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Technology Acceptance Model to Determine the influence of Faculty Member Experiences of Utilizing LMS

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Abstract

This study aimed to measure the differences between the attitudes of King Saud University academics based on their expectations before they use the learning management system since the outbreak of the COVID-19 pandemic and after attaining their experience through practice. The sample individuals are 86 as a pre-sample and 85 as a post-sample. TAM2 model staff were used to build the data collection tool and link the impact of variables (sex, specialization, scientific rank, training duration and use). The results showed that cumulative experiences play a crucial role in creating a meaning of orientation and practice in connection with the actual use of techniques. It also shows that practice, according to long periods of experience in the uses of technology in the educational process, provides a more realistic measurement that is different from the opinion of any sample at the beginning of its use of technology in its initial stages. There were statistically significant differences in favour of the pre-sample about their high acceptance of the system, and they had positive attitudes towards expecting their use. Different attitudes were monitored for the post sample (after experience practicing the system) because of the barriers and difficulties they faced during their activation and use of the system, which negatively affected their attitudes. The study recommended raising cultural awareness and promoting the proper activation of technical tools by conducting more training courses in this field because it impacts the formation of positive accumulative orientation affecting adoption during use.

Keywords: Technology acceptance model, Experience, Practice, LMS, faculty staff, Covid19.

مستخلص:

هدفت هذه الدراسة إلى قياس الفروقات بين توجهات أكاديميين جامعة الملك سعود بناءً على توقعاتهم قبل استخدامهم لنظام إدارة التعلم منذ بدء جائحة كورونا وبناء على خبراتهم بالممارسة، وكانت فترة جمع البيانات على امتداد ٣٨ أسبوع من استخدامهم للنظام (ثلاث فصول دراسية). تبنت الدراسة المنهج الوصفي التحليلي المقارن comparative methodلتحقيق أهدافها؛ تم استخدام اركان نموذج تام Tam2لبناء أداة جمع البيانات لتحقيق هدف الدراسة، وبحث أثر متغيرات (الجنس– التخصص– الرتبة

العلمية– مدة التدريب والاستخدام) ربطا بالأركان. تكون أفراد العينة من (٨٦) كعينة قبلية و(٨٥) كعينة بعدية. اظهرت اهم النتائج أن الخبرات التراكمية لها دور كبير جداً في تكوين معنى الاتجاه والممارسة ربطًا بالاستخدام الفعلي للتقنيات، وأن الممارسة وفق الخبرات لفترات طويلة في استخدامات التقنية في العملية التعليمية تعطي قياس أكثر واقعية يختلف عن رأي أي عينة في بدايات استخداماتها للتقنية في مراحلها الأولية، حيث وُجدت فروق ذات دلالة إحصائية لصالح العينة القبلية (قبل الاستخدام الفعلي) حول تقبلهم العالي للنظام، وكان لديهم توجهات ايجابية نحو توقع استخدامهم، في حين تم رصد توجهات مغايرة للعينة البعدية (بعد الخبرة بالممارسة للنظام) لما وجدوه من عقبات وصعوبات واجهتهم اثناء تفعيلهم واستخدامهم للنظام مما اثر على توجهاتهم سلباً. أوصت الدراسة برفع درجة الوعي الثقافي وتعزيز التفعيل الصحيح لاستخدامات الأدوات التقنية من خلال عقد المزيد من الدورات في هذا المجال لما له تأثير في تكوين توجهات تراكمية إيجابية تؤثر على التبني، كما تؤكد الدراسة على أهمية الشروع بمحاولة بناء خبرات إيجابية تراكمية مبنية على تحليل للخبرات الحالية للاعضاء من قبل العمادات المعنية وذلك لاستغلال الممارسات والتي اكتسبوها الأعضاء لاستمرارية استخدام التقنية في العملية التعليمية بكفائة وتأثير إيجابي فعال.

الكلمات المفتاحية: *نموذج قبول التكنولوجيا، الخبرة، الممارسة، نظام إدارة التعلم، أعضاء هيئة التدريس، كوفيد ١٩.*

1. Introduction

The outbreak of the COVID-19 epidemic swept through the barriers of time and space, calls for "distance learning" and "eLearning", and swept through the barriers of space and time, which necessitated all educational sectors in the world's various institutions in general and Saudi Arabia in particular, changing their strategies and looking for alternative approaches to sustain their work. eLearning and learning management systems LMS mainly rely on the most important and diverse tools' technologies that assist and support the educational process and contribute to its transformation from indoctrination to creativity, skills development, and interaction (Al-Maliki et al, 2023; Khafaga 2021). Therefore, the LMS needed to adopt the "blackboard" or activate its use to help sustain the educational process in university learning institutions. Indeed, most universities have used open or closed-source eLearning management systems to provide educational grounds for faculty members and academics to easily teach and communicate with learners without needing deep knowledge of programming methods (Buthelezi and Van Wyk 2020; Al-Maliki, 2023)

Studies have shown that faculty members' attitudes and acceptance of technology are critical factors in the success of technology adaptation. This is confirmed by the TAM2 technology acceptance model, which states that the more the viewer sees the technology as practical and perceive ease of use, PEOU the more positive their orientation towards it (Eraslan Yalcin and Kutlu 2019). The more difficult it is to use, the more negative their orientation towards use. These attitudes may be affected by the practice of technology because of going through many positive or negative experiences (Bervell and Umar 2020; Mtshali et al. 2022). These experiences affect the degree to which beneficiaries accept technology and thus shape their attitudes which may affect their usage

2. Need for study

There may be a lack of workshops and courses by faculty members, which creates a significant challenge in terms of the use of LMS virtual classes academically and masterfully, as the use of technology becoming compulsory. Especially since training plays a major role in strengthening the positive attitudes of users (Alawad and Fathy 2021). According to several variables, this resulted in a difference in faculty members' attitudes towards using the learning management systems i.e. BB. These variables include sex, specialisation, scientific rank, training, and duration of use. That made it essential to measure academic staff's acceptance and attitudes towards their use of technology through the use of the learning management systems LMS i.e. Black Boarded BB in light of the Model TAM2, and the degree to which they experience practice and compare them to their expectations of these attitudes during the COVID-19 pandemic, it gives an opportunity to measure and determine all possible way to evaluation and develop with re-planning the technology guided by the usage of user's experiences and practicing with technology, also identifying how much the member staff been affect by utilizing BB for accepting technology (Wijnen, Walma van der Molen, and Voogt 2021).

This helped identify the barriers and develop the current use situation according to specific variables. This study depends on the answer to the question: what is the degree of change in the orientation of academics towards accepting technology using the learning management system LMS i.e. BB due to Model TAM2 since the beginning of the COVID-19 pandemic? The following questions and assumptions arise from the main question:

- Are there any statistically significant differences about the survey components due to the difference between the attitudes of the sample individuals based on expectations and experience in practice?
- Are there any statistically significant differences about the survey components due to a difference between the attitudes of the sample individuals based on expectations and experience in practice due to variables (gender, specialisation, scientific rank, training, and time of use)?

3. Study hypothesis

Grounded on Model TAM2 and investigating causal relationships and the impact of external variables on the underlying factors of the model, the following assumptions were formulated, there is a statistically significant relationship about the practice of KSU academics' learning management system LMS i.e. Blackboard BB at the 0.05 level between:

- H1: The perceive ease of use PEOU and perceive of usefulness PU.
- H2: The critical mass CM and the perceive of usefulness PU.
- H3: The capability CP and the perceive of usefulness PU.
- H4: The perceive playfulness PP and the perceive of usefulness PU.
- H5: The trustworthiness TW and the perceive of usefulness PU
- H6: The perceive of usefulness PU and the intention to use,
- H7: The perceive ease of use PEOU and the intention to use IU.
- H8: The perceive of usefulness PU and the actual use AU.

4. Theoretical framework and related literature review

4.1 King Saud University, teaching support and LMS during COVID-19 pandemic

King Saud University has sought to support and apply eLearning for various educational programs in the educational process, that was as a part of the strategic attitude of Saudi higher education institutions towards activating eLearning and adopting distance education during the coronavirus pandemic (AlShiraida 2019; Khafaga 2021). The LMS adopted in the universities, during which teaching and approaches are practised as an integrated system responsible for managing the eLearning process via a global network of information "internets", which includes admission and registration, management of courses and duties, follow-up of students' learning (Tyaningsih et al, 2023), supervision of synchronous communication and nonsynchronous tools, test management with arrangement other tools and tasks (Jarah 2020; Wichadee 2015). Moreover, ban attendance at universities caused by covid-19, the eLearning department

of the deanship at KSU has implemented training programs and workshops for the academic community to raise the level of attitude and skill preparation to cope with all the new decisions to complete the university academic year. This requires support and a certain level of ownership of faculty members and those at their rank eLearning skills (Alawad and Fathy 2021; Abdel Ati, 2023). Subsequently, the deanship of eLearning and distance learning at KSU had undertaken many procedures, such as the appointment of an educational designing team of the University Agency for educational and academic Affairs, before Corona in October 2019, as he worked on the design of courses offered remotely in all colleges following QM standards and preparing special guides in educational design.

4.2 Technology acceptance model TAM2

TAM2 developed by Venkatesh and Davis in (1996, 2000), it focused on developing a vision of users due the use of technology and experiences link into their acceptance (Al-Adwan et al, 2023), controlling direct relationship between the user's technology acceptance and the external/internal factors that would impact the effectiveness is essential to support and encourage the technology's' use (Venkatesh and Davis 2000), TAM2 in Figure 1 suggests that any particular technology based on two main factors is accepted: predicted perceive ease of use (PEOU), which means the degree to which a person thinks that using a particular technology will be the least possible effort, in link to that, the perceive of usefulness (PU) means the degree to which a person believes that using a particular technology will assist to improve his or her job performance, and added benefits (Davis, 1989). These two-intermediate belief-based factors affect another factor of their intention to use (IU). It is the force whose motivation and intentions to adopt and use, whether positive or negative, are affected by external factors or variables indirectly through the expected benefit and ease, such as the critical mass (CM), which is used to study the impact of the number of users on the popularity of the use of technology for years. There are also capability (CP), which means studying the impact of computer communications' ability to allow users to communicate and participate in the exchange of information (Granić and Marangunić 2019). Although, perceive of playfulness (PP) means studying the impact of the level of enjoyment in interactive environments provided by the technology acceptance (Eraslan Yalcin and Kutlu 2019), and trustworthiness TW means the impact of the level of security and privacy and therefore the confidence of the technology in the actual to use AU. Therefore, the main objective of the TAM2 is to predict, interpret and identify factors that play an essential

role in accepting or rejecting or impacting a particular information system as factors (Alharbi et al. 2021; Aman et al. 2020; Rauniar et al. 2014; Venkatesh and Davis 2000). Moreover, it been known as an accepted model that has demonstrate relevant in investigating participant's willingness to practicing of use technology.

4.3 Academics' attitudes towards the use of LMS in light of TAM 2

The acceptance of technology is one of the most critical challenges researchers face in studying the integration of technology into the educational process (Marangunić and Granić 2015), it is "one of the most frameworks adopted because of its robustness, simplicity, and applicability in explaining and predicting the attributes that affect user's adoption behavior towards new technologies" (Dumpit and Fernandez 2017:8). Therefore, technology acceptance constitutes the users' attitudes towards their application and activation. Trends are generally defined as an acquired emotional readiness towards a subject and have a significant role in determining human behaviour towards the subject. Attitudes may be positive, negative, or neutral, and previous practices and experiences undoubtedly play a major role in shaping this attitude (Zalat, Hamed, and Bolbol 2021), the TAM2 confirmed this for accepting technology to move towards providing remote electronic learning in emergency and problem-solving resorts (Mufidah, Husaini, and Caesaron 2022). The results revealed that the faculty member's awareness of the ease of use of learning management systems and the perceived benefit of it, despite the difficulties and barriers they face in the actual use of LMS, increase the intensity of their beliefs towards their effectiveness and thus accept them and form positive attitudes towards their activation (Pan et al, 2023; Amahan & Amahan, 2023).

4.4 Impact of faculty members' experience with practicing technology

The use of any new technological innovation such as learning management systems is very demanding and important for faculty members, as indicated by studies, especially when it needs diversities way of adopting educationally (Priyadarshani and Jesuiya 2021; van der Spoel et al. 2020). However, faculty members of different specialisations apply everything new and will reflect positively on the educational process and effective results of change. They are always willing to develop themselves and receive new courses that will raise their performance. This may be acquired emotional preparedness due to a positive attitude towards the activation and application of technology (Mtshali et al. 2022). Most important, faculty members' experience and previous experiences based on practicing with

technology play a crucial role in shaping these reflections i.e. attitudes. Numerous studies have indicated the importance and impact of accumulative experience on the use of technology, considering that the attitudes of most faculty members were negative to those who found it challenging to use LMS as a result of their lack of experience in how to use it, unlike the previous experience of how to use their attitudes were positive towards the use of technology (Alhojailan and Al-Hubaishi 2018; Alqahtani and Alturkey 2018; van der Spoel et al. 2020).

5. The Methodology

The analytical comparative descriptive approach was used, which assist to compare the experiences of faculty members before and after practicing the LMS in teaching, it was 38 week of experience accumulation. The study aims to reach results that measure the value of accumulative experiences between the two phases. This methodology is also effective because it provides an explanatory and complementary addition to the subject matter (Creswell and Creswell 2017). Analysing staff perceptions before and after their experience to identify and measure the impact of diverse experiences during the contingency use of LMS at KSU provides knowledge to identify factors that affect/influence their experiences either negatively or positively by collecting data in two different phases (van der Spoel et al. 2020), the first phase i.e. pre-survey distributed on 5/10/2020 and, the second phase i.e. post-survey distributed on 13/8/2021, 38 week covered three semester of LMS's interactivity and experiences in teaching and learning,

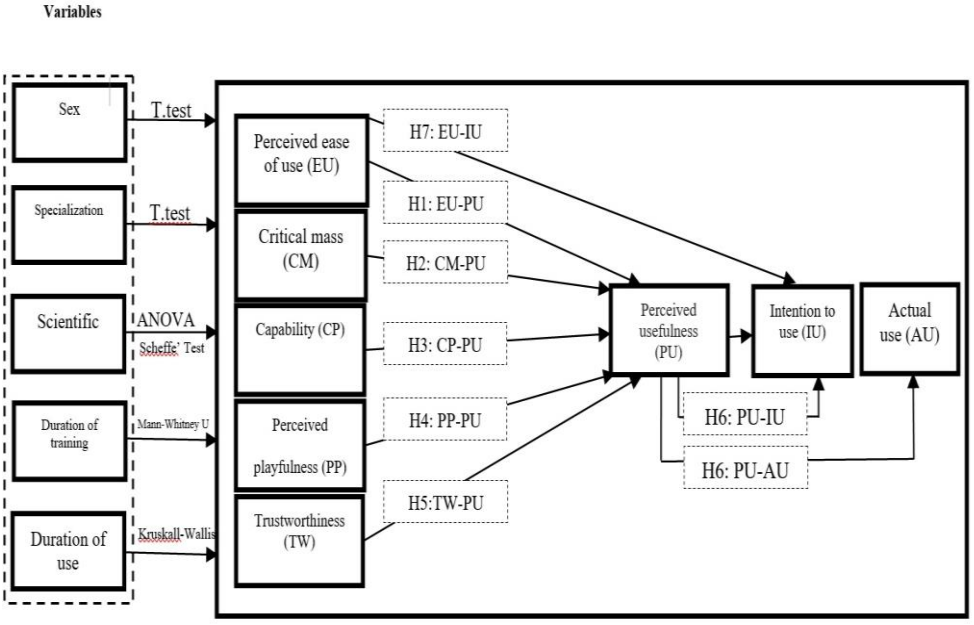
Job-shop production refers to a manufacturing environment that produces goods in small batches according to customer specifications. Usually, one or several types of products are deliverable, while the incoming orders may differ in the design, quantity, process flow, or urgency (Henrich 2005). Flexibility is allowed in terms of switching between machines, methods, and resolving problems in production. Depending on the nature of business, each of the workers hired may need to possess a certain range of skills to handle different tasks or machines, whereas the total number of workers may be adjusted in response to the varying demand. In practice, transferability of permanent workers and recruitment of temporary or contract workers will help make such adjustment feasible, thus admitting of the idea of WOZIP.

5.1 Sampling and population

The study's sample is 171 academics; 86 as a pre-survey and 85 as a post-survey. The numbers of faculty members at KSU is 5060 according to Saudi Press Agency on January 14,2021, i.e., the sample constitutes 3.4%.

5.2 Data collection tool and development

The survey used in this study built by referencing previous literature and studies related to the study subject matter, adapted framework of TAM2 by analysing related studies linked to BB (see Figure 1), The surveys' designed and divided into two main parts: the first addresses the samples' demographic data in Table1, it includes demographic information i.e. sex, age, scientific rank, specialisation, training gained, and time of use and the time of using LMS (Aman et al. 2020; Qteishat, Alshibly, and Al-Ma'aitah 2013), the second part comprised 8 sections with 32 statements (see Table2) describing the use of LMS according to TAM2 Model (Venkatesh & Davis, 1996, 2000), which are as follows: PEOU, PU, CM, CP, PP, TW, IU and AU (Aman et al. 2020; Dumpit and Fernandez 2017; Moon and Kim 2001; Qteishat et al. 2013; Rauniar et al. 2014).



(2)

Figure 1. The study hypotheses and TAM2 model, from (Venkatesh and Davis, 2000; Rauniar et, al. 2014)

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Table 1: Demographic and summary of pre/post-samples

Variable	Categories	Pre-samples		Post-sample	
		No	%	No	%
Sex	Male	33	38.37	40	47.06
	Female	53	61.63	45	52.94
	Total	86	100.0	85	100.0
Ranking	Teacher	6	6.98	5	5.88
	Lecturer	23	26.74	16	18.82
	Assistance professor	29	33.72	33	38.82
	Assassinate professor	16	18.60	21	24.71
	Professor	12	13.95	10	11.76
	Total	86	100.0	85	100.0
Specialist	Sciences	46	53.49	45	52.94
	Huminites	40	46.51	40	47.06
	Total	86	100.0	85	100.0
Training receive	3/Less tanning courses	77	89.53	76	89.41
	4/More training courses	9	10.47	9	10.59
	Total	86	100.0	85	100.0
Using LMS before Covid19	1-2 Times per-semester	33	38.38	40	47.06
	1 Per-week	16	18.6	18	21.18
	Few times per-week	16	18.6	5	5.88
	More than 3 times per-week	15	17.44	14	16.47
	Few times per day	6	6.98	8	9.41
	Total	86	100.0	85	100.0
Using LMS after Covid19	1-2 Times per-semester	13	15.12	15	17.65
	1 Per-week	8	9.3	4	4.71
	Few times per-week	17	19.77	9	10.59
	More than 3 times per-week	23	26.74	26	30.59
	Few times per day	25	29.07	31	36.47
	Total	86	100.0	85	100.0

5.3 Tool validity and stability

Consulate a number of expertise in the field to evaluate the validity of the survey's statements, then the validity of the survey was measured by calculating the correlation coefficient between the values of each survey to the whole degree of the statements, to which the phrase belongs, on a sample of 30 sample individuals, as it is evident in the table that all paragraphs have statistical significance at the 0.01 level. This indicates high indicators of stability, and the value of the alpha coefficient for the entire is 0.94, indicating that the survey is entirely stable. Moreover, Cronbach's alpha coefficients of the constructs used, reliability of the construct is acceptable, ranging from 0.43 to 0.946., as following:

Table 2: Pearson's correlation coefficient between each statements paragraph and the overall value of its items with Cronbach's alpha coefficients

Construct	**Statement**	**Meaning adapted from**	**Pearson's correlation**	**Cronbach's Alpha***
Perceived usefulness				
PU1	Blackboard is useful because it provides communication with students	(Alharbi and Drew 2014)	**0.608	0.829
PU2	Blackboard assist me to do my teaching requirement with students	(Dumpit and Fernandez 2017; Sledgianowski and Kulviwat 2009)	**0.745	
PU3	Generally, blackboard is useful in my academic work	(Dumpit and Fernandez 2017; María-del-Carmen Alarcón-del-Amo 2012)	**0.783	
PU4	Generally, use of Blackboard is useful in the field of learning	(Dumpit and Fernandez 2017; María-del-Carmen Alarcón-del-Amo 2012)	**0.820	
PU5	Blackboard tools (such as discussion board and electronic exams and activities) is effective and useful	(Alharbi and Drew 2014)	**0.880	

Construct	Statement	Meaning adapted from	Pearson's correlation	Cronbach's Alpha*
Perceived Ease of Use				
PEOU1	Blackboard is flexible when interacting in learning	(Fathema and Sutton 2013)	**0.862	0.884
PEOU2	Accessibly with the blackboard is easy to do what I want for educational purposes	(Alharbi and Drew 2014; Fathema and Sutton 2013)	**0.797	
PEOU3	It is easy to become proficient of the use of blackboard in teaching	(Alharbi & Drew, 2014; Ejdys, 2021)	**0.797	
PEOU4	Generally, Blackboard is easy to use in the educational process	(Fathema and Sutton 2013; Padilla-Meléndez, del Aguila-Obra, and Garrido-Moreno 2013)	**0.846	
PEOU5	It is easy in interacting with students via Blackboard	(Fathema & Sutton, 2013; Padilla-Meléndez et al., 2013)	**0.783	
PEOU6	Trying to figure out how to use tools in Blackboard is cumbersome	(Dumpit and Fernandez 2017; María-del-Carmen Alarcón-del-Amo 2012)	**0.726	
Perceived Playfulness				
PP1	I enjoying using Blackboard tools in education process	(Padilla-Meléndez et al. 2013)	**0.737	0.704
PP2	Generally, using Blackboard makes me feel bored	(Sledgianowski and Kulviwat 2009)	**0.632	
PP3	Exploring tools on Blackboard is exciting for me	(Rauniar et al. 2014)	**0.802	
PP4	The blackboard provides enjoyable tools supporting cooperative learning between student	(Padilla-Meléndez et al. 2013)	**0.769	
Intention to use				
IU1	My objective is to use Blackboard in future to	(Alharbi & Drew, 2014;	**0.914	0.853

Construct	Statement	Meaning adapted from	Pearson's correlation	Cronbach's Alpha*
	complete my perform teaching duties	Dumpit & Fernandez, 2017; María-del-Carmen Alarcón-del-Amo, 2012)		
IU2	My objective is to use Blackboard to communicate with student	(Rauniar et al. 2014)	**0.832	
IU3	I will use the blackboard to do an electronic exams and activities for student	(Ejdys 2021)	**0.810	
IU4	I will continue to use Blackboarded in the future after Covid19	(Alharbi & Drew, 2014; Dumpit & Fernandez, 2017)	**0.835	
Actual Usage				
AU1	On the average, how many hours per week do you use blackboard (after Covide)	(Dumpit and Fernandez 2017; Rauniar et al. 2014)	**0.931	0.738
AU2	On the average, how many hours per day do you use blackboard (after Covide)	(Dumpit and Fernandez 2017; Rauniar et al. 2014)	**0.862	
Capability CP				
CP1	The Blackboard technical support provided by university during covid19 was a main reason to use it	(Suresh et al. 2016)	**0.52	
CP2	Technical support is available inside the system of blackboard	(Suresh et al. 2016)	**0.667	0.589
CP3	Blackboard enables you to easily upload and download photos and videos	(Khoa et al. 2020; Padilla-Meléndez et al. 2013)	**0.662	
CP4	Generally, Blackboard capabilities and tools meet my needs in teaching	(Padilla-Meléndez et al. 2013)	**0.662	
CP5	According to the capabilities I found in Blackboard, I will continue to use it in the	(Rauniar et al. 2014)	**0.43	

Construct	Statement	Meaning adapted from	Pearson's correlation	Cronbach's Alpha*
	future after Covid19			
Critical mass CM				
CM1	Blackboard is more popular among university faculty members	(Khoa et al. 2020; Rauniar et al. 2014)	**0.739	0.530
CM2	My colleagues encouraged me to use blackboard	(Dumpit and Fernandez 2017; Sledgianowski and Kulviwat 2009)	**0.561	
CM3	My colleagues prefer to use Blackboard over other programs in teaching	(Dumpit and Fernandez 2017; Sledgianowski and Kulviwat 2009)	**0.859	
TW trustworthiness				
TW1	I trusted to put my personal information on my blackboard profile	(Rauniar et al. 2014)	**0.865	0.946
TW2	I strongly believe that Blackboard is safe against hacking	(Rauniar et al. 2014)	**0.955	
TW3	Blackboard provides security feature for my personal data in my profile	(Rauniar et al. 2014)	**0.975	
TW4	I feel safe from hacking my devices when using blackboard in teaching	(Rauniar et al. 2014)	**0.913	
(*) total= 0.940, (**) significance at level 0.01				

6. Results and discussion

6.1 answering the study questions:

- Q1: Are there any statistically significant differences about the survey component due to the difference between the attitudes of the sample individuals based on expectations and experience in practice?

A T-test was used to extract differences; however, Table 3 illustrates statistically significant differences on each of the three axes (PEOU, PP, IU) use only at the significance level 0.05, however, due to the difference between the pre/post-sample's perception, all of these differences were in favour of the arithmetic means of the pre-survey

individuals, i.e., the expectations before engaged, which reached 22.90, 13.34, 15.35, respectively. The corresponding arithmetic means for the post-survey reached 21.46, 12.54, 14.29, i.e., they are more relevant to the three axes than the post-sample. There are no statistically significant differences about the remaining five axes between the two samples: PU, CM, CP, TW, and AU. This is what the results of this study agreed with Alqahtani & Alturkey (2018), Demmans Epp et al., (2020), Mokhtar et al., (2018) and, Wichadee (2015). The faculty members' awareness of PEOU increases their beliefs towards their effectiveness, thus accepts them and creates positive attitudes towards their practice with LMS (Alfalah, 2023), which was evidenced in the views and attitudes of the post-sample. In fact, their perception changed after practicing and experiencing for 38 weeks, i.e., approximately three semesters, as they were significantly less receptive to the PU, CM, CP, TW, and AU axes. This confirms that, their respond based on their experiences were below their expectations before the practicing, it may result from their low enthusiasm because of the issues and barriers they faced towards applying LMS **(Salama et al, 2023),** whether educational, technical or human aspects, including interaction with providing maintenance.

Table 3: Differences between means of faculty individuals' responses from pre/post-samples around survey components using t-test for two independent samples

Construct	Sample***	Mean	St. Dev	Freedom	T Value	Sig. level
PEOU	Pre	22.90	3.92	169	2.51	*0.013
	Post	21.46	3.55			
PU	Pre	19.94	3.54	169	1.75	0.082
	Post	18.95	3.84			
CM	Pre	9.15	2.5864	169	0.24	0.814
	Post	9.25	2.79			
CP	Pre	18.56	3.73	169	1.60	0.112
	Post	17.64	3.82			
PP	Pre	13.34	2.15	169	2.47	0.014*
	Post	12.54	2.06			
TW	Pre	14.00	3.36	169	0.80	0.424
	Post	13.60	3.17			
IU	Pre	15.35	3.37	169	2.11	0.037*
	Post	14.29	3.18			
AU	Pre	5.93	2.16	169	1.03	0.305
	Post	6.28	2.32			
* Statistical significance at level (0.05), ** statistical significance at level (0.01) *** pre=86, post=85						

- Q2: Are there any statistically significant differences about the survey components due to a difference between the sample individuals' attitudes based on expectations and experiences in their use of technology due to variables (Gender, Specialisation, Scientific Rank, Training and, Time of use)?

The question will be divided in terms of variables as follows:

1. Sex: The t-test used to identify the difference between the arithmetic mean of the pre/post-samples. It became clear that their expectations created statistically significant differences about each of the four axes (PEOU, CP, IU and AU) only at the significance levels 0.01and 0.05 in favour of females; 23.64, 19.53, 16.04, 6.57, respectively, the arithmetic means for the sample group of male faculty members; 21.70, 17.0, 14.24, 4.91, respectively. There were no statistically significant differences between the rest of the four axes (PU, CM, PP and, TW). Additionally, for their perception according to their experiences, there were statistically significant differences on each of the four axes (PU, CM, CP and, AU) only at the significance levels; 0.01, 0.05 in favour of females as well, respectively, 19.84, 10.04, 18.42, 6.93. There are no statistically significant differences over the rest of the four axes (PEOU, PP, TW and, IU). We conclude that most of the differences mentioned above due to the sex change favour females at the sample level.
2. Specialization: It became clear that there were no statistically significant differences about all responses of sample members according to their expectations or experiences on any of the survey components, as the values of all levels of significance were greater than 0.05 at the pre/post-survey level. , means pre/post sample perception have no differences in this regard, which means in this point, the samples' specialist in the university could not consider as a variable would impact the practice of LMS.
3. Scientific rank: ANOVA evidenced the difference in the significance variable at the level 0.05, as their expectations were optimistic about the axis (AU) only. The Scheffe's Test evidenced the source of differences in favour of assistants' professors within the pre-sample. There were no statistically significant differences in the rest of the survey components of the scientific rank variable. Their opinions according to their experiences have created statistically significant differences between the responses of the sample individuals around two axes (PU and AU) only, at the level of significance 0.01 &;

0.05, respectively, while there are no statistically significant differences about the rest of the survey components, where the LSD Test evidenced that the source of differences in favour of professor, assistants and, lecturers.

4. Training: The Mann–Whitney U-test showed that training laboratories had no role in shaping positive attitudes before their actual use of the LMS i.e. they were not enthusiastic about attending training courses since the beginning of the COVID-19 pandemic. There were no statistically significant differences on any of the survey components. All Z values were not statistically significant, with all significance levels greater than 0.05. Their opinions according to their experiences created statistically significant differences around the PEOU axis; with Z, 2.05 and significance level 0.05 in favour of those who attended 4 courses or more with an average rank 58.83 greater than the average ranks of those who attended 3 courses and less 41.13. There were no statistically significant differences about the majority of the remaining axes (PU, CM, CP, PP, TW, IU and, AU), as all significance levels of Z values were greater than 0.05.

This confirms that their attitudes have slightly increased positively and enthusiastically towards attending the courses after using the system and found a critical need for training.

5. Time of use: The Kruskal-Wallis test was used to identify the difference between mathematical averages about the extent to which they used the system according to Form TAM2, which is due to a variable difference in the, as it turns out:

   First: Pre-survey usage time: there are statistically significant differences between sample individuals' responses to most survey components PEOU, PU, PP, IU, CP, AU, and CM at the levels of significance (0.01, 0.05) for those who use LMS permanently and intensively with students daily, i.e. there is a direct relationship for the duration of use and acceptance, except for the trustworthiness axis TW, it may because the compulsory adopting where the member staff have no choices to select the technology.

   Second: Post-survey usage time: It is clear that there are statistically significant differences between the responses of the sample individuals about most of the survey components due to the difference in the variable time of use of LMS for the post sample, except the trustworthiness axis TW, and these differences were

statistically significant about the seven axes i.e. PEOU, PU, CM, CP, PP, IU and AU, at indication levels 0.01, 0.05, in favour of those who use LMS

Based on the above, Table 3 illustrates the comparison of differences between the academics' attitudes of KSU based on their expectations and practicing of experience in using the BB learning management system since the beginning of the COVID-19. This is due to the different primary variables (gender, specialisation, scientific rank, training and time of use) favouring the pre-survey who were eager to apply everything new and would affect the educational process and achieve effective positive results. These actions would result in positive attitudes towards them towards the actual use of the sample using LMS before gaining their experience. However, after an experience of practical practice using the LMS tools in teaching and communication for up to 38 weeks, three semesters, practising build experience has formed different orientations resulting from their encounter with difficulties, obstacles, problems, and negative experiences related PEOU, IU, AU and, CM. Table 4 show the major differences between the post-pre-sampling due to the TAM2 components.

Table 4: Comparing the results of differences about the TAM2 components due to the differences in the initial variables at the level of the pre-post/survey

Variable	TAM2	Pre-sample	Post-sample	Compare between pre/post-sampling
Sex	PEOU	Females		Pre-sample
	PU	Females	Females	Post-sample
	CM	Females	Females	Post-sample
	TW	Females		Differences at pre-survey are greater
	IU	Females		Pre-sample
	AU	Females	Females	Differences at post-survey are greater
Scientific rank	PU		Assistant professors and lecturers more than associate professors & professors	Post-sample
	AU	Assistant professors more than professors.	Assistant professors and lecturers more than participating professors and professors	Differences at pre-survey are greater
Training times	PEOU	Attended ≥ 4 courses		Pre -sample

Variable	TAM2	Pre-sample	Post-sample	Compare between pre/post-sampling
Duration of use of BB before curfews	PEOU	use BB permanently and intensively	Those who use BB permanently and intensively	Differences at pre-survey are greater
	PU	Use BB permanently and intensively	Those who use BB permanently but not/and intensively	Differences at pre-survey are greater
	CM	Use BB permanently and intensively		Pre-sample
	TW	Those who use BB permanently and intensively	Those who use BB permanently but not intensively	Differences at post sample are greater
	PP	Those who use BB permanently and intensively	Those who use BB permanently but not intensively	Differences at post sample are greater
	IU	Those who use BB permanently and intensively	Those who use BB permanently but not intensively	Differences at post sample are greater
	AU	Those who use BB permanently and intensively	Those who use BB permanently and or permanently and intensively	Differences at post sample are greater
	PEOU	Those who use BB permanently and intensively	Those who use BB permanently and or permanently but not intensively	Differences at post sample are greater
	PU	Those who use BB permanently and intensively	Those who use BB permanently and or permanently but not intensively	Differences at post sample are greater
	CM	Those who use BB permanently and intensively	Those who use BB permanently and or permanently but not intensively	Differences at pre-survey are greater
	TW	Those who use BB permanently and intensively	Those who use BB permanently and or permanently but not intensively	Differences at pre-survey are greater
	PP	Those who use BB permanently and intensively		Pre-sample
	IU	Those who use BB permanently and intensively	Those who use BB permanently and or permanently but not intensively	Differences at post-survey are greater
	AU	Those who use BB permanently and intensively	Those who use BB permanently and or permanently but not intensively	Differences at pre-survey are greater

6.2 Secondly, study's hypotheses answered

The following assumptions have been verified at the level of each sample of the pre/post-samples, as shown in Table 4.

- H1: There is a relationship between the PEOU and the PU at the sample level. Pearson's correlation coefficient for this relationship was at their significant level (Pre-sample) 0.73, and slightly greater than the correlation coefficient after their experience of practice (Post-sample), which was 0.71, and the two are at the significant level of 0.01. This indicates the strength of the ejection relationship between them at the sample level (pre/post-sample).
- H2: There is a relationship between the CM and the PU at the level of the two samples, the Pearson correlation coefficient of this relationship at their significant level (pre-sample) 0.55 and slightly less than the correlation coefficient after their experience of practice (post-sample) which was 0.60 and both at the level of significance 0.01 indicating the strength of the direct relationship between them at the sample level (pre/post sample).
- H3: There is a relationship between CP and the PU at the sample level. Pearson's correlation coefficient for this relationship was at their significant level of (pre-sample) 0.73 and slightly less than the correlation coefficient after their experience of practice (post sample), which reached 0.75 and were both at a significance level of 0.01, indicating the strength of the direct relationship between them at the sample level (pre/post-sample).
- H4: There is a relationship between the PP and the PU at the sample level, with Pearson's correlation coefficient at their significant level (pre-sample) 0.60 and almost equal to the correlation coefficient after their experience of practice (post-sample), which was 0.61 and the other at a significant level 0.01, indicating the strength of the correlation between them the sample level (pre/post-sample).
- H5: There was a relationship between the TW and the PU at the significance level (pre-sample) only. Pearson's correlation coefficient for this relationship was 0.47 at the significance level of 0.01. There is a relationship between the TW and the PU at the significant level (pre-sample). Statistically, the relationship between TW and the PU after their experience of practice (post sample) was 0.19 at the significance level of 0.088, greater than 0.05, i.e., which indicates that it is not statistically significant.

- H6: It was found that there was no statistically significant correlation between TW and the PU after their experience of practice (post-sample). It became clear that there was a relationship between the PU and the IU at the level of the two samples. The relationship at their significance level (post-sample) is 0.78, which is slightly greater than the correlation coefficient in the post-survey after gaining experiences of practices, which was 0.61, and the two at a significance level of 0.01, indicating the strength of the direct relationship between the PU and the IU at the pre/post-survey level.
- H7: There is a relationship between PEOU and the IU at the level of expectations and experiences. Pearson's correlation coefficient was at their level of expectations (pre-sample) 0.71, slightly lower than the sample's correlation coefficient after their experience of practice (post sample), which was 0.77, and the two at the significance level 0.01, indicating the strength of the ejective relationship between PEOU and the IU at the pre/post-survey level.
- H8: There is a relationship between the PROU and the AU at the level of expectations and experiences. Pearson's correlation coefficient was at the level of the outlook (pre-sample) 0.46, slightly lower than the correlation coefficient after gaining experiences of practices (post sample), which reached 0.49, and both at the significance level 0.01, indicating the strength of the direct relationship between the PU and the AU at the sample level (pre-survey and post-sample).

These results are consistent with Alqahtani & Alturkey (2018), Annamalai et al., (2022) Binyamin et al., (2019) and,. Binyamin et al., (2019), they demonstrated a relationship between PEOU of the TAM2 with experiences. The use and ease of use of technology positively impacted attitudes towards technology and agreed with the study results (Chen et al.,2020, Khan et al., 2017) that faculty members who had difficulties using the BB system had had negative attitudes towards continuing to use and benefit from it (Elfeky, & Elbyaly, 2023). Moreover, the experiences have impacted their attitude and re-shape their opinion, especially the female member stuff.

7. Recommendation

When analysing similar studies, it is strongly recommending that the attitude investigation and measurements period should be extended, not less than three months of real practices if not more. This means that shaping and directing experience is very important when adopting/judging any technology in education, in this research is LMS, especially in times of

crisis because the used was not by choices. The study recommends conducting studies on the extent to which experience is connected to technology, composition, and accumulation by practice on the attitudes of technology users in education and adopting in-depth studies on identifying the factors that affect this change before and after the construction of experiences and the most important influencing factors.

It is worth mentioning that before and pre-use factors are measured, including intruding factors to influence attitudes. The study also recommends that awareness be taken care of during teaching technology to overcome the effects of negative experiences during use. There should be a reference or educational products for users' inclusive guidance, methods, and eliminating problems.

Declaration of interest statement

The authors declare no conflict of interest.

Availability of data and materials

The datasets been collected and/or analysed in current study are available from the author on reasonable request.

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