

## Levels of Madrasati (M) LMS utilization among teachers

**Hamad Muaybid Alharbi**, Universiti Putra Malaysia, Faculty of Educational Studies, Department of Foundation Studies, 43400 UPM Serdang, Selangor, Malaysia, <https://orcid.org/0000-0002-1553-3956>

**Habibah Ab Jalil\***, Universiti Putra Malaysia, Faculty of Educational Studies, Department of Foundation Studies, 43400 UPM Serdang, Selangor, Malaysia, <https://orcid.org/0000-0003-4242-746X>

**Muhd Khaizer Omar**, Universiti Putra Malaysia, Faculty of Educational Studies, Department of Science and Technical Education, 43400 UPM Serdang, Selangor, Malaysia, <https://orcid.org/0000-0003-0794-5018>

**Mohd Hazwan Mohd Puad**, Universiti Putra Malaysia, Faculty of Educational Studies, Department of Science and Technical Education, 43400 UPM Serdang, Selangor, Malaysia, <https://orcid.org/0000-0003-1527-9174>

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### Abstract

Performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), attitudes, competence, and behavioral intention are all linked to poor Madrasati (M) utilization and acceptance among teachers. This study aims to examine the extent to which teachers are using M LMS. The impact of these parameters on M LMS usage was quantified using a survey method. Out of the 13,782 people, 374 teachers who use Madrasati in public schools were sampled. This study revealed that levels of M LMS utilization among teachers in schools were significantly affected by PE, EE, SI, FC, competence to use M, and behavioral intention factors. However, teachers' attitudes have an insignificant effect on M LMS utilization. This finding suggests that the success of M utilization in public schools is not dependent on the attitudes of teachers toward its use. This study examined factors influencing the extent of Madrasati adoption and utilization among teachers.

**Keywords:** Levels; LMS; Madrasati; UTAUT factors; Teachers

\* ADDRESS OF CORRESPONDENCE: Habibah Ab Jalil, Universiti Putra Malaysia, Faculty of Educational Studies, Department of Foundation Studies, 43400 UPM Serdang, Selangor, Malaysia,  
Email address: [habibahjalil@upm.edu.my](mailto:habibahjalil@upm.edu.my)

## 1. Introduction

All children in KSA are required to attend formal schooling starting at seven years old. In this light, the KSA has 30,625 schools (Binyamin et al., 2020) in both the private and public school systems. Riyadh has the most schools in the Kingdom. Modern technology, including learning management systems (LMS), has been integrated into teaching at all levels of education, including in primary and secondary schools in the Kingdom of Saudi Arabia (KSA) (Alahmari & Kyei-Blankson, 2018). Between 2007 and 2019, the Saudi government has made massive investments in developing the education sector (Alsaleh, 2019). Public schools in Riyadh encompass elementary schools (grades 1–6), middle schools (grades 7–9), and secondary schools (grades 10–12).

Riyadh is Saudi Arabia's capital and financial center, with a population of over 7.5 million people growing at a 7.84 percent annual rate (Peterson, 2020). The overall literacy rate is around 95.32 percent. Subsequently, Riyadh faces challenges in providing adequate access to education to the city's rapidly growing population (KSA). Managing these schools necessitates qualified teachers and a modern learning management system (LMS), such as Madrasati (M). The M LMS is an e-learning system with several tools that reinforce all educational levels' teaching and learning processes (Shishah, 2021). Following COVID-19, M LMS technology was introduced in 2020. The M LMS also provides access to educational content such as notes, reports, videos, and sketches (Alsalm, 2021).

The level of M utilization and acceptance among Saudi teachers remains low and difficult, as it is linked to technology performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), attitudes, and competence (Garone, et al., 2019; Alasmari, 2022; Lutfi 2022). The teachers' attitude and competencies to effectively handle computer-related technology have become crucial for successfully adopting M technology at all levels of education in Riyadh (Binyamin, et al., 2020). Garone et al. (2019) found issues linked to UTAUT factors, including PE, EE, SI, FC, and attitude. Furthermore, Alsaleh (2019) showed that teachers are highly satisfied with new technology adoption.

In the meantime, there is no study yet to examine the influence of teachers' PE, EE, SI, FC, attitude, and competence to use M towards the utilization of M LMS in Riyadh schools. Based on these knowledge gaps, there is a need to further examine the factors influencing levels of utilization and adoption of M among teachers in public schools in Riyadh. This study focuses on three major objectives: (i) to determine the PE, EE, SI, FC, attitude, competence to use M, and M utilization of teachers in Saudi public schools in Riyadh. (ii) to determine whether PE, EE, SI, FC, attitudes, competence to use M, and behavioral intention significantly influence the utilization of M among teachers in Saudi public schools in Riyadh. (iii) Determine whether PE, EE, SI, FC, attitudes, M competence, and behavioral intention have a significant influence on M utilization among teachers.

Based on these objectives, these research questions have been formulated as follows: (i) What is the level of M utilization among the teachers in Saudi public schools in Riyadh (PSSR)? (ii) What is the PE of utilizing M among the teachers in PSSR? (iii) What is the EE of M utilization among teachers in PSSR? (iv) What is the SI of M utilization among teachers in PSSR? (v) What is the FC for M utilization among teachers in PSSR? (vi) What is the attitude towards M usage among teachers in PSSR? (vii) What is the competence to use M in M utilization among the teachers in PSSR?

## 2. literature review

Users' expectations of how a system will help them perform are reflected in their PE. It's crucial because users need to know that using the system will help them perform better in specific tasks (Funmilola, et al., 2019). The mental process of making a decision is the subject of expectation theory. Individuals act in a particular way because they are motivated to choose one behavior over another (Onaolapo & Oyewole, 2018). Studies have found that PE is the most important factor influencing LMS usage (Wilhelm, et al., 2019).

Effort expectancy is determined by the overall ease of accessing a particular system. It denotes how users perceive the ease of using technology to make their lives easier. As users become more comfortable with new technology, their expectation of effort decreases (Dong, 2019). According to Do Nam Hung et al. (2019), teachers would use new technology if it is simple and requires less effort. Users will often ignore any ambiguous system.

Teachers are more likely to use new technology if others encourage them, implying that SI is a factor (Singh, et al., 2020). One of the most important factors in adopting new technology is SI (Pangaribuan & Wulandari, 2018). Apart from the influence of other students, families, and social actors, teachers remain the most significant driver of students' attitudes toward using or avoiding technology in a classroom (Dong, 2019).

FC's role in improving acceptance and LMS usage has been reported in various contexts. Teachers are more likely to use new technology if they know they can get help if they run into problems (Peñarroja, et al., 2019). On the other hand, FC has a moderating effect on the desire to use e-learning (Bervell & Arkorful, 2020). Examples of FCs include the lack of access to technology, infrastructure, and technical support.

Teachers' attitudes toward using new technology greatly impact how they use technology (Pangaribuan & Wulandari, 2018; Seufert et al., 2021). According to Heyder, et al. (2020), the level of satisfaction among users is an effective way to judge the usefulness of technology. Satisfaction also aids in determining whether or not a specific technology will be continued in any field. Consumer attitude, particularly cognitive attitude, influences how they accept an information system, according to Onaolapo & Oyewole (2018). As a result, it's an important factor to consider when evaluating how people use information systems. Teachers must have a positive attitude toward LMS to ensure it can be integrated into the teaching process (Tenekeci & Uzunboylu, 2020).

In the context of education, competence is critical for technology adoption. A lack of technical competence is one of the primary reasons teachers refuse to incorporate new technology into their teaching practices (Casillas Martín et al., 2020). It has a direct impact on teachers' use of technology. Technological competence is an important factor in determining the rate of technology adoption (Umrzokova & Pardaeva, 2020). Computer and internet skills are important in Saudi Arabia for using the internet for educational purposes (Algahtani, 2017). In this light, basic computer hardware and software skills are required to handle technology effectively, but they are also required to use technology (Tenekeci & Uzunboylu, 2020).

Behavioral intention demonstrates that a person will participate in specific activities or chores if they intend to be involved with them. The behavioral intention, in terms of technology use, is the user's intention to utilize technology (Sánchez-Prieto, et al., 2017). Behavior intention is important for learning development because it explains how new actions are acquired and habits form. Behavioral intention considerations can potentially influence the utilization of an LMS. According to UTAUT, there is a substantial link between PE, FC, EE, and behavioral intention (Garone, et al., 2019).

### **3. METHODS**

#### *3.1 Conceptual Framework*

The UTAUT and TAM models are used in this research. It investigates the behavioral intentions of public-school teachers in Riyadh to use M LMS. Figure 1 illustrates the UTAUT and TAM models. These models serve as the foundation for the conceptual framework. The UTAUT assesses PE, EE, SI, and FC.

In contrast, the TAM assesses attitude toward using M LMS and competence in using M LMS as influenced by behavioral intention, which is thought to impact teachers' behavior and M LMS use in Riyadh. PE, EE, SI, FC, attitude, and competence are the independent variables in this framework, while utilization of M LMS is the dependent variable. The study's primary target group is public school teachers in Riyadh, Saudi Arabia.

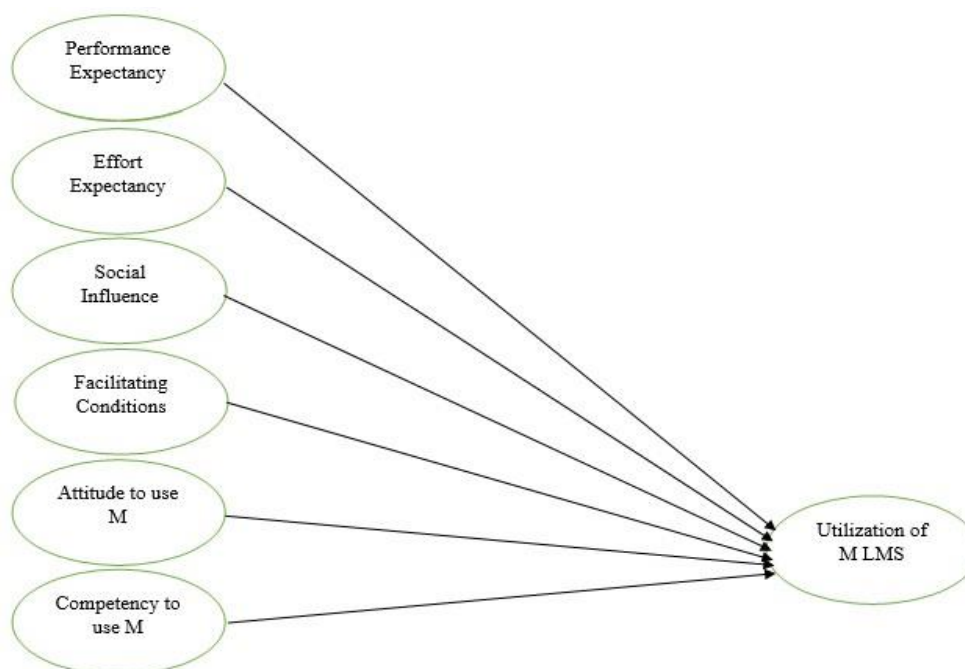


Figure 1. Conceptual Framework

Based on this framework, it can be hypothesized that

- H<sub>1</sub>: There is a direct effect of PE on M utilization among teachers.
- H<sub>2</sub>: EE directly affects M utilization among teachers.
- H<sub>3</sub>: There is a direct effect of SI on M LMS utilization among teachers.
- H<sub>4</sub>: There is a direct effect of FC on M utilization among teachers.
- H<sub>5</sub>: There is a direct effect of the attitude to use M on M utilization among teachers.
- H<sub>6</sub>: There is a direct effect of competence to use M on M utilization among teachers.
- H<sub>7</sub>: There is a direct effect of behavioral intention on M utilization among teachers.

### 3.2 Research Design

The survey method was used to determine the factors (PE, EE, SI, FC, attitude to use M LMS, and competence to use M LMS) influencing teachers' behavioral intentions toward M LMS use in Saudi public schools in Riyadh using a quantitative research design. The main reason for using this method is that quantitative research takes a more scientific approach to dealing with human samples and examining relationships' causes and effects.

### 3.3 The population of the study

Riyadh has a population of over 7.5 million people and a general literacy rate of 95.32 percent. The annual growth rate is 7.84 percent (Peterson, 2020). The sample is representative of the general population, allowing the findings of the study to be applied to a larger population. The study's target population is teachers in public middle and secondary schools in Riyadh, Saudi Arabia, who use the Madrasati online learning approach. According to M LMS administrators and management, 13,782 public school teachers in Riyadh use Madrasati in all phases, representing the study's population. Using Cochran's formula (Raosoft® software), the sample size for this study was determined to be 374 samples. Teachers in Riyadh's public schools were chosen based on their qualifications.

### 3.4 Sample and sampling technique

While a sample size of 374 was sufficient to test the hypotheses for this study, 500 survey questionnaires were randomly distributed to the target respondents online. The researcher chose to oversample in anticipation of issues such as sampling errors or unwillingness to complete the questionnaires by potential participants. Out of the 500 questionnaires that were sent out, 425 people responded. The completed questionnaires were then screened before data analysis to find missing data. It was found that 12 responses contained errors and incomplete values. Thus, only 413 complete questionnaires were retained for data analysis, resulting in a response rate of 85 percent. Pallant (2013) claimed that a 60% rate of return is sufficient for analysis and research.

### 3.5 Instrumentation

The survey method was used in this study. Questionnaires as a survey instrument were used to collect data from the participants. The survey questionnaires in this study used a 5-point Likert scale, which is the most widely used instrument in quantitative research on technology adoption and e-learning (Ziraba, et al., 2020). On a five-point rating scale, respondents were asked to express their agreement or disagreement with each statement in each item, including 1 to 5. 1 = Strongly Disagree; 2 = Disagree; 3 = Undecided; 4 = Agree; 5 = Agree Strongly.

Copies of the questionnaire were sent to all targeted teachers in public schools adopting Madrasati in Riyadh, Saudi Arabia, through Google Forms. All teachers received emails that included a consent letter and a direct link to the survey. As teachers typically have less time to access their email on weekends, the survey was distributed during school hours and at an appropriate time (respondents' free time). A cover letter and consent form were sent together with the survey questionnaires.

### 3.6 Reliability and Cronbach's alpha ( $\alpha$ )

The Cronbach's alpha test was used to determine the internal consistency of each variable. According to Hayes & Coutts (2020), 0.7 is a satisfactory reliability coefficient. In this regard, PE ( $\alpha=0.730$ ), EE ( $\alpha=0.867$ ), SI ( $\alpha=0.878$ ), FC ( $\alpha=0.846$ ), BI (0.835), attitude (0.861), and Competence to use M LMS (0.968), all show high and satisfactory reliability, while competence has the highest reliability ( $\alpha=0.968$ ) followed by attitude ( $\alpha=0.878$ ). This result demonstrated that each of the six variables is reliable. Their reliability values exceeded the recommended threshold of 0.700, allowing Cronbach's Alpha statistics to be used to analyze the data.

### 3.7 Data Analysis

The Statistical Package for Social Science (SPSS, version 23) was used to analyze the quantitative data in this study. The data was descriptively analyzed to obtain the percentages, means, and standard deviations. The significance level was set at  $p < 0.05$  for all variables. All of the responses were double-checked for missing data and outliers, and only 413 responses were retained for further analysis. The data was also entered into AMOS v23 to test the proposed hypotheses using Structural Equation Modelling (SEM). According to Morin et al., the dataset was analyzed in three stages using AMOS: confirmatory factor analysis (CFA), measurement model analysis, and structural model analysis (2020). Skewness and kurtosis were used to determine data normality; the skewness ranged from -0.038 to 1.506, and the kurtosis ranged from -1.506 to 1.506.

## 4. Results

Table 1 shows the demographic information of the teachers. According to the findings, females account for 51.33% of respondents, while males account for 41%. (48.67%). Around 27.36% of the respondents are under 30, while 21.79% are between 31 and 40. The highest percentage (29.54%) is between the ages of 41 and 50, while the lowest percentage (21.31%) is 51 years or older (Table 1). Table 1 shows the participants' academic qualifications, with the highest number of respondents (84.50%) having an undergraduate degree and the remaining (15.50%) having a postgraduate degree.

The length of service, specifically years of employment, determines the respondents' experience. The majority of respondents (40.92%) had 8–14 years of experience.

Table 1. Demographic distribution of the respondents

Demographic variable	Category	Percentage
Gender	Male	48.67
	Female	51.33
Age	30 years old and less	27.36
	31-40 years old	21.79
	41-50 years old	29.54
	51 years old and above	21.31
	Education Level	Undergraduate
	Postgraduate	15.5
Experience (years)	7 years and less	15.25
	8-14 years	40.92
	15-21 years	19.85
	22-28 years	17.19
	29 years and above	6.78
How many workshops have you attended in the last year?	One workshop	27.12
	Two workshops	18.89
	Three workshops	16.95
	More than three workshops	37.05

#### 4.1 Level of M LMS utilization

PE, EE, SI, FC, attitude to use M LMS, and competence to use M LMS influence M LMS utilization outcomes among Riyadh teachers, set the foundation for this study's findings.

##### 4.1.1 Performance Expectancy

PE's result is shown in Figure 1. Regarding the first hypothesis, the PE2 had the highest agreement rate of 196 (m = 3.77). PE5, on the other hand, had the lowest frequency (m = 3.72). This indicated that a large number of respondents agreed that M LMS facilitates their learning. As a result, M LMS use is beneficial in course teaching. Thus, the hypothesis is accepted. Moreover, most respondents discovered that their PE toward using M LMS benefited their professional career development and work performance.

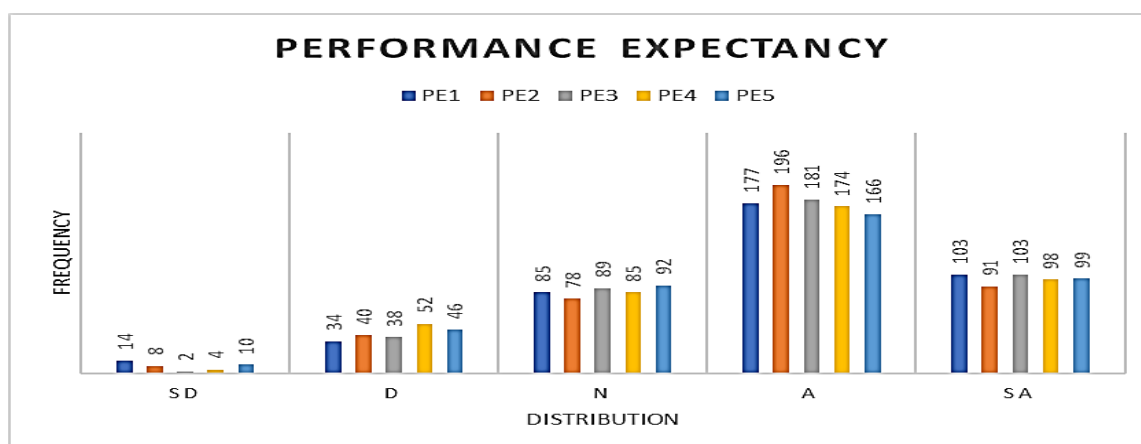


Figure 1. The results of performance expectancy. SD: Strongly Disagree, D: Disagree, N: Natural, A: Agree, SA: Strongly Agree.

#### 4.1.2 Effort Expectancy

The outcome of the second hypothesis is depicted in Figure 2. The EE5 has the highest agreement frequency with 179 (m = 3.99), while the EE2 has the lowest at 145 (m = 3.72). The result indicates that although implementing M LMS is a time-consuming process, some teachers believe the system is user-friendly enough. As a result, this theory was accepted.

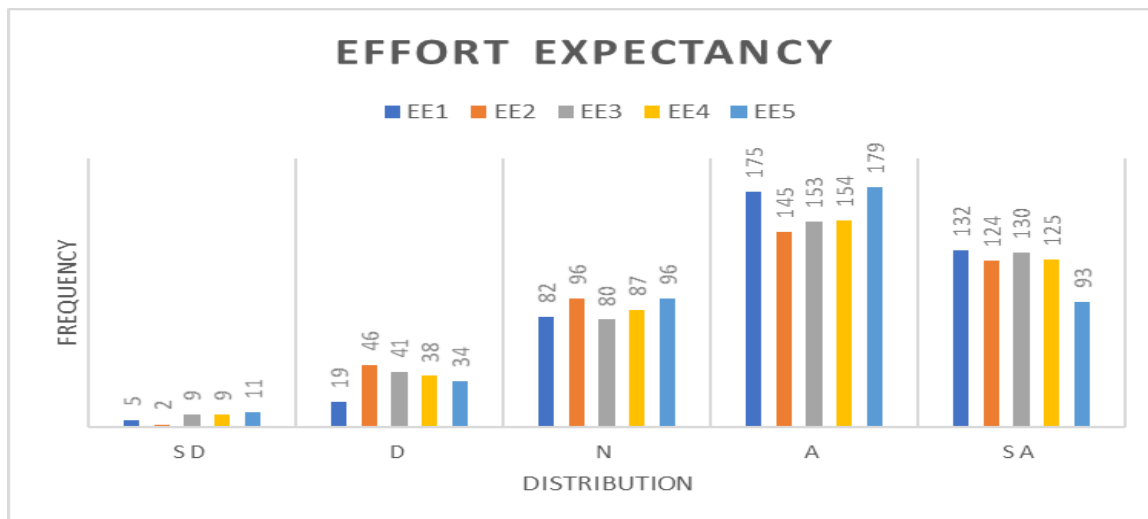


Figure 2. The results of effort expectancy. SD: Strongly Disagree, D: Disagree, N: Natural, A: Agree, SA: Strongly Agree.

#### 4.1.3 Social Influence

The SI result for the third hypothesis is shown in Figure 3. SI1 and SI2 scored the highest agreement rate (m = 4.01), indicating that being the first to use the M LMS is a source of pride. SI13 has a lower frequency with 184 (m = 3.75), with M LMS users demonstrating a higher social status among their peers. This result reveals that the SI has a strong relationship with M LMS usage. As a result, the third hypothesis was accepted.

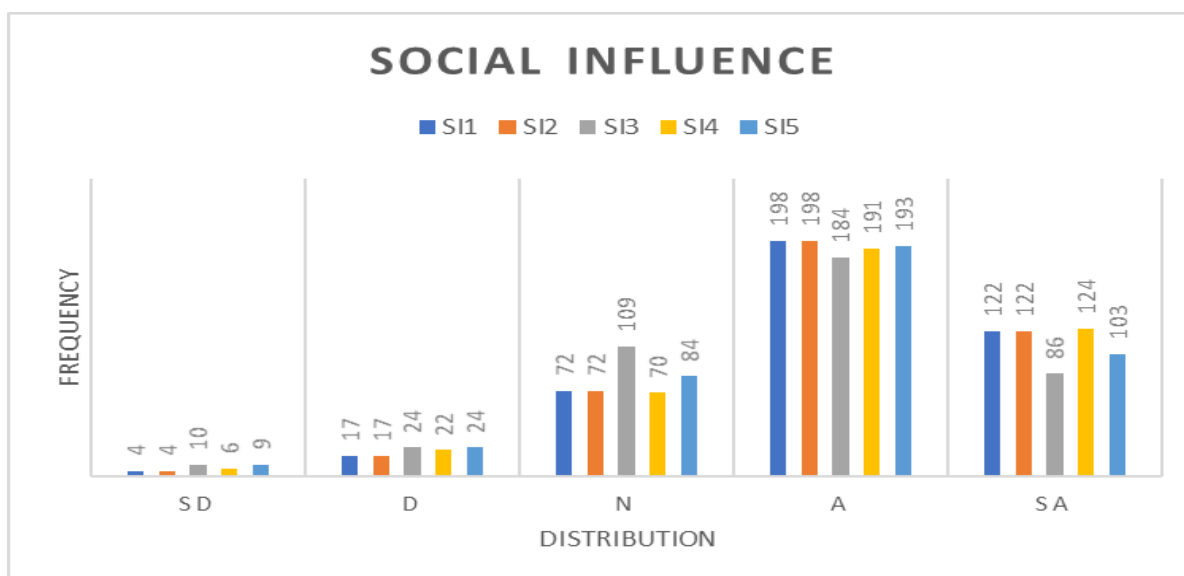


Figure 3: The results of social influence. SD: Strongly Disagree, D: Disagree, N: Natural, A: Agree, SA: Strongly Agree.

#### 4.2 Facilitating Conditions

The result of FC regarding the fourth hypothesis is shown in Figure 4. FC1 had the highest frequency of 216 ( $m = 3.67$ ), whereas FC4 had the lowest (164). This suggests that one of the most important factors impacting teachers' use of M LMS was FC. This result revealed that a school's deployment of essential infrastructure had a positive impact on M LMS usage.

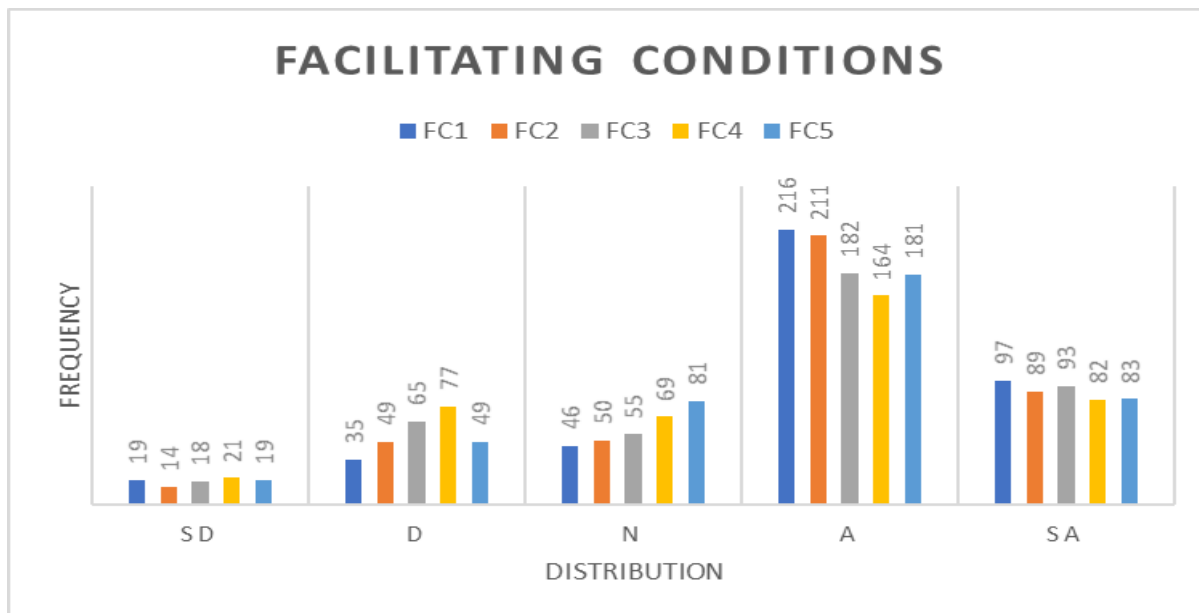


Figure 4. The results of facilitating conditions. SD: Strongly Disagree, D: Disagree, N: Natural, A: Agree, SA: Strongly Agree.

##### 4.2.1 Attitude to use M LMS

As indicated in the fifth hypothesis, figure 5 depicts the outcome of the attitude test. The agreement is highest with ATT1 at 171 ( $m = 3.62$ ), and the lowest score is for ATT11 at 338 ( $m = 3.38$ ). This shows that respondents perceive the LMS as not user-friendly and complex. Moreover, the respondents think that learning to use it would take a long time. Finally, according to the teachers, M LMS implementation is time-consuming. As a result, the fifth hypothesis was rejected.

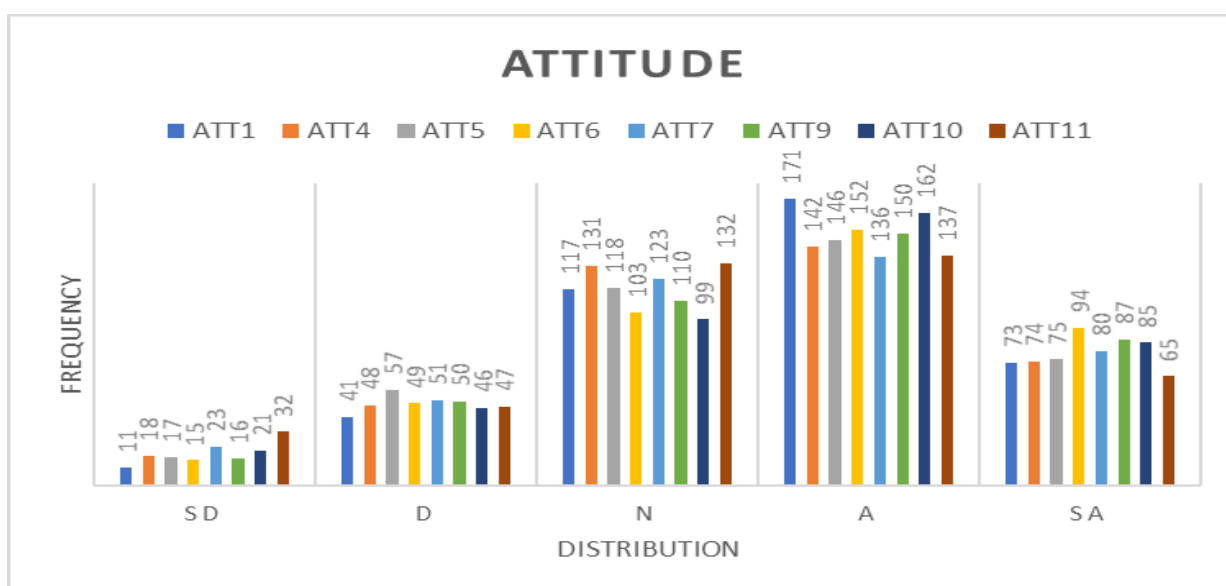


Figure 5. The results of attitude. SD: Strongly Disagree, D: Disagree, N: Natural, A: Agree, SA: Strongly Agree.



#### 4.2.2 Competence in using M LMS

The result of the competence test in connection to the sixth hypothesis is depicted in Figure 6. According to the results, COM10 had the highest frequency of 218 ( $m = 4.00$ ), while COM15 had the lowest frequency of 178 ( $m = 3.87$ ). Most teachers accept (agree) that the M LMS can offer relevant information and content. Well-designed courses and useful feedback boost teachers' knowledge and are part of the COM toward M LMS usage. As a result, the sixth hypothesis has been accepted.

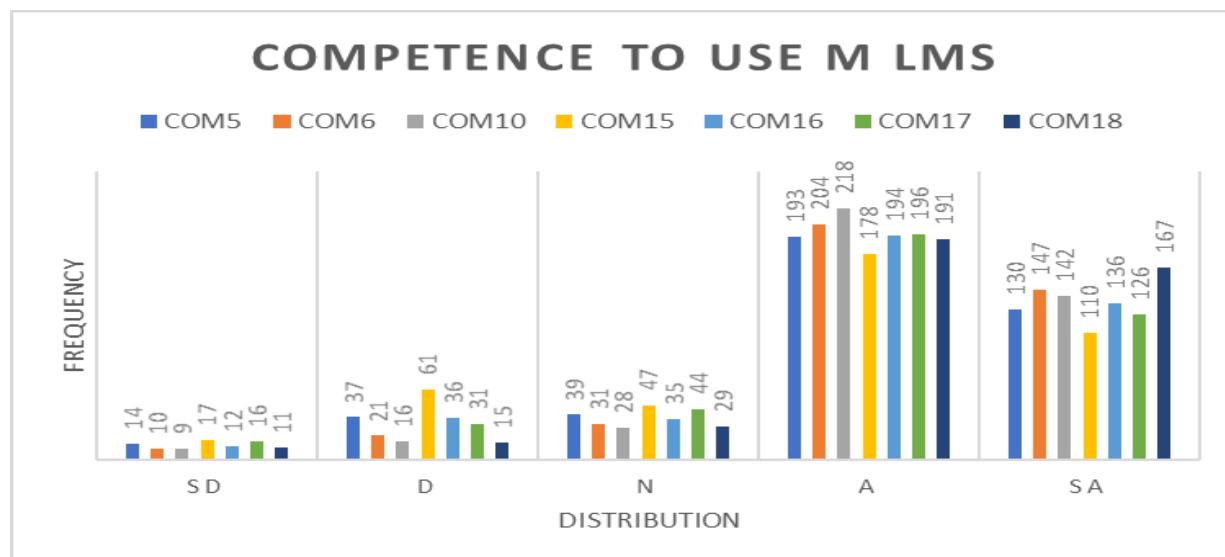


Figure 6. The results of competence to use M LMS. SD: Strongly Disagree, D: Disagree, N: Natural, A: Agree, SA: Strongly Agree.

#### 4.2.3 Behavioral Intention

The result of the competence test in connection to the sixth hypothesis is depicted in Figure 6. According to the results, BI13 had the highest frequency of 213 ( $m = 4.00$ ), while BI15 had the lowest frequency of 183 ( $m = 3.76$ ). This fact demonstrates that teachers' behavioral intentions play a substantial role in determining the use of M LMS. The results show that the instructors' greatest mean value has been linked to their eagerness to attend training sessions to learn more about how to utilize M LMS in depth. As a result, the sixth hypothesis is now considered valid.

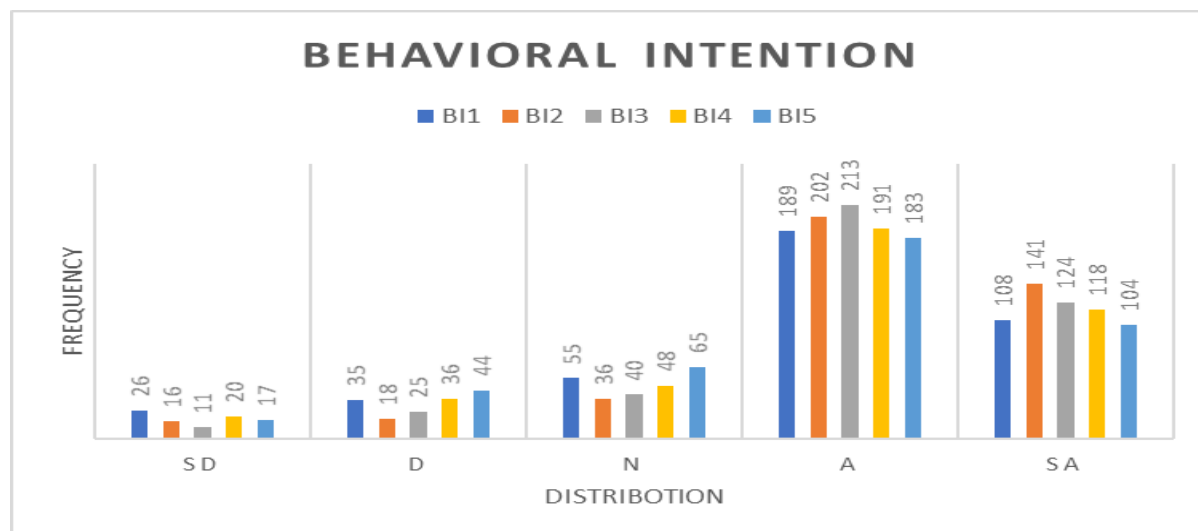


Figure 7. The results of behavioral intention. SD: Strongly Disagree, D: Disagree, N: Natural, A: Agree, SA: Strongly Agree.

## 5. Discussion

This study investigates Madrasati (M) LMS's utilization among teachers in Saudi public schools in Saudi Arabia. These factors include the level of PE, EE, SI, FC, attitudes, competence to use M LMS, and behavioral intention. This study's findings regarding the level of PE utilization in Riyadh revealed that the PE construct has a positive and significant effect on M LMS. Saudi Arabian teachers' M utilization and acceptance levels appeared to be linked with the technology PE. Although the level of M utilization among teachers remains challenging in Saudi Arabia, their behavioral intention entails the teachers' PE toward new technology (Alkinani & Alzahrani, 2021). EE was discovered to have a considerable impact on M LMS use. This indicates that Riyadh teachers found the M LMS simple to use and adapt. Teachers employ new technology if it is simple to use and needs less work, according to Ling et al. (2020). This is because an ineffective system causes users to lose interest and alter their perception.

SI significantly affects M LMS utilization. Hence, it positively affects how teachers socially interact with M technology. According to Permana & Kustiawan (2022), teachers use new technology if they are encouraged and it helps them socially impact others. The considerable effect identified in this study is confirmed by Dong's (2019) findings, which found that instructors were more willing to adopt technology if they believed it would boost their social value. Moreover, Singh et al. (2020) asserted that institutional encouragement provides a degree of SI, providing that students and teachers must be active users and supporters of technology (Setyahadi & Dewi, 2019).

FC was found to significantly affect M LMS utilization among public schools in Riyadh. This result implies that FC has a role in enhancing acceptance and LMS utilization. Subsequently, the M LMS will receive more technical support. A lack of excellent technical assistance has been found to significantly impact M LMS adoption in Saudi Arabia (Funmilola, et al., 2019). A crucial component that enables FC in Riyadh is the availability and quality of technical support. Furthermore, the results revealed that FC has an effect on M's intention to employ the technology dependent on the enabling conditions. With the results obtained in the current study, it can be suggested that FC has a positive and significant effect on M LMS utilization in Riyadh.

However, teachers' attitudes do not affect M LMS adoption as the statistic is insignificant. With this outcome, it can be concluded that attitude has no significant effect on M LMS. This suggests that M utilization and acceptance among Saudi teachers cannot be associated with their attitudes. According to the current data, teachers' perceptions toward M use as a new technology are unrelated to their attitude. The success of M utilization in Saudi Arabian public schools is not dependent on the attitudes of Saudi teachers toward its use. As a result, the results can be attributed to the fact that utilization was not accompanied by attitude. In this case, both these distinct matters will have opposing consequences. Another issue is that some KSA teachers are hesitant to adopt M LMS because they fear the technology will clash with their micro-and macro-performance and expectation cultures (Masmali, 2020). This technology improved teaching effectiveness and teachers' comprehension of instructional content, but not their attitudes.

The level of M LMS utilization was found to have a significant influence on competence to use M. The teachers' competence to effectively handle computer-related technology has become crucial for the successful implementation of new technology at all levels of education in Riyadh. According to Alghamdi and Holland (2020), teachers are a big success in efficiently integrating technology into teaching, and their competence in delivering the essential instructional materials is crucial for the level of M LMS adoption and utilization. Competence can affect the teacher's transmission of instructional knowledge to the learners, according to Chi et al. (2020) and Nilsson (2018). The current finding is supported by a report by Chi et al. (2020) which indicates that digital teaching competence measures teachers' perceived level of competence, which influences personality development among teachers.

The findings of this study revealed that teachers' behavioral intentions influence M usage. When teachers use technology like M LMS regularly, their perception of how important technology could

boost their job performance will become more positive. On the other hand, teachers with no intention of adopting technology may regard it as less beneficial, useless, and unimportant. The findings indicate that behavioral intent to complete a task can be translated into PE. This finding is similar to that of Bervell & Arkorful (2020), who found that behavioral intention mediated PE towards technology use.

## 6. Conclusion and Recommendations

### 6.1 Conclusion

This study revealed that levels of M LMS utilization among teachers in Saudi public schools were significantly affected by factors including PE, EE, SI, FC, competence to use M, and behavioral intention. However, the attitude has an insignificant effect on M LMS utilization. This suggests that the success of M utilization in Riyadh public schools is not dependent on the attitudes of Saudi teachers toward its use. This study observed factors influencing levels of Madrasati adoption and utilization in Riyadh.

### 6.2 Recommendations

Future studies should focus on improving PE, EE, SI, FC, competence to use M, and behavioral intention factors and other factors concerning behavioral intention, such as flexibility in using Madrasati technology, interactions with the Madrasati, and ease of use.

The usage scale employed in this study was based on a subjective manner in which the teachers' perceptions of the actual utilization were described. The system's tracking capabilities can be used to determine the number of times teachers log on to the system and the frequency with which the system's tools are utilized in order to assess the real utilization objectively. This is recommended for further investigation.

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