Saudi Secondary Teachers' Perceptions of Using Madrasati Platform: A Conceptual Framework and a Pilot Study

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***Abstract*—The Madrasati platform was launched by the Saudi Ministry of Education as an official tool for distance learning in public and certain private schools, to improve the quality of education through a robust learning management system. However, its adoption among secondary teachers remains low, highlighting the need for improvements to facilitate widespread use. However, the factors influencing teachers' intentions to use the Madrasati platform have yet to be explored. This paper proposes a conceptual framework grounded in the Unified Theory of Technology Acceptance (UTAUT) model, with additional variables—such as system quality, service quality, and information quality—integrated as sub-factors under the Declan and McLean model to strengthen the model's predictive capacity. To ensure the validity of the model, a pilot study and content validity evaluation were conducted. The validation process included multiple stages of quantitative testing, such as content validity (n = 3 experts), correlation matrix analysis, Cronbach's alpha for all constructs (>0.70), exploratory factor analysis for all items (>50) to confirm the scale's factor structure and model validation. The results of this research are expected to provide valuable insights for administrators and stakeholders, helping them better understand the needs of teachers and devise strategies to encourage continued use of the Madrasati platform in enhancing teaching practices, ultimately contributing to the improvement of educational quality. This study has successfully developed a comprehensive and reliable framework for future investigations into learning management systems.**

***Keywords*—Madrasati, Unified Theory of Technology Acceptance (UTAUT) model, Declan and Mclean model, intention, usage, secondary teachers**

I. Introduction

Over the past few years, e-learning systems have profoundly influenced education in Saudi Arabia. Alkinani and Alzahrani [1] highlighted that the platform facilitates crucial teaching and learning processes, while technological advancements are increasingly vital in enhancing educational quality to align with international standards [2]. Consequently, the Ministry of Education (MoE) launched the Madrasati platform as a component of the Kingdom's Vision 2030 strategy, which seeks to digitally transform K-12 education [3]. The platform was introduced as an official tool for distance learning in both public and select private schools, improving educational quality through a robust and efficient learning system [4].

However, its adoption among teachers remains low, highlighting the need for improvements to facilitate widespread use [1, 4, 5]. The limited use of the platform has raised concerns, leading researchers to explore the factors that impact teachers' willingness to adopt the platform [2, 6]. Important factors identified include performance expectancy, effort expectancy, social influence, facilitating conditions, as well as the quality of information, system, and services 4,5,6]. It is essential to understand the factors that affect teachers' intentions to use the Madrasati platform in order to tackle these challenges. Through examining these factors, this study seeks to offer meaningful insights that can guide strategies aimed at improving the platform's adoption and overall effectiveness in education.

This study is among the first to explore the factors that influence secondary school teachers' intentions to use the Madrasati platform within Saudi Arabia's educational system. In Taif, a city in western Saudi Arabia, secondary schools are properly equipped to deliver high-quality education, benefiting both students and educators by ensuring a consistent academic schedule [7]. Given this context, the findings of this research will add to the existing literature on the effective use of the Madrasati platform by secondary school teachers, which is essential for realizing the Kingdom's educational goals. Research on e-learning adoption in Saudi Arabia remains limited, with most studies concentrating on the acceptance of the technology of the Madrasati platform by teachers or even students [1, 8].

The goal of this study is to extend the Unified Theory of Technology Acceptance (UTAUT) and the DeLone and McLean (DM) models to understand the factors influencing teachers' intentions to use the Madrasati platform, ultimately influencing actual usage. As a result, the outcomes of this study are expected to offer valuable insights for future research on Madrasati, particularly about the mediating role of intention on UTAUT factors like performance expectancy, effort expectancy, social influence, and facilitating conditions, as well as DM factors such as service quality, information quality, system quality, and the actual use of the Madrasati platform.

This paper aims to address the following question: What is the appropriate model to identify the key determinants of secondary school teachers' intentions to use the Madrasati platform, ultimately influencing actual usage, thereby contributing to the ongoing efforts to improve educational quality and digital engagement in Saudi Arabia?

II. Literature Review

A. Madrasati and Related Work

Madrasati is a digital platform equipped with interactive tools and features designed to support teaching and learning across all educational levels, from 1st to 12th grade [7]. It is used in schools to assist teachers in Grades 1 through 12 in improving their teaching practices [9]. According to the MoE report (2021) [3], the primary goal of the Madrasati platform is to provide high-quality education through LMS platforms

and support teachers in delivering lessons more effectively.

The Madrasati platform is a useful teaching tool where teachers have more opportunities to access Madrasati services that enhance education anywhere and anytime [10, 11]. Al Mahmud and Saqlain [9] indicated that the flexibility of time and place through Madrasati was one of the major motivating factors for teachers to use it. The Madrasati platform also offers multi-modal communication methods to foster interaction between students and teachers in the classroom. Modes of communication like faster grading, student-teacher interaction, self-learning opportunities, learning beyond classrooms, and learner autonomy are provided [12].

Although the Madrasati platform is available and widely used in Saudi Arabian public schools, teachers do not effectively utilize it in their teaching. The acceptance and use of the Madrasati platform have encountered several obstacles [4, 13]. Despite the potential of the Madrasati platform, its use in Saudi Arabia still requires improvement to ensure broader adoption nationwide [4]. Many teachers have not yet fully integrated the Madrasati platform into their teaching practices [1]. Some educators prefer traditional methods and are hesitant to incorporate Madrasati into their teaching approach [6].

One of the obstacles suggested by Al Mahmud and Saqlain [9] was a lack of technical knowledge and training in using Madrasati for in-service teachers, which could influence teachers' intentions towards the use of the Madrasati platform. In this respect, the intention to use the Madrasati platform is significantly influenced by their technical skills, and the absence of such skills leads to non-use of the current Madrasati platform. They suggest that providing adequate training could address this limitation and increase teachers' willingness to continue using the platform in their future classrooms [1, 10].

According to some researchers, the actual use of the Madrasati platform primarily depends on teachers' beliefs that a given technology meets their unique needs and aids in their students' academic objectives [1, 6]. The reason is that the information system generally depends on teacher intentions, participation, and satisfaction [14]. Teachers can have very different perceptions about and knowledge of the Madrasati platform, so it is essential to consider the influencing factors from their perspective of intention [5].

Numerous studies have focused on assessing the usability of Madrasati, as it is a crucial factor for any newly introduced e-learning system (Table 1). Additionally, several predictors influencing the intention to use the Madrasati platform have been identified in the existing literature. Some studies used TAM to find the predictors of intention to use Madrasati, including teachers and students [1, 15]. Other studies, for example, Alharbi *et al*. [5], utilized the UTAUT model to explore teachers' intention to utilize the Madrasati platform in public schools within the Riyadh setting. Nevertheless, this study did not address all the variables that impact the intention to use Madrasati (e.g., DM variables).

Table 1. Summary of literature studies on the Madrasati platform

Author(s)	Country	Target population	Sample size	LMS type	Acceptance model	Findings
Alkinani & Al Zahrani, 2021 [1]	SAUDI ARABIA	Teachers	200	Madrasati	TAM	1) Perceived ease of use and perceived usefulness showed a significant effect on the attitude. 2) Attitude showed a significant effect on the actual use
Almaiah *et al*., 2022 [4]	SAUDI ARABIA	Students	3000	Madrasati	TAM	Significant effects for service quality, system quality, and content quality, technology infrastructure, security concern, awareness factor, training, management support on the behavioral intention
Alharbi *et al*., 2022 [5]	SAUDI ARABIA	Teachers	374	Madrasati	UTAUT	1) Significant effect for the competency on the actual use through the attitude. 2) No significant direct effect for the attitude on the use of LMS. 3) Age and gender failed to show a moderating effect of the model
Alharbi *et al*., 2022 [5]	SAUDI ARABIA	Teachers	374	Madrasati	UTAUT	1) Behavioral intention showed significant mediator for the effects of performance expectancy, social influence, and facilitating condition 2) Age moderated the relationship between the independent variables (except for performance expectancy) and the use
Sulaymani *et al*., 2022 [15]	SAUDI ARABIA	Students	265	Future Gate Project and Madrasati	TAM	1) Significant effects for perceived ease of use, perceived usefulness, and self-efficacy on the behavioral intention 2) Age and gender are Moderators
Alharbi *et al*., 2022 [5]	SAUDI ARABIA	Teachers	374	Madrasati	UTAUT and TAM	1) Significant effects for performance expectancy, effort expectancy, social influence, facilitating conditions, attitude, and competence on the actual use

B. Critiques and Challenges in the Adoption of the Madrasati Platform

The Madrasati platform has been widely integrated into the education system in Saudi Arabia as a tool for enhancing teaching and learning. Several studies have highlighted positive experiences with the platform, with teachers reporting that it helps improve time management, supports efficient teaching, and provides an ideal model for motor skills development [6, 10, 11]. However, despite these benefits, some teachers have expressed reservations about fully embracing Madrasati as a teaching tool [6]. Specifically, the platform has not always been effectively utilized, especially in secondary schools [4]. One key issue is the

insufficient training provided to teachers, which has been identified as a significant barrier to its widespread adoption [3, 5, 10].

Moreover, despite the government's efforts to promote the platform, many Saudi teachers still prefer using alternative technologies for teaching, such as social media platforms (e.g., Facebook, Twitter, YouTube) and other digital applications [16]. Traditional face-to-face instruction has remained the preferred teaching method for many teachers [10]. Furthermore, other studies have shown that Saudi teachers tend to use educational applications such as Google Classroom and YouTube for teaching reading and writing skills, with some teachers relying on computer software to teach writing [17]. These findings raise concerns about the Madrasati platform's adoption, as teachers' preferences for alternative technologies might hinder the platform's effectiveness as intended by the government.

Several critiques have focused on usability issues with the Madrasati platform. Teachers have reported problems such as navigation difficulties, broken features, error messages, compatibility issues, and accessibility problems for disabled users [18]. Aldossry [19] and Almaiah *et al*. [4] argued that the Madrasati platform is time-consuming rather than easy to use, which further discourages its use. Other researchers have identified the design and usability of the platform as significant barriers, with teachers citing overcrowded virtual classrooms and other technical obstacles [10, 20].

Facilitating conditions also play a crucial role in determining teachers' intentions to use the Madrasati platform. Several studies have highlighted challenges such as insufficient training, limited access to technology, connectivity issues, and a lack of technical support [5, 9]. These challenges emphasize the importance of addressing facilitating conditions to enhance the adoption and utilization of the platform.

In summary, while the Madrasati platform holds significant potential for improving educational outcomes in Saudi Arabia, the literature reveals several obstacles that need to be addressed, including usability issues, insufficient training, and lack of access to necessary resources. By addressing these concerns, future efforts can help promote the effective use of the Madrasati platform among teachers, ensuring that it fulfills its intended role in Saudi schools.

C. The Integration of the UTAUT and DeLone and McLean Models

Despite these empirical studies, the literature indicates that no studies have looked at the UTAUT and DeLone-McLean models to identify factors that influence the teacher's intention and adoption of LMS platforms, e.g., the Madrasati platform. Even if there are studies on the control and use of the Madrasati platform, the studies were limited to learners and university instructors [21, 22].

The integration of the UTAUT and DeLone and McLean (DM) models is crucial for providing a comprehensive framework that accounts for both individual and system-related factors affecting technology adoption. The UTAUT model, developed by Venkatesh *et al*. [23], focuses on four key constructs, performance expectancy, effort expectancy, social influence, and facilitating conditions that influence an individual's behavioral intention to use technology. However, while UTAUT addresses individual perceptions and intentions, it falls short in explaining the actual use of technology, particularly in terms of system quality, service quality, and information quality.

This limitation is effectively addressed by incorporating the DeLone and McLean model [24] which focuses on the quality of information, system, and service, which are crucial elements in understanding the success of information systems like the Madrasati platform. The DeLone and McLean model emphasizes how these quality dimensions directly influence user satisfaction, which in turn impacts usage behavior. By integrating these two models, this study combines both the psychological and system-related factors influencing technology adoption, providing a more complete explanation of user behavior.

Furthermore, alternative models, such as the Technology Acceptance Model (TAM) and the Diffusion of Innovations (DOI) model, offer valuable insights but have their own limitations. TAM focuses primarily on perceived ease of use and perceived usefulness, which are similar to UTAUT's constructs but do not account for external factors like social influence or facilitating conditions. Similarly, the DOI model emphasizes innovation characteristics (e.g., relative advantage, compatibility) but overlooks individual perceptions and system-related factors that are critical for understanding the use of educational technologies.

The combination of UTAUT and DeLone and McLean models overcomes the limitations of these alternative frameworks by incorporating both the individual's intention to use the technology and the system's ability to meet user needs. This integrated approach offers a more robust and comprehensive understanding of teachers' adoption of the Madrasati platform, addressing the complex interplay of psychological, social, and system-related factors. Hence, to better understand teachers' behavioral intentions to utilize the Madrasati platform, this study intends to apply these models to assess factors affecting the adoption and use of the Madrasati platform.

D. Teachers' Perspectives on the Use of the Madrasati Platform

Teachers' perspectives on the use of the Madrasati platform demonstrate a variety of viewpoints. In the study conducted by Alkinani and Alzahrani [1], the efficacy of Madrasati was scrutinized through a survey encompassing 200 teachers chosen at random. The results of their investigation unveiled a positive impact of Madrasati on the pedagogical process. Furthermore, their findings illuminated a high level of satisfaction among teachers who engaged with the platform.

Another scholarly endeavor by Alqahtani [12] delved into the realm of English language educators' viewpoints regarding the utilization of Madrasati. The outcomes of this research highlighted a myriad of advantages linked to the adoption of Madrasati, including expedited grading procedures, enhanced student-teacher interactions, increased avenues for self-directed learning, exploration beyond traditional classroom settings, and the cultivation of learner autonomy.

In a separate study, [10] argued that the functionality of the Madrasati platform among schoolteachers in Saudi Arabia

falls short of expectations, signaling a pressing need for enhancements, particularly in addressing prevalent navigation challenges. Teachers identified various usability challenges encountered when utilizing the Madrasati platform, including navigation difficulties, lack of error prevention mechanisms, message errors, compatibility issues, and limited content accessibility for users with disabilities.

The findings of Al-Thumali [25] revealed that the Madrasati platform enables teachers to manage time more effectively compared to traditional methods of teaching physical education. Teachers reported greater satisfaction when using the Madrasati platform to teach physical education lessons. The platform also supports efficient teaching and offers an optimal model for motor skills development, proving more effective than traditional physical education teaching methods.

Alsalim [20] identifies primary school teachers' challenges with using Madrasati during COVID-19. A survey of 390 teachers in Riyadh City revealed the main obstacles, including difficulty with beginner students and overcrowded virtual classes. Teachers ranked students' abstention from new education types as a less significant obstacle. The study showed gender differences in platform usage, but no significant variations based on educational background or experience.

E. The Proposed Framework

As illustrated in Fig. 1, the initial part of the model focuses on the four key constructs of UTAUT—performance expectancy, effort expectancy, social influence, and facilitating conditions—along with intention, which is believed to influence the actual use of the Madrasati platform. The conceptual framework of this study aims to evaluate how these four UTAUT factors affect teachers' behavioral intentions to adopt the Madrasati platform. In this context, the study also considers the unique culture and environment of the research population. Previous studies have shown that these factors contribute significantly to understanding teachers' intentions to use LMS for teaching [26]. This approach is particularly beneficial, given the limited empirical research on the intention behind LMS usage [27].

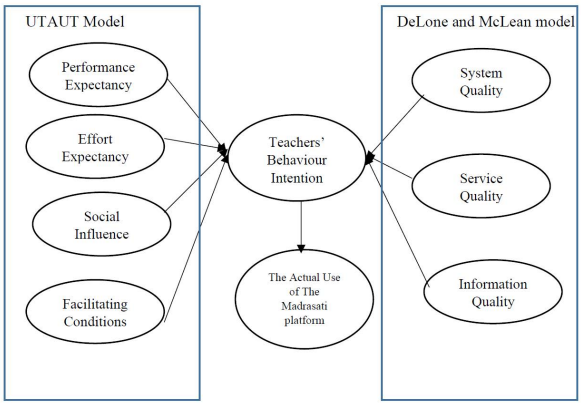

Fig. 1. The proposed conceptual model.

The second part investigates whether the DeLone and McLean quality factors predict school teachers' use of the Madrasati platform. In contrast, the third part of the model examines the influence of intention to use, which is suggested to impact the actual use of the Madrasati platform. The intention is proposed to mediate the relationship between the UTAUT and DeLone and McLean factors and the actual use of the Madrasati platform. Consequently, this enables the researcher to examine the three critical facets of the Madrasati platform: why teachers decide to use the Madrasati platform and how they control their intention to use it.

1) Performance expectancy

Performance expectancy refers to the degree to which teachers believe that using the Madrasati platform will improve their teaching effectiveness [23]. It is considered the most significant predictor of the intention to adopt and use technologies, both in voluntary and mandatory contexts [23]. In the case of the Madrasati platform, performance expectancy is viewed as the key factor influencing teachers' acceptance of the platform, leading them to use it to facilitate and enhance their teaching practices [1].

2) Effort expectancy

Effort expectancy refers to the extent of perceived easiness associated with using the Madrasati platform for teaching [23]. For the reason of workload attached to individual teachers, effort expectancy was a source of concern for most, especially how simple it is to use the desired technology . The literature has shown that effort expectancy often influences teachers' intentions to accept the Madrasati platform for educational purposes [3]. Alkinani and Alzahrani [1] found that effort expectancy is a key factor influencing the use of LMS platforms, like Madrasati, for teaching in Saudi Arabia.

3) Social influence

Social influence refers to the extent to which teachers perceive how important the opinion of their peer teachers is if they accept and use the Madrasati platform [23]. Masmali and Alghamdi (2021) found that social influence played a significant role in shaping elementary school teachers' behavioral intention to use online learning platforms, such as Madrasati. Recent studies indicate that social influence is a key factor affecting the adoption of the Madrasati platform among teachers in Saudi Arabia [3].

4) Facilitating conditions

Facilitating conditions refer to the degree to which teachers are satisfied with the technology and technical infrastructure available to support the use of the Madrasati platform [23]. Thus, for teachers to adopt the Madrasati platform they need to validate the availability of necessary resources, and Internet support as a facilitating condition for their acceptance and use of the Madrasati platform [13]. Similarly, the availability of Madrasati platform administrators, technical assistants, and related support services within the school will convince lecturers to accept and use the Madrasati platform [3].

5) Service quality

Service quality is defined as the support or assistance provided by the service provider of the information system [28]. It also encompasses the availability of various communication channels to promptly assist users in resolving issues [28]. Moreover, providing system support services is considered one of the most crucial responsibilities of an institution, as technical support plays a vital role in ensuring the successful adoption and use of the Madrasati platform among teachers in Saudi Arabia [1].

6) System quality

System quality refers to the users' expectations and perceptions regarding the system's characteristics, including ease of use and ease of understanding [24, 29]. When students are capable of verifying the dependability, comprehensibility, precision, and well-organized nature of the course material, along with an up-to-date Madrasati platform, their likelihood of satisfaction while utilizing the corresponding system increases [8]. Alkinani and Alzahrani (2021) showed that the system quality positively affects teachers' attitudes which, significantly impacts Madrasati platform usage. Furthermore, a study by Almaiah *et al*. [4] found that system quality positively impacts the adoption of the Madrasati platform in Saudi Arabia. Thus, improving the system quality of the Madrasati platform is essential for boosting its adoption and usability among both students and teachers in Saudi Arabia.

7) Information quality

The information quality construct of LMS refers to "the extent to which instructors' teaching performance is improved through the use of information obtained from or facilitated by such systems [23, 28]. Many scholars have investigated the role of information quality as a factor influencing teachers' intention to use the LMS; for instance, accuracy, sufficiency, preciseness, and timeliness [23, 28]. Other studies have explored the connection between information quality and the intention to use LMS tools in various contexts [30]. Similarly, Sulaiman [31] employed structural equation modeling, with results analyzed using SmartPLS 4.0 software. The findings revealed that information quality has a significant positive correlation with the perceived usefulness of LMS. Based on the theoretical framework and literature reviewed, the following hypotheses are proposed to guide this study:

H1: Performance expectancy is positively related to the intention of teachers to use the Madrasati platform.

H2: Effort expectancy is positively related to the intention of teachers to use the Madrasati platform.

H3: Social influence is positively related to the intention of teachers to use the Madrasati platform.

H4: Facilitating conditions are positively related to the intention of teachers to use the Madrasati platform.

H5: Information quality is positively related to the intention of teachers to use the Madrasati platform.

H6: System quality is positively related to the intention of teachers to use the Madrasati platform.

H7: Service quality is positively related to the intention of teachers to use the Madrasati platform.

H8: The intention of teachers to use the Madrasati platform is positively related to the actual use of the Madrasati platform.

III. METHOD

A. Research Design

A correlational research design was employed to explore the relationships between UTAUT and Delone and McLean model factors, as well as the intention to use the Madrasati platform among school teachers in Saudi Arabia. This approach allows for the quantitative analysis of how various factors influence teachers' intentions, ultimately influencing actual usage. A self-administered questionnaire is chosen to comprehensively address the study's hypotheses and objectives, ensuring generalizable outcomes. The data were collected from teachers in public secondary schools in Taif City, Saudi Arabia, specifically targeting those who utilize the Madrasati platform. This focused approach ensures that the sample consists of participants who are directly relevant to the study's objectives.

B. Population and Sample

Teachers in public secondary schools in Taif City, Saudi Arabia, specifically those who use the Madrasati platform, total approximately 6,608 teachers (3,402 female and 3,206 male) in the 10th, 11th, and 12th grades. The list of public secondary school teachers utilizing the Madrasati platform in Taif City was obtained from the Ministry of Education in Saudi Arabia, which maintains detailed records of teachers and their usage of educational technologies like Madrasati. This data is often compiled and updated annually, detailing the number of teachers per school, their use of specific platforms, and other relevant educational metrics. The inclusion criteria specify that participants must be teachers who have used the Madrasati platform, and both male and female teachers are eligible. The exclusion criteria state that teachers from primary schools and non-teaching staff or administrative personnel are not eligible to participate. We employed a simple random sampling technique to select 29 teachers using the Madrasati platform. Due to the smaller scale of the pilot study, we selected participants from a limited number of schools in Taif City. To control for participant variability, we ensured that teachers from different schools were included in the sample to represent a range of experiences with the platform. Although the sample size was small, this approach still aimed to capture a diverse range of teacher perspectives. Future studies with larger samples will allow for better control of variability and improve generalizability. Responses were analyzed to identify factors influencing teachers' intentions to use the platform.

C. Instruments

Table 2 provides a detailed overview of the measurements for the variables adopted in this study. It outlines the specific constructs and their corresponding metrics or scales used for assessment. This table serves as a crucial reference for understanding how each variable is operationalized and measured throughout the research.

Table 2. Measurement of the adopted study variables

Variable measurement	No. Items	Source
Performance expectancy	1) The Madrasati platform helps me to teach. 2) The Madrasati platform enables me to accomplish tasks (e.g. provide assignments, reports, etc.) more quickly. 3) The Madrasati platform improves the quality of my work (e.g. assignments, reports, etc).	[1, 3, 21, 32]

	4) The Madrasati platform increases my knowledge of the subject matter 5) The Madrasati platform is well integrated with all other aspects of my teaching assignment.	
Effort expectancy	1) Madrasati is known for its ease of use 2) I find it simple to become proficient in using Madrasati 3) The features in Madrasati are clear and easy to understand hence operating the system becomes much easier 4) Madrasati's features are straight-forward 5) Using the Madrasati requires time and effort and it rewards normal duties	[1, 3, 32],
Social influence	1) Being amongst the first to use the Madrasati within my circle of friends and family makes me special. 2) In general, the management of the school has supported the use of the Madrasati. 3) People who are important to me think that I should use the Madrasati platform. 4) Current technology trends in social life have increased the popularity of the Madrasati platform. 5) Nowadays, society expects learning to include the use of LMS like the Madrasati platform.	[21, 32]
Facilitating conditions	1) I have the resources necessary to use the Madrasati 2) A specific person (or group) is available in school for assistance with Madrasati 3) The facilities (e.g. Internet accessibility, WiFi) provided by management to use the Madrasati fully, meet users' needs 4) The workshops and training to familiarise teachers with the Madrasati are helpful and sufficient 5) Management support services and infrastructure gives teachers the confidence	[3, 32, 23]
System quality	1) The Madrasati platform has a well-designed user interface. 2) The Madrasati platform allows me to control my teaching activities. 3) The Madrasati platform offers flexibility as to time and place of use 4) The Madrasati platform provides the functions I need to do my teaching activities. 5) The Madrasati platform language and means of communication are effective. 6) I can easily access the Madrasati platform anytime I need to use it platform in any device or system.	[1, 31, 28]
Information quality	1) The Madrasati platform can provide me with accurate information. 2) The Madrasati platform can provide me with sufficient information to do my tasks. 3) The Madrasati platform can provide the precise information I need 4) I am satisfied with the accuracy of the information on the Madrasati platform. 5) The Madrasati platform can provide updated information regarding my tasks.	[1, 31, 28]
Service quality	1) Training on the operation of the Madrasati platform is sufficient. 2) I can communicate with the technicians through multiple channels when I encounter technical problems and require quick responses. 3) The training provided can enhance my ability to use the Madrasati platform 4) In general, the school provides enough support to help use the Madrasati platform.	[29, 31, 28]
Behavioral intentions	1) I predict that I will continue to use Madrasati 2) I believe that teachers will increasingly familiarize themselves with the Madrasati in the next 6 months 3) I am looking forward to attending workshops about the effective use of Madrasat 4) I expect to fully enjoy the use of Madrasati 5) I intend to make the Madrasati central to my learning in school.	[3, 32, 23]
Actual use	I use the "Forum tool" to enhance the dialogue with my students I use the "File-exchange tool" to share the course documents with my students. I use the "Assignment tool" to send/download/ upload tasks for all or particular students. I use the "Assessment Tool" to conduct online short tests/exercises. I use the "Grade book tool" to record/ edit or delete students' scores I use the "Virtual classroom tool" to enable synchronous communication with my students by using multimedia features. (For example, audio, video, text chat, application sharing).	[28, 3, 32]

D. Translation Procedure for the Questionnaire

The study's English instruments were translated into Arabic using a back-to-back method involving multiple proficient instructors to ensure comprehension and minimize cultural variance among Saudi respondents. Accordingly, the present study has tested the validity and reliability of instruments, which are discussed more thoroughly in the following pilot study and content validity section.

E. Ethical Considerations

Ethical considerations were a critical aspect of this study. Participants were fully informed about the purpose of the study, their right to confidentiality, and their voluntary participation. They were also made aware that they could withdraw from the study at any time without any negative consequences. The self-administered questionnaires were anonymous to ensure participants' privacy and the integrity of the data. All data collected was stored securely and used solely for this research. Ethical standards were upheld to ensure the protection of participants and the validity of the study.

IV. Pilot Study

The pilot study employed the Arabic version of the questionnaire and used simple random sampling to select 29 secondary school teachers from Taif City, Saudi Arabia. In addition, the data were verified for reliability by calculating Cronbach's Alpha (using SPSS software version 25). Table 3 below displays the findings of Cronbach's alpha values for all variables, which are over 0.7 and acceptable, according to Nunnally [33] (and Hair *et al*. [34]. These findings demonstrate that the chosen instruments' reliability is satisfactory.

Table 3. Internal consistency reliability of the instruments

The Scale	No. of Items	Cronbach's alpha
Performance Expectancy	5	0.872
Effort Expectancy	5	0.874
Social Influence	5	0.826
Facilitating Conditions	5	0.883
System Quality	6	0.882
Service Quality	4	0.712
Information Quality	5	0.881
Behaviour Intension	5	0.889
Actual Use of the Madrasati Platform	6	0.788

A. Content Validity

In this study, the content validity assessment was conducted by three professors with good expertise in the

educational technology field from Taif University, a public university in Saudi Arabia. The questionnaire was sent to the experts once they agreed to review it. The experts were chosen based on their backgrounds and expertise in educational technology. Overall, the experts reviewed all initial items and provided comments on the content, language, clarity, and appropriateness of the items. Based on expert feedback, several modifications were made to the questionnaire items. For Performance Expectancy, the item "Madrasati helped me reach my teaching goals" was revised to "Madrasati platform helps me to teach," and "I find the Madrasati useful for performing my teaching duties" was changed to "Madrasati platform enables me to accomplish tasks (e.g. provide assignments, reports, etc.) more quickly." In Effort Expectancy, the item "The Madrasati was easy to use" was deleted due to redundancy, and "I found the use of the Madrasati easier than other LMS tools" was revised to focus on expectations "I find it simple to become proficient in using Madrasati". Several items were also deleted, such as those related to Social Influence, Service Quality, Digital Literacy, Behavioral Intention, and Actual Use, as they were seen as repetitive or irrelevant. Additional changes included rewording items under Facilitating Condition and Information Quality, such as revising "I have the resources necessary to use the Madrasati" "and adding a new item regarding technical support. These adjustments aim to improve the clarity and relevance of the survey in assessing the use of the Madrasati platform. These adjustments aim to improve the clarity and relevance of the survey in assessing the use of the Madrasati platform. Thus, some modifications were made to some of the items based on the experts' comments in the field of educational technologies in preparing the questionnaire for the next phase.

B. Correlation Matrix

The primary purpose of using the correlation matrix for each variable in this study analyzed through SPSS, is to identify the most appropriate and homogeneous items for inclusion in the factor analysis. This matrix helps determine which items are acceptable based on their correlations, allowing for an essential assessment before collecting data from the entire sample. By classifying the strength of these correlations as mild, moderate, or strong, researchers can ensure a more standardized selection of items and minimize bias in the study. The use of a correlation matrix is widely recommended in the literature before running SmartPLS [35, 36].

Table 4. Correlation matrix of factors

Performance Expectancy (KMO=0.755, Eigenvalue=66.53%)						
Item	**PE1**	**PE2**	**PE3**	**PE4**	**PE5**	
PE1	1	*0.752*	*0.631*	0.489	*0.525*	
PE2	*0.752*	1	0.453	0.497	0.463	
PE3	*0.631*	0.453	1	*0.63*	**0.735**	
PE4	0.489	0.497	*0.63*	1	*0.631*	
PE5	*0.525*	0.463	**0.735**	*0.631*	1	
Effort Expectancy (KMO=0.803, Eigenvalue=67.05%)						
Item	**EE1**	**EE2**	**EE3**	**EE4**	**EE5**	
EE1	1	0.348	0.437	*0.526*	0.348	
EE2	0.348	1	*0.588*	0.495	1	
EE3	0.437	*0.588*	1	**0.952**	*0.588*	
EE4	*0.526*	0.495	**0.952**	1	0.495	
EE5	0.348	1	*0.588*	0.495	1	
Social Influence (KMO=0.765, Eigenvalue=59.72%)						
Item	**SI1**	**SI2**	**SI3**	**SI4**	**SI5**	
SI1	1	0.453	0.346	0.401	0.329	
SI2	0.453	1	*0.643*	*0.633*	*0.6*	
SI3	0.346	*0.643*	1	**0.709**	0.318	
SI4	0.401	*0.633*	**0.709**	1	0.437	
SI5	0.329	*0.6*	0.318	0.437	1	
Facilitating Conditions (KMO=0.838, Eigenvalue=68.28%)						
Item	**FC1**	**FC2**	**FC3**	**FC4**	**FC5**	
FC1	1	0.409	**0.721**	*0.64*	*0.609*	
FC2	0.409	1	*0.59*	*0.533*	*0.505*	
FC3	**0.721**	*0.59*	1	*0.645*	**0.667**	
FC4	*0.64*	*0.533*	*0.645*	1	**0.682**	
FC5	*0.609*	*0.505*	**0.667**	**0.682**	1	
Service Quality (KMO=0.687, Eigenvalue=54.18%)						
Item	**SeQ1**	**SeQ2**	**SeQ3**	**SeQ4**	**SeQ5**	**SeQ6**
SeQ1	1	0.232	0.374	*0.527*	**0.733**	*0.572*
SeQ2	0.232	1	0.467	0.272	*0.574*	**0.675**
SeQ3	0.374	0.467	1	0.445	*0.648*	**0.73**
SeQ4	*0.527*	0.272	0.445	1	*0.549*	0.265
SeQ5	**0.733**	*0.574*	*0.648*	*0.549*	1	*0.553*
SeQ6	*0.572*	**0.675**	**0.73**	0.265	*0.553*	1
System Quality (KMO=0.777, Eigenvalue=63.98%)						
Item	**SyQ1**	**SyQ2**	**SyQ3**	**SyQ4**	**SyQ5**	**SyQ6**
SyQ1	1	0.49	*0.51*	*0.574*	**0.733**	*0.572*
SyQ2	0.49	1	**0.704**	0.381	*0.574*	**0.675**
SyQ3	*0.51*	**0.704**	1	0.494	*0.648*	**0.73**
SyQ4	*0.574*	0.381	0.494	1	*0.549*	0.265
SyQ5	**0.733**	*0.574*	*0.648*	*0.549*	1	*0.553*
SyQ6	*0.572*	**0.675**	**0.73**	0.265	*0.553*	1

Information Quality (KMO=0.658, Eigenvalue=68.44%)					
Item	**IQ1**	**IQ2**	**IQ3**	**IQ4**	**IQ5**
IQ1	1	**0.67**	*0.571*	0.463	**0.991**
IQ2	**0.67**	1	*0.626*	0.439	**0.665**
IQ3	*0.571*	*0.626*	1	*0.508*	*0.601*
IQ4	0.463	0.439	*0.508*	1	0.431
IQ5	**0.991**	**0.665**	*0.601*	0.431	1
Behavioral Intention (KMO=0.775, Eigenvalue=69.52%)					
Item	**BI1**	**BI2**	**BI3**	**BI4**	**BI5**
BI1	1	*0.514*	*0.616*	*0.635*	0.458
BI2	*0.514*	1	**0.666**	**0.678**	**0.736**
BI3	*0.616*	**0.666**	1	*0.51*	**0.761**
BI4	*0.635*	**0.678**	*0.51*	1	*0.6*
BI5	0.458	**0.736**	**0.761**	*0.6*	1
Actual Use (KMO=0.765, Eigenvalue=67.21%)					
Item	**AU1**	**AU2**	**AU3**	**AU4**	**AU5**	**AU6**
AU1	1	0.357	0.021	0.254	0.391	0.41
AU2	0.357	1	0.385	0.445	*0.513*	0.389
AU3	0.021	0.385	1	0.344	0.193	0.25
AU4	0.254	0.445	0.344	1	*0.557*	*0.533*
AU5	0.391	*0.513*	0.193	*0.557*	1	**0.678**
AU6	0.41	0.389	0.25	*0.533*	**0.678**	1

The results of the correlation matrix in Table 4 for the performance expectancy, effort expectancy, social influence, facilitating conditions, system quality, service quality, and information quality influence teachers' behavior intention, and actual use the actual use of the Madrasati platform were significant, with mild-to-strong positive correlations among the items. However, based on the correlation matrix, we noticed that EE3 and EE4 have a very strong correlation of 0.952, and IQ1 and IQ5 show a similarly high correlation of 0.991. This level of correlation suggests redundancy between these pairs of items. In light of this, we decided to remove one item from each of these pairs to reduce overlap and ensure that each item measures a distinct construct. Specifically, we could consider removing either EE3 or EE4 for Effort Expectancy, and similarly, remove either IQ1 or IQ5 for Information Quality. This adjustment would help to streamline the questionnaire while maintaining its reliability and clarity. Moreover, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy for all variables showed adequacy for the sample size used in the pilot study to obtain these outcomes.

In our analysis, the correlations between variables were carefully examined, and we found that the correlation values were consistently below 0.90. According to standard guidelines, correlations under 0.90 are generally considered acceptable and do not indicate severe multicollinearity issues [37] Therefore, we do not anticipate any significant impact on the validity of our results due to multicollinearity. However, we will continue to monitor these relationships in future analyses to ensure the robustness of the findings.

C. Exploratory Factor Analysis (EFA)

In this study, we employed Exploratory Factor Analysis (EFA) to identify the latent variables underlying the factors influencing teachers' use of the Madrasati platform. EFA helps in understanding the interrelationships among observed variables and grouping them into factors that can explain the variance in the data more effectively. We used principal component analysis (PCA) with varimax rotation to extract the factors and determine which variables are most strongly related to each factor. This process allowed us to ensure that our measurement model is both reliable and valid, supporting the robustness of the study's findings. Table 5 showcases the loading for each item that was retained, all of which exceeded the criterion of 0.50 and were thus deemed practically significant [34]. Thus, the questionnaire of the present study involved 52 valid questions distributed for the ten domains of the study with excellent internal validity and reliability. The questionnaire is ready to be used for the data collection of the main target sample size of the study.

Table 5. Exploratory factor analysis: Item loadings

Study factors		**Component**									
		1	2	3	4	5	6	7	9	9	10
Performance expectancy	PE1	0.918									
	PE2	0.902									
	PE3	0.863									
	PE4	0.879									
	PE5	0.809									
Effort expectancy	EE1		0.913								
	EE2		0.964								
	EE3		0.907								
	EE4		0.910								
	EE5		0.964								
Social influence	SI1			0.873							
	SI2			0.912							
	SI3			0.924							
	S14			0.943							
	SI5			0.951							
System quality	SyQ1				0.878						
	SyQ2				0.921						

	SyQ4	0.853					
	SyQ3	0.801					
	SyQ5	0.925					
	SyQ6	0.880					
Service quality	SeQ1		0.808				
	SeQ2		0.871				
	SeQ3		0.875				
	SeQ4		0.885				
Information quality	IQ1			0.953			
	IQ2			0.953			
	IQ3			0.865			
	IQ4			0.893			
	IQ5			0.959			
Facilitating conditions	FC1				0.867		
	FC2				0.907		
	FC3				0.803		
	FC4				0.847		
	FC5				0.938		
Behavioral intention	BI1					0.948	
	BI2					0.962	
	BI3					0.929	
	BI4					0.910	
	BI5					0.913	
Actual use	AU1						0.954
	AU2						0.884
	AU3						0.829
	AU4						0.921
	AU5						0.943
	AU6						0.884

In conducting the EFA, we observed that all items had strong factor loadings, with values generally exceeding 0.7, indicating good associations with their respective constructs. For example, all items in the performance expectancy (PE1-PE5) construct demonstrated loadings above 0.8, confirming their strong correlation with the intended factor. similarly, items in the effort expectancy and behavioral intention constructs also showed high loadings, further supporting their relevance to the respective constructs. Importantly, no significant cross-loadings were observed, suggesting that each item primarily loads on its intended factor, which reinforces the validity and robustness of the factor structure. this lack of cross-loadings ensures discriminant validity, indicating that the items are measuring distinct constructs without overlap. Overall, these results demonstrate that the factor structure is both reliable and theoretically sound, with each factor representing a unique dimension of the research model.

V. Discussion

This study, a pilot investigation, aimed to assess the feasibility of using the proposed framework to examine factors influencing secondary school teachers' use of the Madrasati platform. While the sample size was small ($n = 29$), the preliminary findings offer valuable insights that contribute to understanding the initial challenges and opportunities in adopting the Madrasati platform in the context of Saudi secondary schools.

First, the results suggest that performance expectancy (the perceived benefits of using Madrasati) was a key factor influencing teachers' intention to use the platform, which is consistent with the expectations outlined in the UTAUT model. This aligns with the findings from previous studies [6], where teachers recognized the potential of digital tools in enhancing teaching effectiveness. However, as a pilot, the results are not generalizable and need further validation in a larger sample.

The pilot study also highlighted the importance of facilitating conditions, such as training and technical support, in shaping teachers' willingness to adopt the platform. Teachers expressed concerns about the lack of comprehensive training and the technical challenges they faced, which aligns with issues noted by previous studies [3, 4] While these issues were not anticipated to be so prevalent in this initial phase, they offer valuable insights for future research that could address these barriers in more depth.

Another key takeaway from this pilot study is the usability of the Madrasati platform. The teachers reported challenges with the platform's navigation and interface, which hindered their effective use of the system. This echoes findings from earlier studies (e.g., Shishah *et al*., [10]) and suggests that improving the user interface and addressing design issues should be a priority in future implementations of the platform.

Hence, while the pilot study results are not definitive, they provide a foundation for refining the research design and addressing potential barriers to the adoption of the Madrasati platform. The findings suggest that performance expectancy, facilitating conditions, and system usability are critical factors that should be further explored in a larger-scale study to gain a deeper understanding of the factors influencing the platform's use.

VI. Conclusion and Implications

This study uses the UTAUT and DeLone and McLean models as a foundation to develop a framework for understanding the factors influencing secondary school teachers' use of the Madrasati platform in Saudi Arabia. After conducting a thorough literature review, a conceptual model was proposed to address the research problem, incorporating key variables to enhance the framework's explanatory power. Future research will validate this model with a mixed methods approach, combining both quantitative and

qualitative analyses. The findings of this study aim to enrich existing literature on Madrasati and provide valuable insights to the Ministry of Education regarding the motivators and challenges faced by teachers in adopting the platform. Based on the study's results, we offer the following practical recommendations:

Ministry of Education: The Ministry should implement specialized and ongoing training programs tailored to teachers to ensure they are equipped with the necessary skills and knowledge to effectively use the Madrasati platform. Training should also focus on addressing specific challenges, such as navigation and usability issues, which were identified in the study.

School Administrators: School leaders should create an environment that actively supports the integration of the Madrasati platform into daily teaching practices. Administrators should allocate sufficient resources, such as time for teachers to experiment with the platform, as well as provide regular encouragement and technical support.

Platform Developers: Platform developers should take teachers' feedback into account to address usability and system limitations. Specifically, they should focus on improving the platform's design and functionality to resolve issues such as navigation difficulties, compatibility, and accessibility problems that have hindered its adoption.

These insights will allow the Ministry of Education, school administrators, and platform developers to collaboratively improve the overall quality of the Madrasati platform and encourage its continuous usage. By ensuring that teachers have the resources, training, and support to effectively use Madrasati, the educational experience for students will be enhanced, leading to better learning outcomes across the country. Teachers can also use this research to enhance their use of the platform, foster student engagement, and maximize the benefits of the platform for their teaching.

VII. The Limitations of Study

This study has several limitations that should be acknowledged. First, the pilot study sample size was relatively small (n = 29), which may affect the generalizability and robustness of the findings. While the results provide useful insights, a larger sample size in future studies would enhance the reliability of the results. Additionally, the use of a self-administered questionnaire introduces the potential for response bias, as participants may provide socially desirable answers or interpret questions differently. This could impact the validity of the responses. Furthermore, the study was conducted only with teachers in Taif City, which limits the applicability of the findings to other regions or educational contexts in Saudi Arabia. These limitations should be considered when interpreting the results, and future research may address these issues by expanding the sample size and examining different geographic regions.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Sultan Saad Alawgdani conducted the research, designed the study, collected the data, analyzed the data, and performed the statistical analysis. Siti Zuraidah Md Osman contributed to the literature review and provided valuable insights into the theoretical framework. Nurul Ashikin Izhar review the initial draft of the paper, and Siti Zuraidah Md Osman revised the manuscript for accuracy and clarity. All authors read and approved the final version of the manuscript.

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