M LMS, BI, gender, and age. Consistent with these factors mentioned above, four research objectives were set.

1. To determine the PE, EE, SI, FC, ATT, COM, BI, and M LMS utilization of teachers.
2. To determine whether PE, EE, SI, FC, ATT, COM, and BI significantly influence the utilization of M LMS among teachers.
3. To determine the mediating role of BI in the relationship between (PE, EE, SI, FC, ATT, and COM) and utilization of M LMS among teachers.
4. To determine the moderating role of gender and age in the utilization of M LMS among the teachers.

Eight research questions were formulated alongside 25 research hypotheses based on these objectives. Numerous rationales and limitations of the study were addressed. Lastly, the key terms employed in this study were defined to give a clear understanding and guidance for the study. Consequently, the critical literature are reviewed and discussed in the next chapter.

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