Evaluating the Usability and Effectiveness of Madrasati Platforms as a Learning Management System in Saudi Arabia for Public Education

Edrees A. Alkinani[1]*

[1]Computer Science Department, College of Computing in Al-Qunfudhah
Umm Al-Qura University, Saudi Arabia

Abdullah I. A. Alzahrani[2]

[2]Computer Science Department, Shaqra University, Saudi Arabia

Abstract
Ministries of Education are integrating different Learning Management Systems (LMS) to enhance teaching and learning during the lockdown to avoid academic loss. The key factor for delivering a high-quality education through LMS platforms is teachers' acceptance and adoption of the platform. Madrasati platform (which means My school) was introduced by Saudi Arabian Ministry of education as the formal teaching and learning for distance education for public education levels. This study aims to examine the effectiveness, usability and adoption of "Madrasati" platform from teachers' perspectives in Saudi Arabia. "SUS, CSUQ" tests were used to test the usability of the new platform. Using quantitative research design, data were collected using questionnaire. 200 teachers were selected randomly answered the survey. Data was analysed descriptively and inferentially using SPSS (25). The results obtained indicate that the teachers are highly satisfied using Madrasati platform and technically it is well designed. Also, Madrasati has positive effect on teaching quality. Moreover, Madrasati has high usability in teaching. One of the key findings were that the quality of the information content in Madrasati has a strong effect on teachers' perception of the Madrasati usefulness that led to a positive attitude towards Madrasati. These findings would be useful to the ministry of education and institutions trying to integrate technology in their teaching and learning processes. Thus, this paper contributes towards more effective utilisation of the extensive functionalities that Madrasati have to offer, which will contribute toward the development of pedagogy in Saudi Arabia.
Keywords: *LMS; Madrasati platform; teaching; Effectiveness, Usability, Accessibility; Saudi Arabia.*

1. Introduction

Many institutions of learning now rely on the internet as a means of communication due to the widespread information and communications technology around the world. As such, schools and colleges have adopted e-learning as an essential tool for teaching and learning activities. The advantages of e-learning over the conventional learning method are obvious; e-learning can be easily adopted at any place and time if the facilities are available. It also provides numerous opportunities for new educational techniques and provides learners the chance to be active participants, be self-reflective, independent, and work collaborativel [1,2] In response to the improvement in online learning, Learning Management Systems (LMS) have been created as robust software systems for the management of academic activities; LMS was developed to aid in imparting knowledge and expedite learning activities. Educational institutions can also rely on LMS for the storage, management, and sharing of educational materials [3]. Numerous LMS platforms have been developed recently that offer different opportunities and functionalities to the users. Some of these recently developed LMS platforms are Desire2Learn (D2L), Blackboard (BB), and Moodle. It is generally acknowledged that LMS platforms can only be successfully adopted and applied when the level of their usability is high. Here, usability implies time-efficiency and ease of use during course preparation and delivery. LMS also improves learning performance as the learners and tutors will focus mainly on the course content rather than trying to cope with problematic technologies. Many studies have emphasized the level of attention and effort devoted to the design of LMS, to the extent that serious usability-related matters can arise [3]. It is, therefore, important that institutions embark on careful evaluation of the usability of any LMS platform before considering its adoption and implementation. The conventional face-to-face mode of learning has been discouraged around the globe due to the COVID-19 pandemic, forcing educational institutions to adopt emergency measures that will stop the spreading of the infection [4]. One of the containment measures adopted is the use of virtual learning through LMSs. Being a new technology, it is expected that teachers should be trained on how to use such platforms as they were not used to such a system of learning before now. This has raised many queries on the quality of education in this pandemic era [5]. In this study, the level of usability of Madrasati, as LMS platform, was evaluated from the perspectives of teachers in Saudi Arabia.

Most of the learning-related activities are conducted these days through LMS platforms; such activities include academic discussions, course content management, presentations, and the administration of quizzes. Despite the relevance of LMS platforms in the modern education system, studies are yet to be conducted on their level of suitability for higher learning institution [6,7]. A stud by [8] found the LMS platforms as a complicated platform

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that can handle various aspects of teaching activities using different technologies. Some institutions have customized some LMS platforms to meet their specific requirements but until now, only a few studies have focused on how these platforms meet the specific requirements of their end-user [9]. In Saudi Arabia for instance, some LMS software has been customized by the National Centre for E-Learning and Distance Learning (NCEL); they have come up with JUSUR, a local version of LMS that has been offered to the local universities for free; however, the suitability of this software for the intended usage is yet to be investigated. Several commercial and open-source LMS platforms are available for use by education institutions; these platforms offer a wide range of features and options. For instance, LMS platforms generally have useful tools for easy creation and management of course contents. Furthermore, modern learning platforms have other in-built management systems, such as institution resources management systems, collaborative learning support systems, virtual classroom management systems, and test-authoring systems [10]. Blackboard Vista, a modern LMS platform, has been adopted by King Saud University (KSU), Saudi Arabia. This platform enables teachers the opportunity to access course materials from any location. Teachers are also provided with the opportunity to send lecture materials and notes to the students via the platform. However, the level of accessibility and usability of these learning platforms are yet to be evaluated from the perspective of the teachers. In the current study, the new platform "Madrasati" has been introduced by the ministry during the school closure due to the Corona Virus spread in the kingdom. However, the usability, accessibility, effectiveness and whether it has been accepted by teachers or not still has not been investigated yet. Thus, this study seeks to fill the gap in the literature as a pioneer study to provide valuable results to the ministry of education and teachers.

1.1 Potentials of LMS in Education

The adoption of an LMS platform is mainly aimed at ensuring the secure flow of information between the users of the system. Teachers can also rely on the statistical analysis aspect of the LMS to assess the performance of the learners. For the effective use of the platform, it is expected that the intended users have a basic knowledge of computers. [11] stated that both teachers and students can benefit from online teaching and learning platforms. E-learning has been accepted as a means of education in most regions of the world and its popularity gained more ground recently due to the COVID 19 pandemic, forcing many institutions to devise alternative teaching methods [12]. According to[13,14], face-to-face learning, in conjunction with e-learning, closes the gap between teachers and students. [15] suggested that students prefer courses offered through e-learning systems because they are considered more useful compared to the conventional classroom method.

A survey in the University of Minho on the perception and experience of the students with Blackboard and MOODLE (the two common LMS platforms used in Portugal) focused on the preferences of the students, their mode of engagement with the course, and their perception of the various functions and features of the platforms. Generally, the view of the students remains that both platforms are mere complements of the existing teaching methods and never an alternative to classroom teaching and learning, though they acknowledged the contribution of the platforms to their learning activities [16]. A study on the use of MOODLE in Oman showed that the perception and attitude of students that were introduced to e-learning through MOODLE were positive towards MOODLE as they recorded improved learning performance and their level of understanding of the course content was enhanced. noted that most students opted for a face-to-face approach in conjunction with online activities, such as e-mails or chat sessions. The study by [17] on the attitude of students using MOODLE noted that the students have a positive attitude towards the platform as a learning tool; they considered it a suitable approach to modern teaching and learning. However, they are of the view that e-learning, despite its usefulness, cannot replace face-to-face learning completely. They underlined the availability and ease of accessing the teaching materials from any location as the positives of the platform.

In Saudi Arabia, a study noted that MOODLE is mainly used in higher institutions mostly for the sharing and distribution of academic materials. The students found it easy to use while the teachers appreciated it as a means of out-of-classroom communication with the students; it is also useful in digital resource management. The study participants also noted positive changes in their academic performance upon the adoption of MOODLE as a learning platform. However, it was observed that the female students avoided the use of the platform, while those that used the system did so with fake identities or registered as male participants. MOODLE was found useful in the study of an English language course in Slovenia in terms of its usefulness and time saving; it also improved the learning capability of the students. The learning model (full-time or part-time) was also not found influential on the student's perceived usefulness of online learning platforms. Th study also found that all the participants that use MOODLE downloaded their homework and lecture notes from the platform [18]. The benefits and issues regarding the use of MOODLE were studied in Hong Kong for a better understanding of the use of ICTs among teachers and learners. It was observed that during periods of low education budgets, authorities prefer to use open-source systems rather than licensed ones to reduce administrative costs. In such situations, MOODLE can serve as a low-cost learning platform for schools [19].

1.2 SUS and CSUQ Scales

John Brooke introduced the SUS in 1996 as a reliable, quick, and inexpensive way of evaluating the usability of technologies [20]. The SUS is a survey that consists of only 10 statements, and participants agree or disagree with the statements based on a 5-point Likert scale. A SUS score can be within the range of 0 and 100 for each participant. The score indicates the usability level of the technology from the participants' point of view without providing any explanation for the participants' perception [21]. Although many surveys were developed for evaluating the usability of systems, SUS has some distinguishing features. It is flexible enough to measure the usability of various systems, technologies, hardware, and software [22]. The SUS is simple and inexpensive compared to many other methods of system usability evaluation. Moreover, the questionnaire can be completed quickly because it is short and contains only 10 statements. The SUS score is between 0 and 100, which makes it understandable by experts and non-experts alike. Finally, many studies [23] have concluded that SUS is a valid and reliable tool even for a small sample size.

However, [24] reported that despite its advantages, SUS has rarely been used in evaluating LMS .

Various studies have suggested the existence of two underlying factors even though these factors are inconsistently aligned with that [25,26,27]. This implies the existence of a straightforward structure with two factors; one of these factors is aligned with the positive-tone items while the other factor is aligned with a negative-tone. The study by [28] developed a database that comprised > 9000 filled-in SUS questionnaires. Implementation of factor analysis (exploratory & confirmatory) showed the bidimensional nature of SUS although in a manner that was neither useful nor noteworthy.

A unidimensional model with all its items on a single factor cannot have the same level of fitness as the SUS model with an alignment between the two factors and the odd-numbered, positive tone items and the even-numbered negative tone items. The fitness of the latter model is also better than that of the Usability/Learnability model. It is considered that distinguishing item tone has no theoretical or practical application; hence, the SUS ought to be considered a unidimensional way of measuring perceived usability by researchers. A version of the Post-Study System Usability Questionnaire (PSSUQ) is CSUQ [29] which was initially designed for the collection of numerous completed questionnaires to assess the possibility of the PSSUQ factor structure identified in the usability testing being constant upon mailing the survey to participants. Being that the factors were similar, it implies that PSSUQ and CSUQ questionnaires can be applied in different study designs and with a range of user groups. There are no significant differences between CSUQ and PSSUQ except that the words are altered minimally to capture the different research designs. Such a small change is captured in Item 3; for the PSSUQ Version 3, the statement in Item 3 read, “I was able to complete the tasks and scenarios quickly using this system.” the CSUQ Version 3 has the same statement as follows, “I can complete my work quickly using this system.” There are 16 items in the current version of CSUQ. In this study, the review focused on the studies that employed PSSUQ as both models are closely related. IBM developed the PSSUQ in the 1980s during an internal project called System Usability Metrics (SUMS).

1.3 Madrasati Platform as a Learning Management System

Madrasati is an e-learning management system, which includes many educational features that support teaching and learning processes, and contribute to achieve the educational goals of the curricula and decisions. It also supports the achievement of skills, values and knowledge for male and female students to be compatible with the digital requirements of the present and the future [30]. The virtual classroom is a tool that provides safe lessons over the Internet through Microsoft's Team platform, in which the teacher interacts with his students, discusses them, answers their inquiries, assigns them the duties and electronic activities and motivates them to perform them. My school also provides more than 45,000 educational resources that take into account the individual differences between students (visual and cartoon videos, educational games, augmented reality, 3D objects, interactive and fun experiences, educational stories and books) and also provides tools for educational planning and design, as well as evaluation such as: tests Electronic, and question banks containing more than 100,000 refereed questions in most of the courses. Since the interaction between teachers and students, and between the student and the content, and between the students each other is one of the important elements in the e-learning journey, “Madrasati” has provided discussion spaces that enable students to interact, bypassing the psychological barrier that may affect them psychologically and socially. To promote digital health, students and teachers can communicate simultaneously via chat rooms, and asynchronously via e-mail and teacher rooms; To obtain feedback on the electronic activities and assessments that will be completed across my school. Finally, school leaders, educational supervisors and teachers can monitor performance and take corrective measures through a system of performance reports and indicators.

1.3.1 Educational Features of Madrasati platform

Madrasati platform consist of the following features:

- **Students:** Enable students to learn in a fun way through a range of services that take into consideration diversity. It also enables the students to download academic courses and enjoy educational electronic videos and educational games that facilitate student learning and perform tasks electronically such as HomeWorks, assignments, and exams. The students can also check his attendance and marks for his or her studies.
- **Parents:** The parent participates in the interaction with the school community towards innovative tools that reflect the level of performance and the progress of their children.
- **School Leaders:** Enable school leader to use a set of innovative tools to be an inspiration in supporting the educational and administrative staff for the digital transformation in education. For example, setting up the timetable for the school, follow up the educational process for both students and teachers.
- **Teachers:** Enables the teacher to implement distinct plans in the implementation of education using easy and supportive electronic tools such as questions bank, lesson plans, assignments, electronic tests, and providing virtual lessons. The teacher can also provide feedback on students preformed tasks.
- **Educational Supervisors:** Enable the educational supervisor to provide support to the teachers he or she supervises in the e-learning journey as well as follow up the achievement of learning outcomes with the tools, services and performance indicators provided by my school platform.
- **Kindergarten:** Provides E-learning tips and tools for teachers and parents of kindergarten students.
- **People with disability:** Provides E-learning tips and tools for teachers and parents of disabled students.

1.4 Madrasati Platform Acceptance and Adoption

Based on TAM, two factors that influence the acceptance of technology in any organization are perceived ease of use (PEOU) and perceived usefulness (PU). PEOU refers to the extent an individual is convinced that the use of a given system will be effortless, while PU is the extent to which an individual believes that the use of a given system will improve their performance level. The ways a person’s actions can be predicted from a range of known external parameters that constitute these two factors have been explained by TAM. This model explained IT usage as being dependent on a four-stage process [31] first, PEOU and PU of a

user about using a system are influenced by external variables; then, the beliefs of the user influence their attitudes (ATT) toward the use of the system. This further influences the intentions of the user to use the system, and finally determine the actual level of system usage. Considering the core of this model and by excluding the external parameters, our theoretical model rejects the 'intention to use' factor as opposed to the original TAM. This is supported by the results of the studies by [32,33]. where a teachers' persistent use of an LMS platform increases the willingness of the students to use the system. So, the students may have no intention of using a system despite their perception of it, especially when the teacher considers it unnecessary.

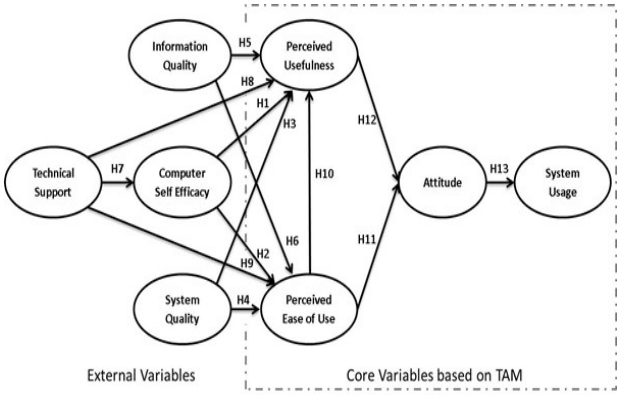

Figure 1. The proposed extended TAM for the evaluation of the acceptance of Madrasati

[34]recommended the inclusion of other external variables in TAM based on the specific technology being investigated because such inclusion could have an impact on the PEOU & PU of that technology. According to [35]these external variables should be studied as they are the major determinants of utilization. To improve the predictive capacity of TAM, numerous external factors have been considered [36]. From the reviewed literature in this work, it is concluded that the following external variables should be incorporated into the extended TAM model: System Quality (SQ), Computer Self-efficacy (CSE), Technical Support (TS), and Information Quality (IQ).

1.4.1 External variables

Computer self-efficacy (CSE) is categorized under *individual differences*. As per [37], self-efficacy refers to the confidence of a person in his/her capability to execute actions necessary to handle future situations. In this work, self-efficacy is positioned about computer systems; it is defined as the level of confidence of users in their capability to use the LMS. CSE, as per [38]contributes significantly to the shaping of the feelings and behaviour of individuals. They believed that a good level of efficacy expectations can drive success in any given task. CSE has also been found to have a significant influence on PU & PEOU in That [39] thus, the study hypothesize as follows:

H1: CSE has a positive effect on the PU of Madrasati.

H2: CSE has a positive effect on the PEOU of Madrasati.

System quality (SQ) and information quality (IQ) are both classified under *system characteristics*. Both variables are components of the extended Seddon IS Success model [40] which has SQ and IQ as quality determinants for a given IS [41]. The positive role of SQ in e-learning acceptance and use has been documented in the previous studies; therefore, we hypothesize thus:

H3: The quality of the LMS will have a positive effect on the PU of Madrasati.

H4: The quality of the LMS will have a positive effect on the PEOU of Madrasati.

H5: The quality of the content will have a positive effect on the PU of Madrasati.

H6: The quality of the content will have a positive effect on the PEOU of Madrasati.

Technical support (TS) is classified under *facilitating conditions;* hence, it is believed that TS will have an impact on the users' acceptance of LMS. Technical support is defined as the ability of a person to provide solutions to computer software and hardware problems as facilitated through online help desks [42]. The importance of TS in technology acceptance has been reported in numerous studies [38]; some of these studies believe that TS implementation in an organization favors ATT of users, leading to better technology acceptance and efficiency of the computing systems [43]. Hence, we postulate as follows:

H7: TS positively affects CSE for using Madrasati.

H8: TS positively affects the PU of Madrasati.

H9: TS positively affects the PEOU of Madrasati.

The proposed model does not incorporate the *social Influence* category because there are no suitable factors could in the literature to be included in the model.

1.4.2 Core variables

The core TAM variables and the causal relationships between them were also discussed based on previous studies. Given this, it is possible to generate the appropriate hypotheses for the validation of the proposed theoretical model in this study.

In TAM, the key determinants are PEOU and PU as they have a direct impact on the ATT of users towards the usage of new technologies [44] and this portrays the interest of an individual in using a specific system. Furthermore, TAM postulates a direct impact of PEOU on PU and this has been verified empirically by several studies [45]. Thus, this study postulates as follows:
H10: PEOU will have a positive effect on PU of Madrasati

H11: PEOU will have a positive effect on the user's ATT towards using Madrasati.

H12: PU will have a positive effect on users' ATT towards using Madrasati.

H13: ATT towards using Madrasati has a positive effect on SU

1.5 Research Objectives

1. Examine the effectiveness of Madrasati platform in teaching in Saudi Arabian Schools.

2. Explore the usability of using Madrasati platform in teaching in Saudi Arabian Schools.
3. Identify the barriers of using Madrasati platform in teaching in Saudi Arabian Schools
4. Investigate the factors that determine the acceptance of Madrasati platform in teaching in Saudi Arabian Schools?

2. Methodology

2.1 Research Design and Respondents

The study employed a fully quantitative research design using a questionnaire survey as data collection instruments. There are various reasons for adopting this research design in this study and among the reasons is that it offers a better view of the phenomenon when drawing conclusions from multiple sources. This study was conducted in Saudi Arabia; two hundred teachers participated in the study to answer the survey questionnaire. Respondents were randomly selected from Saudi schools as all teachers using Madrasati for teaching during the lockdown. The questionnaire was created to answer the objectives of the study.

2.2 Instruments

The survey included five main sections namely: section one included the demographic information; section two included teachers' attitudes to investigate their perceptions and satisfaction with the platform. The third section's effectiveness included teachers' experience, barriers to using Madrasati, the fourth section included the usability of Madrasati which included (SUS, CSUQ). Finally, the acceptance and adoption of Madrasati using TAM variables. The questionnaire was deployed to the respondents in their native language (Arabic) by the researcher then was validated by language experts "Two professors of Arabic language" for reliability. The survey questionnaires were distributed online using Google Form in the studying year 2020-2021. The participants were informed that involvement in the study was voluntary, meaning that anyone that wishes to withdraw at any time is free to do so. A 5 Likert scale was used in this study, with the points ranging from 1 = strongly disagree to 5 = strongly agree, except the CSUQ which consisted of 7 degrees scale. After designing the survey, a pilot study was conducted with 10 teachers to test the validity and reliability of the questionnaire through Cronbach alpha. The findings of the Cronbach Alpha test are presented in the table below.

2.3 Data Analysis

The statistical software SPSS 25.0 was used to analyze the data. Descriptive and inferential analyses were used to analyze the data. The hypotheses tests were performed using the mean and standard deviation, as well as the ANOVA t-test of the observed values. The results of model estimation were empirical measures of the indicators-constructs relationships (Measurement Model), as well as the relationships between the various model constructs (Structural model). With these empirical measures, one can make comparisons between the theoretically established measurement model and the structural model as captured by the sample data.

Table.1 Questionnaire validity

No	Variable	Cronbach's a	Composite Reality
1	Attitudes	0.850	0.899
2	Satisfaction	0.781	0.852
3	Experience	0.785	0.902
4	Barriers	0.874	0.914
5	Effectiveness	0.919	0.939
6	Usability (SUS)	0.818	0.891
7	Usability (CSUQ)	0.902	0.927
8	TAM	0.709	0.829

3. Results

3.1 Demographic Information

Findings of the demographic information showed that the majority of the teachers 100% (n=200) own a handphone. 50% (n=100) use technology devices to learn for more than one year. All teachers have internet access 100% (200) at home and 85% (170) at schools which indicates that teachers can easily access their learning material anytime anywhere. Teachers spend a long time on screen, as data showed 47% (n=95) spend 21-30 hours per week and 40% (n=80) spend 11-20 hours per week on the internet. The findings of the teachers' demographic information are presented in Table 2.

Table 2. Demographic Information

Demographic	N	%
Male	135	67
Female	65	33
20-30	50	25
30-40	90	45
40-above	60	30
Technology usage for Teaching purposes	N	%
never used	10	5.0
less than 6 months	100	50.0
Around 1 year	70	35
around 2-3 years	20	10
Access to Technology	N	%
I access the internet at home	190	95%
I access the internet at schools	170	85%
Screen Time	N	%
0-10 hours	25	12
11-20	80	40
21-30	95	52

3.2 Effectiveness of *Madrasati* Platform

This section presents the mean values of the opinion scores and the standard deviations of the teachers' responses; these results showed a high mean value of all the questionnaire items responded to by the teachers. This positive attitude could be due to the positive expression given by the teachers regarding the Madrasati. The results point toward a highly positive opinion of the teachers regarding the Madrasati.

Table 3. The scale of instructors' opinions about the usefulness of the Madrasati.

N	Survey items	Mean	SD
1	I found the Madrasati enjoyable.	4.51	0.64
2	I think all my colleagues who used the Madrasati are happy with it.	4.84	0.37
3	Any special skills or specialized technical knowledge are not needed to use the system.	4.75	0.55
4	I found the Madrasati user friendly.	4.60	0.63
5	All the features I needed were in Madrasati.	4.58	0.77
6	The interface of the Madrasati is simple and understandable.	4.66	0.54
7	I recommend the use of the Madrasati to other instructors.	4.88	0.33
8	The selection of an LMS using the Madrasati did not take much of my time.	4.60	0.65
9	I found the use of the Madrasati easier than other LMS	4.67	0.62
10	I hope the Madrasati can be kept.	4.73	0.52
11	I really enjoyed the Madrasati which met all my educational needs	4.76	0.43
12	The Madrasati was flexible.	4.68	0.49
13	The Madrasati was easy to use.	4.67	0.52

The findings show that the Madrasati is technically sound and well developed based on the high opinion of the teachers. The system can help the teachers in selecting the appropriate LMS that will meet their specific needs. This implies that the teachers can use the Madrasati with ease compared to the other available systems.

3.2.1 Teachers Satisfaction with Madrasati

Table 4. Teachers' satisfaction with the Madrasati

N	Items	M	SD
1	I think all my students who used Madrasati are happy about it.	4.85	0.36
2	I communicated easily with my students on Madrasati.	4.75	0.55
3	I sent the lecture notes I prepared in different formats easily to all the students.	4.84	0.37
4	I have done all my quizzes easily with Madrasati.	4.93	0.25
5	I sent the homework to students easily with Madrasati	4.90	0.30
6	I have easily done self-test at the end of each topic and sent feedback to my students with Madrasati	4.92	0.27
7	I can say that Madrasati satisfied all of my educational needs.	4.97	0.18
8	I have done all my activities that I could have done using classical methods with Madrasati	4.94	0.23
9	Madrasati fitted my teaching style.	4.91	0.29
10	Madrasati helped me reach my teaching goals.	4.95	0.21

The observed mean values in the above are higher than 3.90, meaning that the Madrasati is an invaluable tool, especially for the items with the maximum mean score. This means that the Madrasati could solve their specific needs. Table 4 also confirmed that Items 2, 3, 4, 5, and 6 exhibited high results, meaning that the teachers preferred the Madrasati to the other available systems.

3.2.2 Effectiveness of the Madrasati Platform

It was noted that the teachers had no pre-knowledge of using LMS even though most of the teachers (72%) agreed that they mainly distribute course materials through this platform. It was also the opinion of most of the teachers (89%) that the Madrasati is a good tool that can be used by the students to submit their reports. A good percentage of the teachers (82%) also felt that the Madrasati is a good platform for noting the attendance of the students. According to the teachers (83%), the Madrasati is a good system for displaying class notices. Regarding class assessments, only 40% of the teachers saw it as a good platform for conducting class tests (objective and subjective) while 25-31% have no regard for it in this perspective. Most of the teachers felt confident in the system as a good tool for uploading personal user profiles (Fig 2).

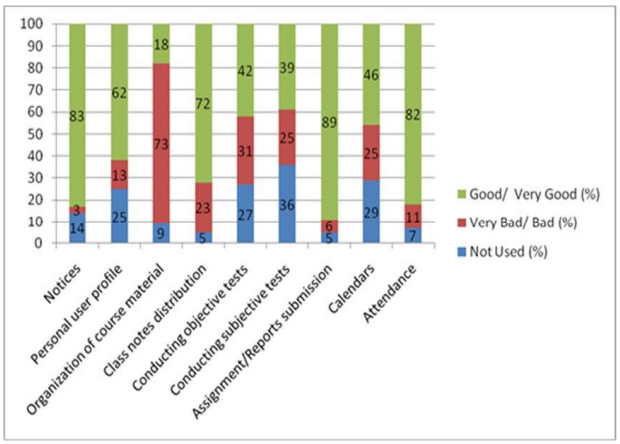

Fig 2: Teachers' experience of various features of Madrasati

Regarding the barriers to the use of the Madrasati, all the teachers reported that they have the required skills to use the system, showing that the teachers have a good level of technical competency that can drive the adoption of the Madrasati. To about 9% of the teachers, the use of the platform is an additional load to their daily workload while 5 % have reservations for the technology. Most of the teacher (91 %) that use the system reported no obstacles in using the system. However, 25% of the active users of the system noted issues with the network and bandwidth; lack of technical support was reported by 8% of the teachers (Fig 3).

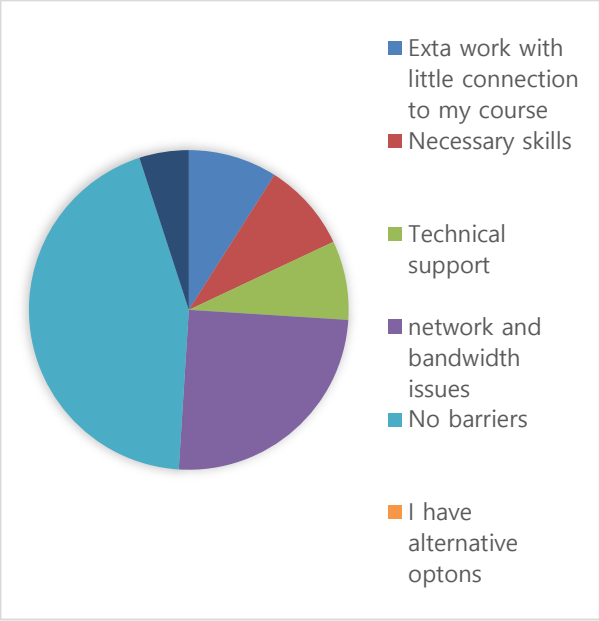

Fig 3: Barriers towards Madrasati, as felt by the teachers

On the effectiveness of the different features of the Madrasati, 70-80 % of the teachers noted improvements in the planning of class activities while 41% noted that learning was improved by uploading the session plans on the Madrasati. About 29% of the teachers recorded improvements in-class activities by using the system. About 20-33 % of the teachers do not depend on the platform to access their calendar for sharing of academic information but the use of the systems was approved by about 60% of the teachers as it improved learning and other class activities (Fig 4).

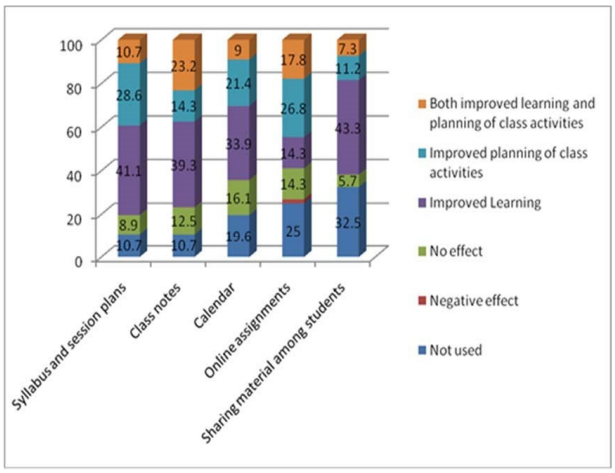

Fig 4: Effectiveness of different features of *Madrasati*

3.3 Usability of the Madrasati Platform

Table.5 Findings of SUS survey

No	Item	M	SD
1	I think that I would like to use this system frequently	4.20	0.36
2	I found the Madrasati unnecessarily complex	2.00	0.55
3	I thought the Madrasati is easy to use	3.90	0.37
4	I think I would need the support of a technical person to be able to use Madrasati	3.00	0.25
5	The found the various functions of Madrasati are well integrated	4.10	0.30
6	I thought there were too much inconsistency in Madrasati	2.40	0.27
7	I would imagine the most people would learn to use Madrasati very quickly.	4.00	0.18
8	I found the Madrasati cumbersome to use	2.10	0.23
9	I feel very confident using Madrasati	4.20	0.29
10	I needed to learn so many things to be able to use Madrasati	3.00	0.21
	Total	3.2	

Table 5 provides the high response of the teachers to the items in the SUS questionnaire. From the table, the mean response of the teachers to the positive statements 1, 3, 5, 7, and 9 was reasonably high, showing that the teachers found the Madrasati easy to use owing to the proper design and integration of its functionalities. Meanwhile, the teachers provided moderate responses to Items 2, 4, 6, 8, and 10, meaning that the Madrasati has some complexity and inconsistency issues despite being easy to use. In this study, the mean usability score of the use of the Madrasati was 3.2, indicating some levels of acceptable usability of the system.

Table 6 presents the high response of the teachers to the items in the CSUQ questionnaire. From the table, the response of the teachers to the items ranges from 2.39 to 3.82 (note that the score values range from 1 to 7; lower scores = higher level of satisfaction). The overall score of the CSUQ and the scores of the 3 subfactors are shown in Fig 5, with the overall CSUQ score being 5.09 which indicates a high level of usability of the Madrasati [46].

Table.6 Findings of CSUQ survey

No	Item	M	SD
1	Overall, I am satisfied with how easy it is to use this system.	4.95	0.64
2	It was simple to use this system.	4.85	0.37
3	I could effectively complete the tasks and scenarios using this system.	5.25	0.55
4	I was able to complete the tasks and scenarios quickly using this system	6.53	0.63
5	I was able to efficiently complete the tasks and scenarios using this system	4.60	0.77
6	I felt comfortable using this system.	6.70	0.54
7	It was easy to learn to use this system.	4.20	0.33
8	I believe I could become productive quickly using this system.	5.94	0.65
9	The system gave error messages that clearly told me how to fix problems	3.90	0.62
10	Whenever I made a mistake using the system, I could recover easily and quickly.	4.00	0.43
Total		5.09	

3.4 Teachers Acceptance and Adoption of the Madrasati

The data analysis showed support for Hypotheses H2, H4, H5, H7, H11, H12, and H13 based on the empirical data; however, H1, H3, H6, H8, H9, and H10 were not supported. IQ (Information Quality) was found as the most significant driver of the perceived usefulness of LMS from the teachers' perspective (H5). Other factors previously believed to influence PU (such as TS "Technical Support" (H8), SQ "System Quality" (H3), CSE "Computer Self-Efficacy" (H1) & PEOU "Perceived Ease of Use" (H10) were not supported by the results of this study even though they had a significant role in other aspects of the model. Previous studies have indicated that PEOU has a direct positive effect on ATT (H11) through the mediating role of PU (H10); however, it was observed that PEOU only had a direct impact on ATT "Attitude" in this study, meaning that H11 was accepted while H10 was not supported [47]. Furthermore, CSE was positively affected by TS while CSE also had a strong impact on PEOU; hence, the outcome of the analysis supported Hypotheses H7 & H2. Similarly, PEOU was positively affected by SQ and PEOU also affected ATT positively; hence, both H4 and H11 were accepted. Meanwhile, H9 was rejected because TS had a negative impact on PEOU, meaning that the low levels of TS drove a high level of PEOU of the system by the students. IQ "also had no obvious impact on PEOU, meaning that H6 was not supported. In this model, the key relationship is that IQ is the major PU predictor while PU had a positive impact on ATT, thereby supporting H5 & H12. Lastly, ATT related positively and strongly with SU and this means H13 was supported. Considering the R^2 values, 45% of the variance in PU was explained by IQ ($R^2 = 0.452$) while 32% of the variance in CSE was explained by TS ($R^2 = 0.321$). CES and SQ explained 71 % of the variance in PEOU ($R^2 = .714$) while PU & PEOU collectively explained the variance in ATT ($R^2 = 0.581$). The low R^2 value for SU ($R^2 = 0.170$) showed that ATT explained only 17% of the variance in the construct irrespective of the high path coefficient (0.520) for the relationship between both constructs.

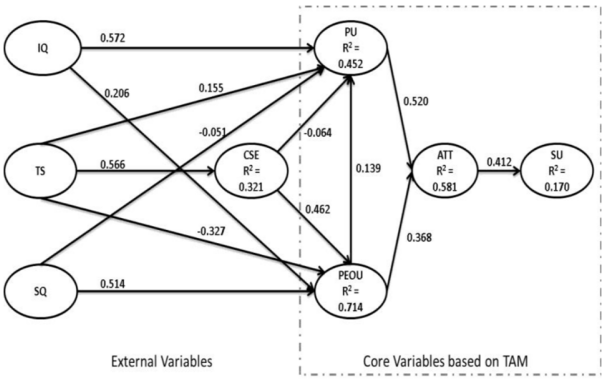

Figure 5. Findings of ANOVA correlation test

4. Discussion

The findings of this study were discussed and compared to the previous studies in this section. This study aims to determine the usability of the Madrasati platform from the teacher's perspective at "Madrasati", as well as to investigate the relationship between two of the common measures of PU which are SUS and CSUQ. Regarding the effectiveness of Madrasati it was framed to identify the PU of the Madrasati from the teacher's perspective, and the outcome of the study, there is high level of usability of Madrasati which was shown by the high mean score of teachers' responses. Earlier, it has been stated that the COVID-19 pandemic has affected the education sector negatively and may have a sustained impact on schools as most education institutions may have to continue with online teaching activities for the time being. Being that usability has an impact on the level of acceptance of technology and that the usability of the Madrasati affects its adoption, this is a serious issue to be addressed. Madrasati was also found to have a positive impact on as a positive effect on teachers' teaching methods. In general, teachers in the study valued Madrasati as a knowledge sharing and multimodal [22]. Teachers believe that Madrasati could be an important learning management system for engaging and motivating students [32] as it has the ability of giving fast feedback in real time [33]. gestures and emotions as features of the platform which can be displayed online by ticks, crosses, and emoticons, etc and the literature showed that these features are appreciated by students and teachers [23]. This portrays the need for the teachers to post-academic materials of high quality on the platform as this will improve the awareness of the students in using the technology. However, this result contradicts previous reports on the positive impact of PEOU on PU [35]. [36], there are cases where there is a questionable relationship between PU and PEOU, especially regarding LMS adoption. As per [40], learners may not consider PEOU a critical improvement factor when using the LMS.

Furthermore, both PU "Perceived Usefulness" and PEOU "Perceived Ease of Use", the key TAM components, had direct and positive impacts on the ATT "Attitude" despite PEOU having no indirect effect as mediated by PU "Perceived Usefulness". This is supported by previous findings where every construct was found to have a direct relationship with ATT despite having no empirical evidence to support the PEOU-PU relationship. SQ "System Quality" and CSE "computer self-efficacy" are external variables that positively influenced PEOU, meaning that the LMS must be

of high quality and desirable to the learners to facilitate "user-friendliness". CSE mediated the relationship between TS and PEOU and this is contradictory to previous reports where TS "Technical Support" showed a strong relationship with PEOU. However, not a specific negative relationship was observed between TS and PEOU, indicating that the teachers found the Madrasati easy to use as long as they have the necessary skills to use it in consideration of the available technical support. ATT "attitude" was also found to have a positive relationship with SU "System Use", but this did not translate into a strong R^2 value for SU (0.170). According to [27], the insistence of teachers on using the LMS can influence the usage of the system by the students. These studies submitted that the students may exhibit a positive attitude towards using the system but may not have the desire to use the system except when mandated by the teachers.

According to [37], teachers can use LMS in various ways. This study summarized the numerical and descriptive data on the selection of the Madrasati by teachers for their courses. This work differed from the previous ones by being the first study to be reported on the Madrasati platform. So, it is believed that the outcome of this study improves the existing literature. Although this study was conducted in a different field compared to the benchmarking studies, the teaching and learning techniques are similar. The interesting outcome of this work is that the teachers found the Madrasati as an invaluable tool based on their positive attitudes towards the Madrasati. Based on the high mean value of the teachers' opinions, it is concluded that the platform was well developed as its interface was easy and simple to use. However, there is a need to improve on the speed of the selection process of the Madrasati in a manner that much-specialized training or technical knowledge will be needed. Studies on the full implementation of virtual learning platforms are still rare in Saudi Arabia; this work will contribute to the development and implementation of virtual learning platforms in Saudi Arabia and other countries where such platforms are yet to be fully adopted.

5. Conclusion

This paper examined the effectiveness, usability, and adoption of "Madrasati" platform from teachers' perspectives in Saudi Arabia. The results obtained indicate that the teachers were highly satisfied using the Madrasati platform and technically sound and well developed. The findings also showed that Madrasati has a positive effect on teaching. The results also revealed that the usability of Madrasati at the current institution is adequate and usable in teaching. A major outcome of this work is the strong impact of the quality of the information contained in the LMS on the PU of the LMS from the user's perspective which translated to a positive attitude towards the system. Other factors, such as SQ, TS, and computer self-efficacy also affected the users' PU of the LMS directly or indirectly, thereby having a positive impact on the users' attitude towards the Madrasati. Institutions that are striving to implement technology in their teaching and learning processes can benefit from the outcome of this work; hence, this study contributes to the effective use of extensive functionalities available on the Madrasati as they will contribute to the development of pedagogy in Saudi Arabia.

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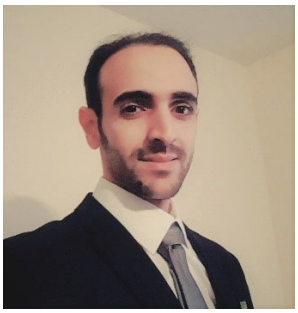
Edrees A Alkinani: Assistant professor; received his B.S. degree in Computer Science from Umm Al-Qura University, Saudi Arabia in 2007, and received M.S. degree in Web Technology from School of Electronic and Computer Science, Southampton University, United Kingdom in 2011. He received the PhD degree in Computer Science in September 2016 from University of Southampton, Southampton, United Kingdom. He currently works as an assistant professor, in Computer Science department in the Faculty of Computing At Umm Al-Qura University, Al-Qunfudhah branch. His research interests are E-learning, Semantic Web, and knowledge management.



Abdullah I. A. Alzahrani PhD in Computer Science from the University of Southampton (United Kingdom, 2020), Master of Computer Information Systems (Information Security & Assurance) from Middle Tennessee State University (United States, 2016), Bachelor of Computer Science from Taif University (Saudi Arabia, 2009), and Diploma in Computer Science (Programming Technology). Assistant Professor and the head of Computer Science Department at the College of Science and Humanities in Al-Quway'iyah, Shaqra University. His research interests are mainly focused on gamified e-learning, e-learning, information security and assurance, and human computer reaction.