JUTLP
Journal of University Teaching & Learning Practice

Recontextualising the Unified Theory of Acceptance and Use of Technology (UTAUT) Framework to higher education online marking

Anabela Soares[a], Moya Lerigo-Sampson[a], Jacqueline Barker[a]
[a] University of West of England, UK.

Abstract

The Higher Education (HE) sector has faced an exceptional period of complex and fast-moving change, meaning staff have had to quickly adjust their teaching delivery, reconsider how learning outcomes are assessed, and adopt new technologies. Despite significant efforts by HE staff across these areas, the willingness to adopt new tools and technologies is not consistent across all staff cohorts and indeed some researchers suggest that this willingness, or readiness to adopt emerging technologies and educational tools can be shaped by individual differences, attitudes, and social norms.

This study focuses on education technology acceptance in HE via a specific university and explores the use of technology enhanced feedback and marking tools, such as online embedded rubrics. Underpinned by the unified theory of acceptance and use of technology (UTAUT), this research project aims to explore the perceptions of staff towards online feedback and marking practices. In turn, the research project considers the relevancy of the UTAUT model in differing / current contexts. Contribution manifests through a) the methodological choice of qualitative semi-structured interviews to explore the UTAUT dimensions, b) the deep contextual understanding of the challenges HE staff face in adopting and implementing new technologies, c) suggested adaptations to UTAUT, and c) recommendations for HE practice.

Keywords: Unified Theory of Acceptance and Use of Technology (UTAUT), Higher Education, Learning Management Systems, Rubrics

Editors

Section: Special Issue
Senior Editor: Dr Cassandra Colvin
Guest Editor: Dr Mike O'Dea

Publication

Received: 30 December 2023
Accepted: 20 August 2024
Online First: 1 October 2024
Published 8 January 2025

Citation

Soares, A., Lerigo-Sampson, M, Barker, J. (2024). Recontextualising the Unified Theory of Acceptance and Use of Technology (UTAUT) Framework to higher education online marking. *Journal of University Teaching and Learning Practice*, *21*(8) https://doi.org/10.53761/7ft8x880

Introduction

The pervasive nature of technology developments has become apparent in higher education (HE) institutions (Granić, 2022). However, technological innovations introduced in educational settings are not always well received and adopted by the stakeholders involved (Granic and Marangunic, 2019; Scherer et al., 2019; Matarirano et al., 2021; Duman and Oğuz, 2024). This might be due to individual beliefs, sociocultural characteristics, motivations, previous technology exposure, and readiness, all of which have been shown as significant factors affecting teachers' adoption of technology (Rogers, 2000; González, 2010; Al-Nuaimi and Al-Emran, 2021; Sherer et al., 2021). Consequently, understanding the perspectives of all stakeholders when technological change is implemented is fundamental, particularly in educational settings where often those technological changes may compromise, affect, or disrupt student learning journeys (Zwain, 2019; Alharbi, 2023; Devisakti and Muftahu, 2023; Timotheou et al., 2023).

The current study focuses on the Unified Theory of Acceptance and Use of Technology (UTAUT), a model developed by Venkatesh et al. (2003, 2012) which combines pre-existing technology acceptance models to provide a joint understanding of the constructs that shape technology adoption. We apply this established theory to the use of online embedded rubrics in HE. Whilst increasing, the use of online embedded rubrics for assessment and feedback purposes is not common practice everywhere. However, as Learning Management Systems (LMS) become ever more sophisticated and incorporate online rubrics as a fundamental tool, the need to understand teachers' perceptions towards this is imperative.

Most literature considering technology adoption in HE focusses on students, not staff at HE institutions (Granic and Marangunic, 2019). Thus, there is no specific discussion on the use of online embedded rubrics and how the UTAUT model can help to understand the willingness and acceptance of these systems. The present paper attempts to address these two significant gaps by considering the adjustment of the UTAUT model in the context of acceptance of online embedded rubrics (through Blackboard – a learning management system) in HE and gain views from staff members. We argue the need to recontextualise the UTAUT framework to online marking in HE and outline adjustments to the model, contributing theoretical development to the literature in this area. This is suggested through the title of this paper and by our research question: Is UTAUT an appropriate model for understanding the adoption of online embedded rubric tools in Higher Education?

The pedagogic debate around the use of rubrics is not novel and research has indicated both positive and negative perceptions from various stakeholders (Reddy and Andrade, 2010; Panadero and Jonsson, 2020). There is established advice on how rubrics should be developed, designed, and implemented to ensure best practice and successful student learning (Dawson, 2017; Dickinson and Adams, 2017; Jones et al, 2017). Plus, research has looked specifically at online embedded rubrics such as the study by Atkinson and Lim (2013) where they designed a rubric through a Learning Management System (LMS) to provide formative feedback and explored students and teachers' perceptions of key benefits. As a result, the aim of the present paper is not contributing towards rubric design itself. Instead, the focus is on the implementation of online embedded rubrics through an LMS, underpinned by the UTAUT model to investigate the suitability of this framework in this context. Considering this novel and unexplored context, and the

methodological criticism to technology acceptance research (Turner et al., 2010; Lu and Yang, 2014; Nistor et al., 2014), the present study adopts a qualitative approach.

The following sections of this paper include a literature review that explores the background of technology acceptance models, UTAUT and its use on LMS research in HE. This is followed by the methods section outlining how 30 semi-structured interviews were conducted. The results section reports the main findings of these interviews. Finally, the discussion section reflects on how these findings align with the extant literature and the main research question under analysis. The paper closes with a concluding remarks section that addresses practitioner implications, limitations and future research suggestions.

Literature

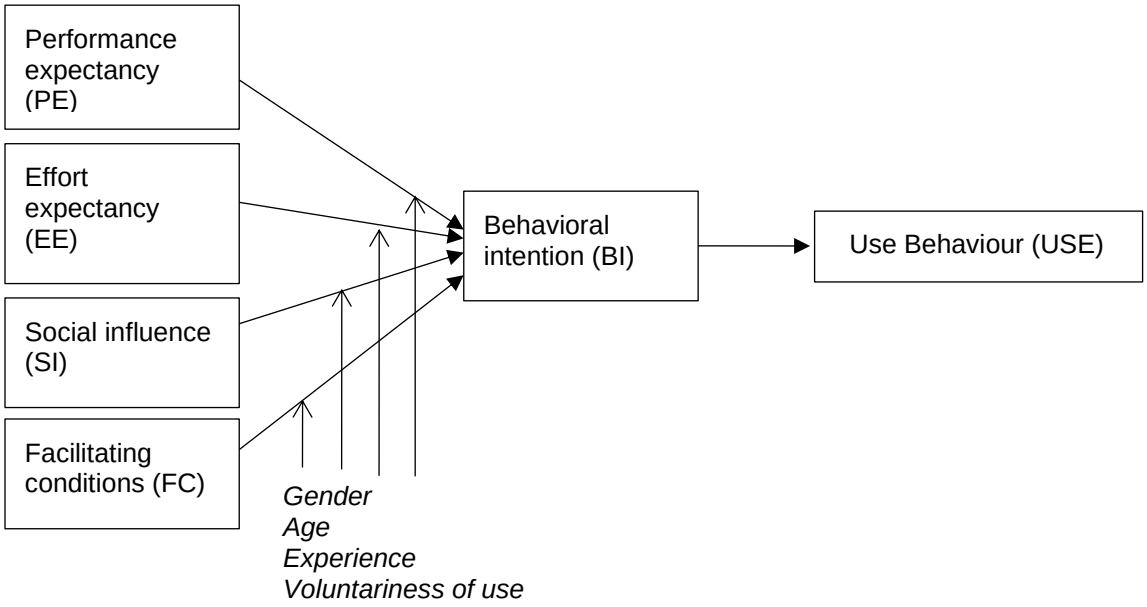
Venkatesh et al. (2003) introduced the Unified Theory of Acceptance and Use of Technology (UTAUT) based on a review of previous acceptance models. Later, Venkatesh et al. (2012) adapted it to incorporate the consumer technologies perspective, naming it UTAUT2, and added further use determinants like hedonic motivation, price value, and habit. Despite UTAUT2 being used to study academic perceptions in HE (e.g. Hu et al., 2020), as the present study intended to focus on the organisational implementation (Rondan-Cataluña et al., 2015), we have adopted the original UTAUT dimensions in this study.

UTAUT proposes four direct determinants of user intentions and actual use which include performance expectancy, effort expectancy, social influence, and facilitating conditions (see Figure 1). Performance expectancy (PE) refers to the belief that the technology will improve the way the job is done. Effort expectancy (EE) refers to how easy users believe it is to use. Social influence (SI) relates to the perception of what significant others (peers, colleagues, supervisors) think staff should be doing. Facilitating conditions (FC) refers to the extent to which people believe there is training and support infrastructure (Garone et al., 2019). In turn, behavioural intention (BI) relates to plans to use the technology, and actual use (AU) represents its final adoption. The model also considers additional moderator variables including respondents' gender, age, experience, and the voluntariness of use.

Research considering UTAUT tends to be quantitative in nature with the application of a pre-established questionnaire adjusted to the context of investigation (e.g., Alowayr, 2022; Alyoussef, 2022; Mujalli et al., 2022). For example, looking at the factors that influence accounting students' and faculty members' use of the Blackboard platform, Mujalli et al. (2022) used a quantitative approach, extending and modifying UTAUT by adding four new variables: perceived risk, mobility, self-efficacy, and self-managed learning. They found support for the traditional UTAUT dimensions as well as the newly added ones. Alowayr (2022) also extended UTAUT by including intrinsic motivation, mobile learning self-efficacy and perceived satisfaction. They empirically tested it with 200 HE students confirming expected relationships between variables and making recommendations for practice in mobile learning adoption. Furthermore, in an empirical study using TAM and UTAUT with 213 undergraduate students, Alyoussef (2022) found that attitudes toward blended learning and intentions to use flipped classrooms have the biggest impacts on its adoption.

Figure 1

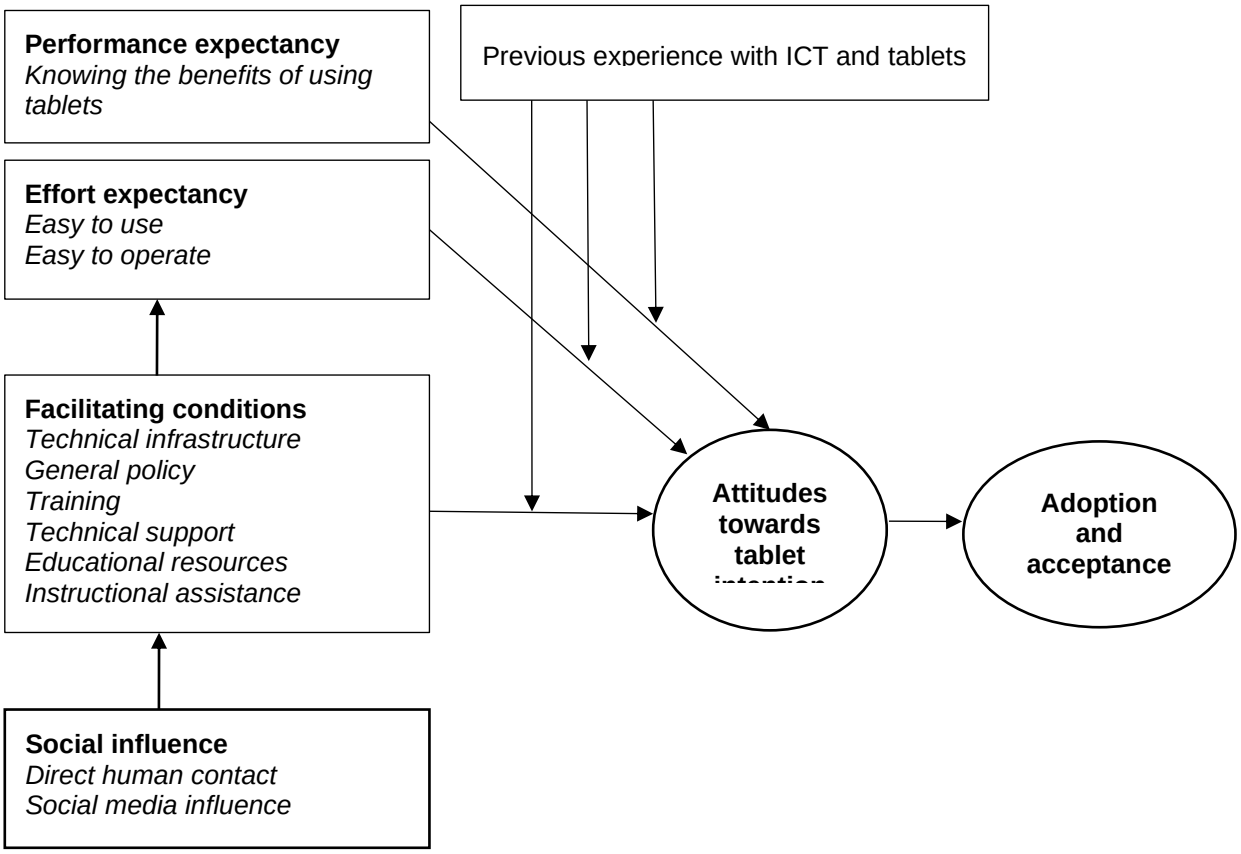
Unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003).



Although UTAUT is a quantitatively developed model, there have also been conceptual, qualitative, and mixed methods studies further exploring the model. For example, O'Dea and O'Dea (2023) used the Technological Pedagogical Content Knowledge (TPACK) framework and the UTAUT as theoretical foundations, arguing that Artificial Intelligence (AI) technologies do not exhibit pedagogical affordances (that is the benefits of using technology for teaching particular content in a particular way) in HE and discussed national, institutional, and personal level challenges. This combination of TPACK with technology acceptance models has also been investigated by Hsu, (2016) and Mei et al., (2017). Similarly, using a descriptive case study approach with fifteen teachers, Khlaif (2018) used teacher's weekly lesson plans and individual interviews (based on UTAUT) to explore the factors influencing adoption and acceptance of tablets in Palestian schools. This study found that teachers' attitudes are a critical factor in accepting tablet use in classroom, and in turn, their attitudes are influenced by the perception of technical support, instructional assistance, and infrastructure. They suggested a new UTAUT framework specific to the use of tablets based on their themes (Figure 2).

Figure 2

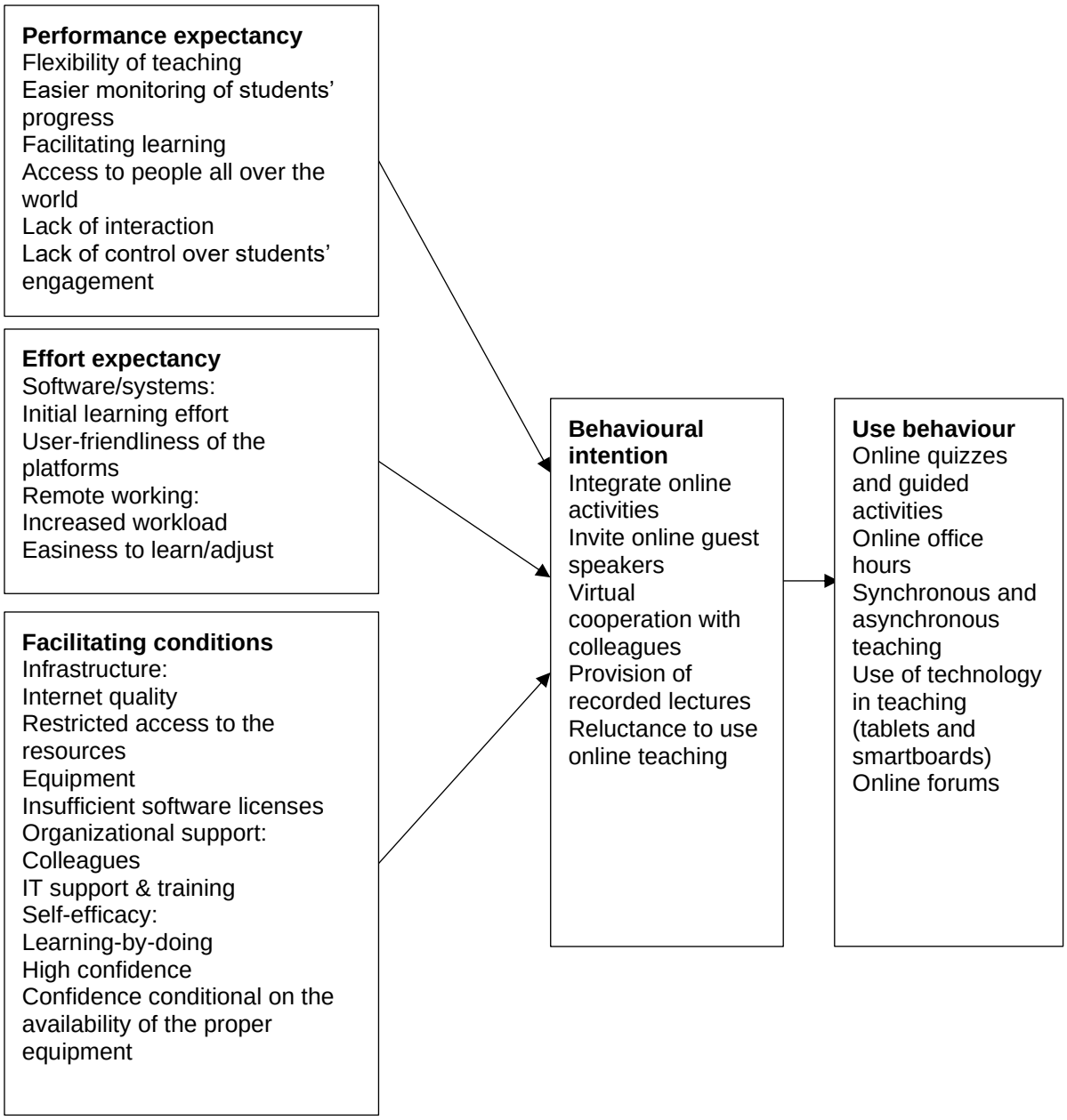
The relationships between the themes and subthemes with attitudes as reported by the participants (Source: Khlaif, 2018).



Also using qualitative research design, Glushenkova and Zagato (2023) explored how emergency remote teaching during the pandemic affected university business teachers' perception of online teaching. Focusing on the three primary constructs of the UTAUT model (performance expectancy, effort expectancy, and facilitating conditions), these authors found through semi-structured interviews that perceptions improved after one semester of technology use and uncovered additional variables that may act as barriers to the adoption of e-learning, such as poor quality of Internet, high workload, and lack of proper online pedagogic training. They concluded that users will only adhere to the new technology if they find it beneficial to their practice. The main themes from their study are summarised in Figure 3.

Figure 3

Main themes and subthemes identified by Glushenkova and Zagato (2023:5) in their qualitative study of UTAUT.



Nistor (2014) critiqued technology acceptance models, highlighting methodological issues through quantitative approaches, inconsistency in significance of results, moderator variables inflating intention-behaviour outcomes, and the fact that many studies do not measure behaviour. Other criticisms included lack of research considering staff and UK HE institutions (Granic and Marangunic, 2019) as well lack of social constructs (Lu and Yang, 2014). Consequently, Nistor et al (2014) investigated the generic technology acceptance and a virtual academic community of practice. The generic technology acceptance factor proved non-significant, but the community factor explained a high percentage of variance in technology use. In addition to these critiques,

Turner et al. (2010) cautioned researchers against applying acceptance models beyond their original and validated contexts, urging a reconsideration of technology acceptance models in specific settings.

UTAUT and Online Embedded Rubrics in Higher Education

Learning Management Systems (LMS) like Blackboard and Moodle are extensively studied using technology acceptance models (e.g., Chugh et al., 2023; Matarirano et al., 2021; Aldosemani, 2023; Alshehri, 2023). Granić's (2022) systematic review categorises LMS acceptance through the UTAUT lens into individual, contextual, and psychological / behavioural constructs. Sulaiman (2024) focuses on crucial factors influencing LMS use in Arab Gulf Countries, confirming the trend of using TAM and quantitative designs, identifying fundamental factors in LMS implementation such as perceived ease of use, perceived usefulness, social influence, performance expectancy, effort expectancy, facilitating conditions, self-efficacy, and attitude. Moreover, the perception of LMS use has also been explored from a student (e.g., Devisakti and Muftahu, 2023) and a teacher perspective (e.g., Kaewsaiha and Chanchalor, 2021; Aziz et al., 2022) as well as considering both students and teachers in the same study (e.g., Zwain, 2019). These studies make it clear that priorities for both students and teachers differ when considering LMS use.

Considering academics' perceptions, Muries and Masele (2017) found positive influences from perceived importance, perceived ease of use, and organizational management support. Interestingly, facilitating conditions had no significant impact on LMS continued use, suggesting the critical role of performance and effort expectancy, along with social influence, in LMS adoption and continued use. In a study of lecturer's adoption of Blackboard using GETAMEL, Matarirano et al., (2021) found that an LMS will be adopted and used if considered useful, otherwise resistance will occur. They also emphasised the importance of training and technical support. Moreover, Nikou and Aavakare (2021) revealed that information literacy directly and significantly influences the intention to use digital technologies. In contrast, digital literacy does not have a direct impact; instead, its effect is mediated by performance and effort expectancy. This suggests that there is an expected base line in HE nowadays with regards to digital literacy amongst staff and therefore it is only the performance of respective tools, or the effort required into using digital technologies that will mediate the intention to use them.

Demir et al. (2022) compared Blackboard, Moodle, and Canvas and argued that users experience matters in HE, particularly their subjective satisfaction with the LMS considered, its ease of use, and its functionality. This is also reflected in Modise and Molotsi's (2022) study that investigated the perceptions of new lecturers in LMS adoption and found that they were unfamiliar with such systems and therefore struggled with lack of proper skills, the design of some LMS functions and their own attitudes towards digital literacy. The authors recommended training and support that matches specific individual digital literacy needs. Once again training and support are highlighted as main contributors to successful acceptance and adoption of LMS implementations.

To conclude, previous quantitative studies have supported the effects of UTAUT constructs on technology adoption in different contexts (e.g., Alowayr, 2022; Alyoussef, 2022; Mujalli et al., 2022). Moreover, despite additional variables being considered by different authors, the most cited significant impacts in the literature still refer to performance expectancy, ease of use, and effort expectancy, with social influence and facilitating conditions exhibiting mixed results (Gruzd

et al., 2012; Jung and Lee, 2015; Oye et al., 2014; Pynoo et al., 2011). Subsequently, research applying UTAUT to LMS contexts is mostly quantitative and confirms these effects particularly when considering the perspectives of academics (Muries and Masele, 2017; Matarirano et al., 2021; Nikou and Aavakare, 2021; Demir et al., 2022; Modise and Molotsi, 2022), whilst also highlighting that perspectives and priorities on LMS use differ between students and teachers (Zwain, 2019; Kaewsaiha and Chanchalor, 2021; Aziz et al., 2022; Devisakti and Muftahu, 2023).

However, it was through the qualitative studies (e.g., Khlaif, 2018; Glushenkova and Zagato, 2023) that UTAUT research has been able to tap into implementation challenges, giving specific voice to contextual variables that go beyond the existing quantitative items considered by UTAUT. Hence, research has also highlighted the important role of teachers' acceptance and the additional facilitating conditions required in LMS contexts (e.g., Chugh et al., 2023; Matarirano et al., 2021; Aldosemani, 2023; Alshehri, 2023). Hence, and given the gap in terms of online embedded rubrics considering UTAUT, the present study adopts the original UTAUT model in a qualitative manner to further explore its meaning in the context of HE online embedded rubrics.

Methodology

The research utilised an exploratory case study approach to provide a comprehensive understanding of a typical teaching focussed university as well as obtain real world applicability (Yin, 2018). Specifically, we were interested in the adoption of online embedded rubric tools as a marking and feedback approach within a typical teaching focussed university, therefore as part of the sampling process it was imperative to choose a representative institution. The chosen university achieved upper to mid table rankings in the Guardian's UK universities 2023 report (Guardian, 2023). It has approximately 38,000 staff, almost 4000 students, and offers a variety of programmes across the arts, business, law, engineering, health, and science disciplines (Complete University Guide, 2024). All the above made it a typical and representative teaching focussed university in terms of ranking, size, number of staff and students, as well as subjects offered.

We chose the case study institution as there was mixed awareness, use, guidance and indeed no formal policy around using online embedded rubrics and LMS. Furthermore, UTAUT has historically been empirically tested via quantitative methods, therefore taking a qualitative approach addressed this methodological gap and provided greater contribution in relation to the specific context the theory was being applied to. This approach has also been undertaken by other researchers using the UTAUT model for example Glushenkova and Zagato (2023) who explored the effect of COVID on digitalization in HE, and Khlaif (2018) who explored teacher's perceptions of mobile technology use in classrooms.

The current paper aims to explore the dimensions of the UTAUT model in depth as well as provide richer insights into staff's experiences with online embedded rubrics for assessment and feedback purposes. Thirty semi-structured interviews were conducted in total. Purposive sampling was used to identify participants as it was important to ensure we included staff from across the different faculties and with varying teaching tenure. That said, there were some limitations with the sampling for example, most participants (N=20) were aged 40-59 with only 1 person aged between 20-29. Although that does represent a typical academic population in that most academics do not start in post until 30+. Whilst the faculties were reasonably well represented,

the sample only included 4 participants from the Arts department. Most staff (N=8) had a tenure of between 6-10 years, with 21+ years coming second (N=7) with newer staff (less than a year) being less well represented (N=2). After potential participants were identified, they were contacted via email, given a detailed participant information document, as well as a consent form to sign if they were interested in taking part. The table below provides an overview of the participants across the different age groups, university department, and tenure of academic job role.

Table 1

Table Showing Participant Information.

Participant No	Age	Department	Tenure
1	50-59	Business	1-5 years
2	20-29	Business	Less than a year
3	30-39	Business	1-5 years
4	50-59	Business	11-15 years
5	50-59	Business	21+ years
6	30-39	Business	Less than a year
7	40-49	Business	16-20 years
8	50-59	Business	21+ years
9	40-49	Technology and Engineering	6- 10 years
10	30-39	Technology and Engineering	6- 10 years
11	40-49	Technology and Engineering	1-5 years
12	30-39	Technology and Engineering	6- 10 years
13	40-49	Technology and Engineering	6- 10 years
14	50-59	Technology and Engineering	21+ years
15	50-59	Technology and Engineering	16-20 years
16	40-49	Health and Science	Undisclosed
17	30-39	Health and Science	6- 10 years
18	40-49	Health and Science	16-20 years
19	60-69	Health and Science	21+ years
20	40-49	Arts	16-20 years
21	50-59	Arts	16-20 years
22	50-59	Arts	21+ years
23	50-59	Health and Science	1-5 years
24	60-69	Technology and Engineering	21+ years
25	50-59	Health and Science	6- 10 years
26	30-39	Health and Science	6- 10 years
27	40-49	Health and Science	21+ years
28	40-49	Arts	6- 10 years
29	30-39	Health and Science	Undisclosed
30	40-49	Health and Science	Undisclosed

Ethical clearance was provided for data collection through the University and Faculty Ethics Committees. Semi-structured interviews were conducted by a sole research assistant, online via Microsoft Teams, and each interview was recorded. Data from this study were treated as

confidential and kept secure in compliance with relevant UK data protection legislation and GDPR requirements (Data Protection Act, 2018).

Initially, a single pilot interview (DS000) was conducted and recorded (6th of April 2022). This interview took approximately 45 minutes utilising the draft interview schedule. Feedback from the participant was subsequently received regarding the interview questions. No issues were identified with the questions themselves, and indeed the flow of questions appeared to be logical. The only amendments made to the interview schedule was the timing of the first question, this was reduced from 10 to 5 minutes, and some additional prompt statements were added to aid future interviews. The interview guide was used to facilitate the interviews, but also allowed flexibility to follow up on interesting or unexpected responses.

In total 30 semi structured interviews were conducted between the 6th of April 2022 and the 27th of June 2022. The average length of each interview was 52 minutes. During the interviews, participants provided some demographic data, such as age, gender, job role, faculty, subject taught, years of employment in HE, and the number of institutions they have worked in HE. Microsoft Teams produces an automated transcript of each recorded interview, therefore each transcript was later checked and verified by the researcher to ensure it captured the content verbatim, each document from each participant was then anonymised.

The interviews were transcribed from Microsoft Teams into Microsoft Word and coded manually using a color-coding system and entering this into the NVivo software. The three authors were involved in the coding process therefore it was imperative to ensure consistency occurred across the different participants and the interpretation of the UTAUT model dimensions. As the interview schedule was developed around the UTAUT constructs, a deductive latent approach was used in the coding to identify content related to each of the model's dimensions (Braun and Clarke, 2006). A codebook was created which defined each of the UTAUT dimensions to ensure unified interpretation. However, as each researcher only coded a selection of dimensions, it was necessary to cross check these across the team and therefore regular meetings were held during and at the end of the coding process to ensure consensus, consistency and that no data had been neglected. The final step in the process was to write a summary of each of the constructs and this task was divided across the three analysts. Once completed, these were again cross checked by the research team to ensure that the interpretation and quotes included were accurate and comparable across the entire data set. The summaries of each dimension of the model were then utilised to formulate key findings which have been outlined in the next section.

Results

Performance Expectancy

Our review of the data coded under the UTAUT model's category of performance expectancy yielded a distinct split. Where participants spoke of marking the paper, uploading feedback, and other associated administration, this was included in what we've called Transactional Performance Expectancy. Where the participants spoke of maximising the student's opportunity for learning from the assignment experience, this was included in what we've referred to as Student Learning Performance Expectancy.

Transactional Performance Expectancy

The online embedded rubrics tool on Blackboard was seen by some as quick [001, 003, 028] especially once trusted [014]. The tool aided consistency between markers [001, 028, 025] and within marking without impinging on academic judgement [001], perhaps because it cannot be used mechanistically [007]. The tool also supported discussions about marking [001], perhaps because all the markers are using a common tool [021]. While the time taken to read scripts was unchanged [009] or longer [018, 026], the associated administration was lower [010, 018] albeit with more set-up time [008] and providing the IT isn't down [007].

Some staff didn't see the embedded rubrics tool on Blackboard as quicker [004] perhaps because individual feedback is still required [001]. The tool was unhelpful in completing the marking task in the following ways: not enabling a view of the whole cohort in the round [007]; being time consuming and non-intuitive to set up [008]; for only displaying weighted scores [008]; for not displaying which papers have been marked if staff are marking only parts of students' answers [008]; for undermining blind marking as student names and the marks given by other markers are displayed [015]; for promoting student hang-ups on the marks given in each box [021] and affecting the grades.

> *It's rounding everything up... I'm not prepared to use something that makes marking slower or inflates the grades and what I'm doing works, so why would I change it?* [017]

Some staff who hadn't yet switched were not convinced by the demonstration calling the tool "clunky" [019, 022] and finding that the tool would not be useful for staff who prefer to comment directly on student submissions [020]. One participant thought that the tool involved unhealthy amounts of screen time [009], while for some staff the breakdown of the assessment task into multiple boxes, each with a score was unwelcome and time-consuming [007, 020, 026].

> *This presupposes that I can break the task down into you know five or six marking criteria, and each of those I can work out in advance what I should put in another 5 boxes, so I should be able to write something meaningful and reasonable in 25 different boxes*. [007]

Other concerns around the tool were that rubrics allow students to calculate and challenge their marks [012] and to complain about the marks for each section [024]. Students may compare and find they have been awarded different boxes in the rubric for writing similar things and "*catch you out"* [014].

Student Learning Performance Expectancy

Moving beyond the task of completing marking, staff told us about whether the tool promotes student learning, the aim of marking and feedback. Blackboard rubrics show students visually where they have done well and not so well [008] and quickly shows them how to improve [002]. Breaking the marking down into sections gives students the opportunity to score highly in some areas, even if they do badly in others [015]. Whereas an annotated script may overwhelm students [015], the grids force staff to highlight positive as well as negative areas [015] and give all students equal treatment, driving a logical approach to marking [025] and ensuring "*consistency, clarity and precision"* [025]. Rubrics may make an even bigger contribution if they not only drive consistency of marks between students but also consistency between modules, especially on the

same programme [008], otherwise individual modules are "*islands*" [012]. Staff, though, are not looking for total standardization between different modules [008]. Rubrics' contribution to student learning is maximised when shared in advance of the assessment [001], for example in the module handbook [004] and when staff and students spend time looking at the rubrics together, ensuring that students understand it [012, 014, 027].

Participants had ideas about how the tool could be developed to enhance student learning. Several participants [012, 028 and 029] commented on the theme of extending Blackboard to keep student feedback consistent in form and stored in the same place allowing students to find their feedback, reflect on it over time, look for key themes (perhaps with system assistance). One participant felt that system changes could re-establish student anonymity during the marking process [015]. Crucially, we could use the system to interact with students and "*learn if they've learned*" [013].

Effort Expectancy

Participants referred to two core aspects of online embedded rubrics. One was around the initial set up stage of the grid and one was around the usage of the rubrics themselves in the marking process. The conversations around the effort required at these two stages were quite different.

Set Up of the Rubrics

The effort expectancy for creating and setting up online rubrics was deemed high amongst the participants. The setup was not seen as particularly intuitive or flexible, it involved a steep learning curve [008, 012], and could be difficult and time consuming [012]. For one participant, these issues meant there would need to be a dedicated person or team to implement them from the offset [020]. The language used in the rubrics is important and that sometimes the criteria need to be specific to the assignment [008, 020, 022] but if the assignment (and therefore the rubric) changed year to year this could create more work, mitigating any efficiency and reduction of effort that rubrics provided at the usage stage [023].

Many participants alluded to a cost benefit approach in considering new practices. The effort put into training and learning a new assessment and feedback technique needed to be worthwhile, enhancing or increasing the efficiency. New tools needed to be relatively quick to learn [013]. Some participants told us they don't have the time or energy to explore different marking systems [029] and there needs to be consistency rather than constant change. People become comfortable with what they do and are reluctant to make changes to working practices [011]. As a solution to this issue some participants said that being trained and taught to use the systems would reduce the expected effort [013] however there needs to be time and opportunities to attend the training [014]. One participant mentioned that in the same way that students have different requirements, staff do too and that needs to be considered when implementing new systems [005].

> *There might be a little bit of increase in efficiency, but you must put a lot of effort to change the rest of the system.* [029]

Using Rubrics to Mark

Some participants felt that the online embedded rubrics approach was much more efficient, quicker, straight forward, with fewer steps involved, in comparison to the other marking methods where there is a time-consuming downloading and uploading of multiple feedback documents [000, 002, 005].

> *I compare it to my approach with other modules, I'm managing a separate spreadsheet which I then must upload marks into Blackboard, whereas the rubric does all of that for me. [000]*

In contrast, other participants felt that the rubrics would involve more effort. Taking time to explore and understand the technological tools on Blackboard takes away time from providing feedback to students [007]. Sometimes new technologies do not always provide the ease and improvement that people assume, and increasing effort and efficiency needs to in this case benefit both staff and students [006].

> *No, I suspect this will make me to spend more time messing around with Blackboard and less time giving meaningful feedback to students*. [007]

Social Influence

One participant highlighted that to positively influence change, advocates are needed: people willing to try something and then encourage others to utilise it based on their experiences [015]. Some people naturally seek to explore, experiment, and review their working practices, spending time exploring new ideas. Whereas other people may not have the drive to do so for many reasons [10]. If changes are imminent or if new technologies are being considered, explaining this to people who are already open is one thing but trying to convince others who aren't naturally invested is where the challenge lies [012].

> *Unless the right audience is listening, it's like talking into a vacuum in some ways because preaching to the converted.* [012]

> *I think you need those key people infiltrating the department who are wanting to kind of pilot something and give it a go. Then they're more likely to spread that kind of positivity, and other people will adopt it as well.* [015]

Some participants [008, 012, 015] mentioned having conversations with staff members about different marking approaches. For staff to promote a particular technology, it must work well and be worth sharing with other people. Alternatively, if a particular approach or tool doesn't work very well then, that information also gets passed around very quickly through word of mouth.

> *I think a lot of it is word of mouth of people like me saying "we tried rubrics on this, and it was really useful and helpful, and it worked."* [008]

Communicating how decisions are made, who is making the decisions, and the timing of the decision-making [014, 019, 020, 025] is key. Participants advised making changes after the exam boards once the academic year is complete and ensuring that decisions are made across different levels of seniority and departments. Big changes should be carried out slowly to ensure people don't feel uncomfortable about being forced to use certain technologies.

> *There are ways of improving things, but I think again communication is vital, so communicating with staff in a timely and empathic manner would be incredibly helpful.* [025]

There were clearly some concerns about resistance to change. Despite many people being supportive of innovations there will always be staff who do not agree and even fear change. Often these people can have strong, powerful voices, along with authority, and therefore change and innovation can get blocked [024, 025, 026].

> *At the department level innovation like this is fantastic and there are people in my department who would love something like this, but it's not being brought in because of the loud voices of resistance from the people that have been there a long time*. [025]

Facilitating Conditions

New online tools can only be introduced into a context that supports their use. This context comprises university policies, working practices, reward and recognition approaches, as well as specific training for the new IT.

Training

Staff highlighted the availability and timing of training. Some participants [013, 018, 019, 022, 023, 027, 028, 029] said they had not been offered training in the new online marking and feedback tools and this might be why staff aren't using innovative approaches [024]. While another [009] noted emails detailing training had circulated, but they hadn't attended because the training coincided with busy times, a view supported by others [021, 000, 006].

> *When the marking comes in, we need to move quickly to keep on top of it. You know you might have several modules all coming in at the same time, so there's not time then to be fiddling around with like, 'how can I learn this new system?'* [021]

Where staff (in the minority) had attended training, they had concerns about the long sessions for a short useful section [026] and coverage of the trickier aspects.

> *They spend absolutely ages telling us about the things that are really easy, and then they get to the things which are really challenging - and you cover those in about 5 minutes.* [023]

Some staff supported training by step-by-step video or podcast [000, 004, 014, 024] while others specifically wanted classroom interaction as part of their learning [009, 010, 013, 023] or written instructions with a more intuitive system [018]. Several participants noted that training needs to come with post-training support to reinforce the use of new systems [000, 006, 008, 021].

Support

Several participants [000, 006] highlighted what necessitates support beyond the initial training, with one saying:

> *It is a constant worry … whether I'm ticking the right box to put it in the right place at the right time for them [students] to be able to see and equally whether I inadvertently tick a box and make it visible too early before we finish moderation*. [000].

Specialist units within some departments provided video training and presentations around utilising different technologies / tools and staff can engage with these [008, 012, 014]. The response from these was very positive and people seem to like being shown the different approaches available to them.

> *The X Department, they do some fantastic presentations. They come and talk to us. They show the latest bits of software.* [012]

Our participants' views on the support available ranged from *"There's none"* [011] to *"the Blackboard Support team at [the university] are brilliant"* [013]. Behind this diversity of views lay a broad consensus that on the whole support was *"self-service"* [006]. The formal support (the IT helpdesk, help pages on the intranet, links in Blackboard, training sessions and departmental learning technology staff) relied on the individual realising there was a problem or an opportunity, seeking a solution, and broadly knowing who to approach for assistance.

> *I think one of the difficulties with a big institution like this is finding out where the support is. I'm sure sessions are available, but I've not heard of any, but that doesn't mean they don't exist.* [020]

As a response, staff reported various routes to informal support such as through module leaders [000], peers [005, 003, 022], the Student Administration Team [000, 028], the library [002] and even family.

> *I was lucky enough that my partner could lend me some screens, otherwise I would have had to do all of it on my laptop.* [005]

There is a sense, though, that the self-service offering means missed opportunities with one staff member [008] describing a colleague using a tool they knew, not realising it was highly inefficient.

> *How do you make someone aware of other options who feels they don't have time to go and learn about other options?* [008]

Furthermore, if the support is only based around using the tool, then it may not lead to desirable teaching and learning outcomes. Staff pointed out that training and support on the online systems needed to be extended into staff development on pedagogy so that appropriate use can be made of the online tools [001, 005, 008, 026]. Finally, the university's approach to promotion does not appear to reward staff for putting aside time to engage with online teaching and learning tools.

> *If you're going to reward people for bringing in research income and for writing impact case studies, which is the main route to promotion… unless there's another route to promotion that recognises innovation in teaching or developing new methods or improving teaching practice … You aren't going to get people to engage.* [026]

Time and Workload

One participant described their marking and feedback workload as "*horrendous*" [000], echoing a large number who described a university workload model that undervalued and underestimated the time needed for marking [006, 007, 012, 017, 019, 022, 029].

> *Most staff are so overworked that they're not even taking holidays* [016]

For some, online systems have facilitated the transition of workload from administrators to teaching staff rather than reducing the load [003, 007, 013]. The impact of the workload was that staff were left with no time for anything non-essential, like training and innovation [006, 008, 009, 014, 015, 016, 024, 025, 026].

Systems at the University

Few of our participants understood the differences between various university systems and used terms like 'Blackboard' to describe a process flow that incorporates multiple different university systems, many of which are not seamlessly connected to each other [015]. At least some of the confusion may be down to the sheer number of different submission, marking and feedback approaches in operation around the university (from proprietary bolt-ons, Blackboard tools, the use of shared drives, spreadsheets, and bespoke systems).

> *OneDrive is much easier because then everyone can just do their questions simultaneously and then put all their marks in an Excel file, it goes down brilliantly. So, it's brilliant for the actual marking, but it's terrible for the submission. Blackboard is brilliant for the submission, but I would say quite bad for the submission when there are multiple markers working on the same script.* [016].

Many of these approaches appear to be work-arounds to make systems work in the circumstances, but there is no sense of an ideal where staff choose the appropriate approach for the needs of their programme.

> *We almost always set it for single marking. And then if we're going to do second marking, we do that sort of manually. It is a very powerful tool, but it's just not efficient to use in that sense, so we tend not to.* [008]

For some participants, the IT systems actively made the marking slower because the IT keeps crashing or Blackboard can't cope with more than 100 student submissions or because users must keep exiting and re-entering [024, 025] or because the systems are '*clunky*' [026] or '*hard to navigate*' [028]. Those participants who felt they successfully navigated the university systems self-identified as *'nerds'* [008] or *'curious'* [010] and set out to optimise their approach from the systems available.

While some participants identified other universities and other systems as superior (for example, the Open University [024]), most described them as *'differently clunky'* [008] because they all face the same challenge.

> *My guess is they all suffer the same fundamental problem that they're generic systems that you need to translate into the practice of this specific institutional pick.* [007].

Discussion

For technology acceptance models applied to LMS in UK HE institutions in the 2020s, and in contrast to some earlier studies (Rogers, 2000; Hu et al., 2003), we found that staff ability to use generic technology is no longer relevant as this ability is an essential element of teaching job roles (Nikou and Aavakare, 2021). Every teacher in our sample engaged with the university LMS to an extent, necessitated by institution policies and the drive to deliver the cost-effective, volume

teaching play associated with a typical teaching focussed institution. This finding supports Nistor et al.'s (2014) assertion that technology acceptance is not significant. Although Khlaif (2018) used previous experience with ICT as a critical moderating factor, this difference may be explained by location (UK versus Palestine) and the institutional embeddedness of the technology (use of an institutional LMS versus using tablets in individual classes). At the time of this study, university policy did not dictate the technology used for marking and feedback, only that marks and feedback were delivered at volume and on schedule into the relevant student-facing system. Technology acceptance models therefore need to be applied carefully in HE with respect to context: the type of technology, the use it is put to, and the location of the institution (as advocated by Turner et al., 2010).

Previous studies (e.g., Gruzd et al., 2012; Jung and Lee, 2015; Oye et al., 2014; Pynoo et al., 2011; Muries and Masele, 2017; Glushenkova and Zagato, 2023) have pointed to the importance of performance expectancy and effort expectancy in predicting use, further suggesting that LMS adoption will face resistance unless considered useful (Matarirano et al., 2021). For marking and feedback via LMS, our findings showed that performance expectancy should be divided into two elements that may pull in opposite directions. The first element, which we have called *transactional performance expectancy*, includes all the variables targeted at satisfying the institution's expectations for teaching job roles such as giving every student a mark, some feedback, and turning marking around within the agreed timelines. Given that most technology acceptance models were developed from the perspective of organisations (Rondan-Cataluña et al., 2015), in most studies' performance expectancy stops here. However, we assert an additional element, *student learning performance expectancy*, is relevant wherever the technology is part of delivery. According to our participants, creating understandable rubrics, discussing measurement criteria with students, offering individual feedback, and aiding positive responses to feedback were crucial aspects of effective marking and feedback. So, in the context of an LMS, student learning must be added to the institution's notions of performance expectancy (Devisakti and Muftahu, 2023), while effort expectancy remains in line with findings from other contexts.

Social influence and facilitating conditions exhibit mixed results in previous studies (Gruzd et al., 2012; Jung and Lee, 2015; Oye et al., 2014; Pynoo et al., 2011; Muries and Masele, 2017; Glushenkova and Zagato, 2023). The richness and depth of qualitative studies such as this one may explain these differences. In our findings, social influence and facilitating conditions were sometimes hard to separate and prompted long discussions amongst the authors during coding and writing, suggesting that survey writers and respondents may have viewed these differently. For example, our participants told stories about local learning technologists embedded within their departments (facilitating conditions) who were particularly effective at demonstrating how technology could be used for the specific content and pedagogical approach. These learning technologists set up formal training (facilitating conditions) but also became advocates for use of the technology (social influence) and created additional advocates (social influence) who prompted conversation about new ways of getting work done (social conditions). This aligns with previous LMS studies that emphasised the role of social influence such as Aziz et al. (2022) and Muries and Masele (2017), as well as those that supported the role of facilitating conditions such as Demir et al. (2022) and Modise and Molotsi's (2022). Our contention is that facilitating conditions and social influence merge into each other and that effective facilitating conditions

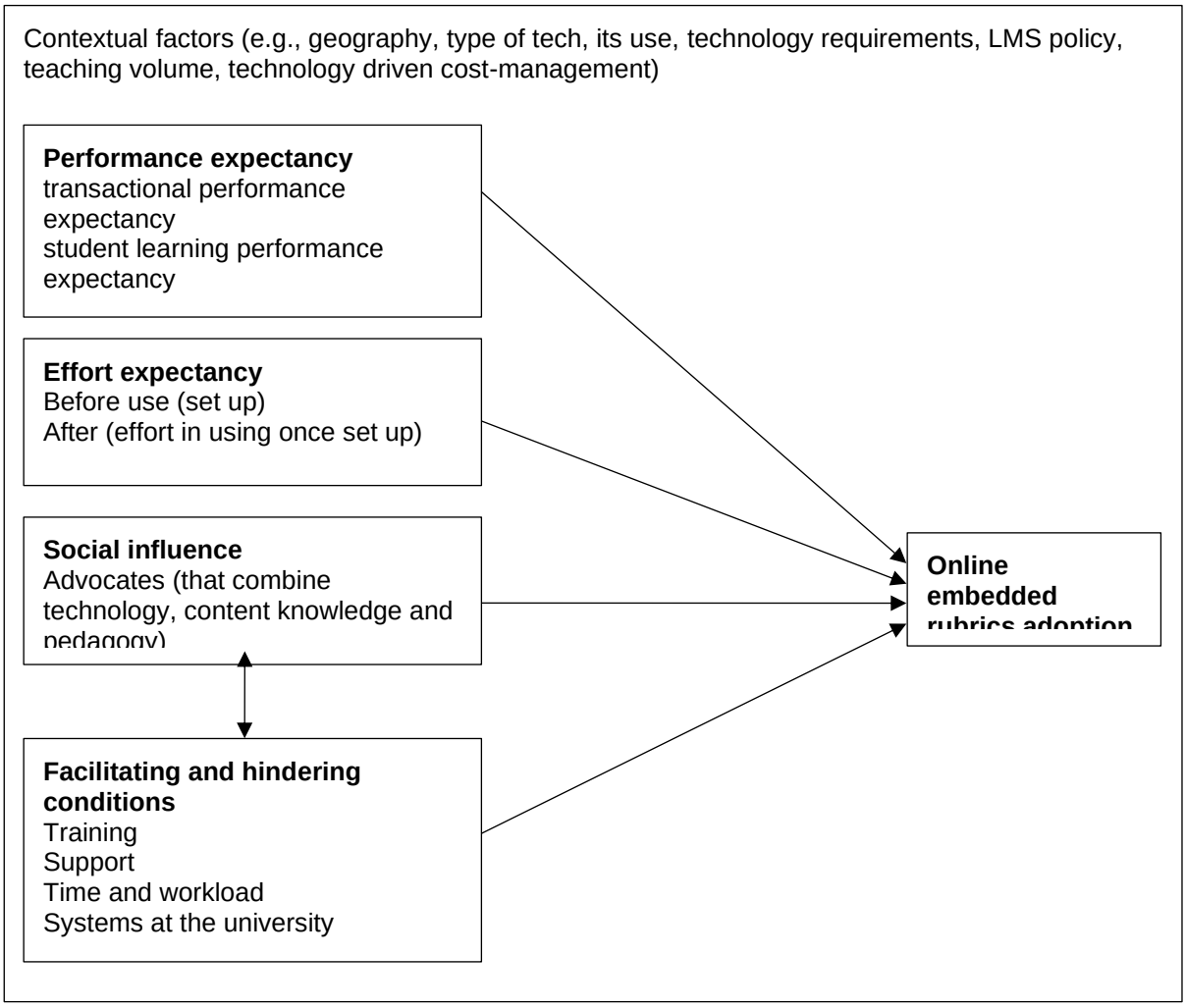
promote and prompt advocacy from teaching staff who combine the domains of technology, content knowledge, and pedagogy (combining TPACK and technology acceptance models as suggested by Hsu, 2016; Mei et al., 2017; O'Dea and O'Dea, 2023) in a way that is more effective than institution-wide training in how the technology works. In practice, to generate broader technology adoption impact, universities/departments should consider creating formal technology advocacy roles, recognizing and rewarding them.

The category of facilitating conditions contains the assumption that the institution prioritises the acceptance of technology and sets out to promote it. In our findings, staff often seem to make the technology work despite the institution. Counting against technology acceptance, innovation and finding effective ways of doing work were the following: workload and the systems to apportion workload; pay and promotion approaches that do not reward innovation or systems adoption; a series of 'clunky', often overlapping, systems; training that is based on the technology and not its application to content or pedagogy; a low-cost, self-service approach to training where staff have to know that the technology opportunity exists in order to select guidelines, materials or workshops; the use of LMS introductions to move workload from administration to teaching staff. No wonder participants spoke of sticking to legacy approaches that they had made work because they could not afford the time or the energy to investigate new ways (aligning with Glushenkova and Zagato, 2023). In HE in the UK this category of the UTAUT model might better be called 'facilitating and hindering conditions' to acknowledge that institutions and their staff face multiple competing priorities in delivering teaching and learning.

Finally, while the UTAUT model presented a broadly useful framework for thinking about use of an online marking and feedback tool at a UK HE institution, the commonly used moderators of age, experience, and voluntariness had no resonance in our study. Neither age nor experience correlated with our findings and using embedded LMS systems to get work done at a university is essential in the 2020s. Instead, we found that the context of the type of technology, its use, and the location of the study seems to explain differences in the findings from previous work and led us to adapt the framework for considering a UK-based, institutionally embedded LMS, used in delivery with concomitant adaptations required in performance expectancy, social influence, and facilitating and hindering conditions, as shown in the diagram below (see Figure 4).

Figure 4

Summary of Main Themes and Additional Considerations for UTAUT Model for LMS in UK HE.



Our main findings suggested that UTAUT is still useful to explore technology adoption in educational settings, which aligns with most studies in the field. However, our qualitative use of the model suggested adaptations, mainly: increased cognizance of the specific HE context, reduced focus on the ability to use technology, the idea that performance expectancy should be considered from an institution and from a student standpoint, the linked nature of social influence and facilitating conditions and the lack of predictive power of previously used moderators.

Implications for Practice

In terms of the implications for practice, we outline several suggestions for managers and HE institutions. Firstly, managers of HE staff must realise that if they want dynamic and innovative practice, staff need time, pay, and support. We suggest that acceptance of technology isn't down to the lack of willingness from staff, but often that the systems themselves are clunky and limiting. So, staff must choose from options that don't suit the task. Institutions therefore need to select tools that are robust enough for the innovative tasks in hand as well as ensure that the tools utilised are pedagogically informed. There is also evidence that changes in workload from administration staff to teachers is hindering innovation due to a lack of time for HE staff. Therefore, for implementation of new tools to be successful staff need to be given time towards exploring options for marking and feedback. Staff also need to be able to evaluate the relevancy of the technology to see if it adds value to their work. Ultimately, both facilitating conditions and social interaction opportunities need much stronger consideration.

Limitations and Future Research

The research focussed on a single typical teaching focussed university UK case study which allowed rich data to be collected but may limit the generalisability to other institutions which depend on student numbers as a major income stream, already require technology use from staff, and see further technology adoption in LMS as a contributor to both cost-management and the personalisation of the student journey.

Future research should therefore aim to replicate these findings across other settings and contexts such as those universities where student fees are a lower proportion of revenue, where cost management is not the same driver for LMS technology adoption, and in other geographies where technology is widely available and in use in Higher Education. Finally, due to the small sample size, the moderators in the model were not significant and did not impact the results, however it is possible that these results may differ given a larger sample. Further research needs to explore the impact of these moderators.

Acknowledgements

We are grateful for the funding provided by Higher Education Innovation Fund (HEIF) at the University of the West of England which enabled the completion of this project. We are also grateful to Dr Giang Nguyen for her role as a research assistant in collecting the data for this project.

'The authors disclose that they have no actual or perceived conflicts of interest. The authors disclose that they have not received any funding for this manuscript beyond resourcing for academic time provided by the Higher Education Innovation Fund (HEIF) at the University of the West of England and for which the authors are grateful. The authors have not used artificial intelligence in the ideation, design, or write-up of this research as per Crawford et al. (2023).

The authors list the following CRediT contributions:

Anabela Soares: conceptualization, software, analysis, writing, supervision, project administration, funding acquisition

Moya Lerigo-Sampson: methodology, software, analysis, writing, funding acquisition

Jacqueline Barker: methodology, software, analysis, writing, funding acquisition

Giang Nguyen: investigation

References

Aldosemani, T. I. (2023). A Technology-Acceptance-Model-Based Study of the Attitudes Towards Learning Management Systems Among Teachers During the COVID-19 Pandemic. *International Journal of Online Pedagogy and Course Design (IJOPCD), 13*(1), 1-22. http://doi.org/10.4018/IJOPCD.325240

Alharbi, A. H. (2023). Investigating the acceptance and use of massive open online courses (MOOCs) for health informatics education. *BMC Med Educ. 23*, 656, 1-10. https://doi.org/10.1186/s12909-023-04648-9

Al-Nuaimi, M. N., & Al-Emran, M. (2021). Learning management systems and technology acceptance models: A systematic review. *Education and Information Technologies. 26*, 5499–5533. https://doi.org/10.1007/s10639-021-10513-3

Alowayr, A. (2022). Determinants of mobile learning adoption: extending the unified theory of acceptance and use of technology (UTAUT). *International Journal of Information and Learning Technology, 39*(1), 1-12. https://doi.org/10.1108/IJILT-05-2021-0070

Alshehri, E. (2023). English as a Foreign Language Teachers' Acceptance of Using Blackboard Collaborate Ultra in Higher Education. *World Journal of English Language, 14*(2), 90. http://dx.doi.org/10.5430/wjel.v14n2p90

Alyoussef, I. (2022). Acceptance of a flipped classroom to improve university students' learning: An empirical study on the TAM model and the unified theory of acceptance and use of technology (UTAUT). *Heliyon, 8*(12), e12529. https://doi.org/10.1016/j.heliyon.2022.e12529

Atkinson, D., & Lim, S. L. (2013). Improving assessment processes in Higher Education: Student and teacher perceptions of the effectiveness of a rubric embedded in a LMS. *Australasian Journal of Educational Technology*, *29*(5), 651-666. https://doi.org/10.14742/ajet.526

Aziz, F., Mohd Rasdi, R., Md Rami, A., Razali, F., & Ahrari, S. (2022). Factors Determining Academics' Behavioral Intention and Usage Behavior towards Online Teaching Technologies during Covid-19: An Extension of the UTAUT. *International Journal of Emerging Technologies in Learning (iJET)*, *17*(09), 137–153. https://doi.org/10.3991/ijet.v17i09.30481

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Chugh, R., Turnbull, D., Cowling, M.A., Vanderburg, R. and Vanderburg, M. (2023). Implementing educational technology in Higher Education Institutions: A review of technologies, stakeholder perceptions, frameworks and metrics. *Education and Information Technologies, 28,* 16403–16429, https://doi.org/10.1007/s10639-023-11846-x

Complete University Guide (2024, February 3). *UK University Profiles.* Complete university guide. https://www.thecompleteuniversityguide.co.uk/universities

Data Protection Act (2018), *Data Protection Act 2018*. Retrieved February 3, 2024, from https://www.legislation.gov.uk/ukpga/2018/12/contents/enacted.

Dawson, P. (2017). Assessment rubrics: towards clearer and more replicable design, research and practice. *Assessment & Evaluation in Higher Education, 42*(3), 347-360, https://doi.org/10.1080/02602938.2015.1111294

Demir, F., Bruce-Kotey, C. & Alenezi, F. (2022). User Experience Matters: Does One size Fit all? Evaluation of Learning Management Systems. *Technology, Knowledge and Learning, 27,* 49–67. https://doi.org/10.1007/s10758-021-09518-1

Devisakti, A. and Muftahu, M. (2023). Digitalization in higher education: does personal innovativeness matter in digital learning? *Interactive Technology and Smart Education, 20*(2), 257-270. https://doi.org/10.1108/ITSE-10-2021-0182

Dickinson, P., & Adams, J. (2017). Values in evaluation – The use of rubrics. *Evaluation and Program Planning*, *65*, 113-116. https://doi.org/10.1016/j.evalprogplan.2017.07.005

Du, Y. & Gao, H. (2022). Determinants affecting teachers' adoption of AI-based applications in EFL context: An analysis of analytic hierarchy process. *Education and Information Technologies, 27*, 9357–9384. https://doi.org/10.1007/s10639-022-11001-y

Duman B. & Oğuz T. (2024). Academicans' Perceptions Towards Online Teaching Tools Within the Context of the Unified Theory of Acceptance and Use of Technology-2 (UTAUT-2). *Pegem Journal of Education and Instruction, 14*(1), 150-166. https://doi.org/10.47750/pegegog.14.01.18

Garone, A., Pynoo, B., Tondeur, J., Cocquyt, C., Vanslambrouck, S., Bruggeman, B. & Struyven, K. (2019). Clustering university teaching staff through UTAUT: Implications for the acceptance of a new learning management system. *British Journal of Educational Technology, 50*(5), 2466-2483. https://doi.org/10.1111/bjet.12867

Glushenkova, M., & Zagato, M. (2023). Effect of COVID-19 on digitalisation of higher education. A tale of one business school. *Journal of University Teaching & Learning Practice, 20*(6), 1-19. https://doi.org/10.53761/1.20.6.10

González, C. (2010). What do university teachers think eLearning is good for in their teaching? *Studies in Higher Education, 35*(1), 61-78, https://doi.org/10.1080/03075070902874632

Granic, & Marangunic, N. (2019). Technology acceptance model in educational context: A systematic literature review. *British Journal of Educational Technology, 50*(5), 2572–2593. https://doi.org/10.1111/bjet.12864

Granić, A. (2022). Educational Technology Adoption: A systematic review. *Education and Information Technologies, 27*, 9725–9744. https://doi.org/10.1007/s10639-022-10951-7

Gruzd, A., Staves, K., & Wilk, A. (2012). Connected scholars: Examining the role of social media in research practices of faculty using the UTAUT model. *Computers in Human Behavior, 28*(6), 2340-2350. http://doi.org/10.1016/j.chb.2012.07.004

Guardian (2023), *The best UK universities 2023 – rankings*. Retrieved February 3, 2024 from https://www.theguardian.com/education/ng-interactive/2022/sep/24/the-guardian-university-guide-2023-the-rankings.

Hsu, L. (2016). Examining EFL teachers' technological pedagogical content knowledge and the adoption of mobile-assisted language learning: A partial least square approach. *Computer Assisted Language Learning, 29*(8), 1287–1297. https://doi.org/10.1080/09588221.2016.1278024

Hu, P., Clark, T., & Ma, W. (2003). Examining technology acceptance by school teachers: a longitudinal study. *Information and Management, 41*, 227-241. http://doi.org/10.1016/S0378-7206(03)00050-8

Hu, S., Laxman, K. & Lee, K. (2020). Exploring factors affecting academics' adoption of emerging mobile technologies-an extended UTAUT perspective. *Education & Information Technologies, 25*, 4615–4635. https://doi.org/10.1007/s10639-020-10171-x

Jones, L., Allen, B., Dunn, P. & Brooker, L. (2017). Demystifying the rubric: a five-step pedagogy to improve student understanding and utilisation of marking criteria. *Higher Education Research & Development, 36*(1), 129-142. https://doi.org/10.1080/07294360.2016.1177000

Jung, I., & Lee, Y. (2015). YouTube acceptance by university educators and students: A cross-cultural perspective. *Innovations in Education and Teaching International, 52*(3), 243-253. http://doi.org/10.1080/14703297.2013.805986

Kaewsaiha, P., & Chanchalor, S. (2021). Factors affecting the usage of learning management systems in higher education. *Education & Information Technologies, 26*, 2919–2939. https://doi.org/10.1007/s10639-020-10374-2

Khlaif, Z. (2018). Teachers' Perceptions of Factors Affecting Their Adoption and Acceptance of Mobile Technology in K-12 Settings. *Computers in the Schools, 35*(1), 49-67. https://doi.org/10.1080/07380569.2018.1428001

Lu, H., & Yang, Y. (2014). Toward an understanding of the behavioral intention to use a social networking site: An extension of task-technology fit to social-technology fit. *Computers in Human Behavior, 34*, 323-332. https://doi.org/10.1016/j.chb.2013.10.020

Matarirano, O., Jere, N. R., Sibanda, H. S., & Panicker, M. (2021). Antecedents of Blackboard Adoption by Lecturers at a South African Higher Education Institution – Extending GETAMEL. *International Journal of Emerging Technologies in Learning (iJET)*, *16*(01), 60–79. https://doi.org/10.3991/ijet.v16i01.16821

Mei, B., Brown, G. T. L., & Teo, T. (2017). Toward an understanding of preservice English as a foreign language teachers' acceptance of computer-assisted language learning 2.0 in the people's republic of China. *Journal of Educational Computing Research, 56*(1), 74-104. https://doi.org/10.1177/0735633117700144

Modise, M., & Molotsi, A. (2022). The perceptions of new lecturers towards adopting a learning management system for facilitating modules online in a South African ODeL institution. *International Journal of Education and Development using ICT*, *18*(1). http://ijedict.dec.uwi.edu/viewarticle.php?id=3016.

Mujalli, A.; Khan, T.; Almgrashi, A. (2022). University Accounting Students and Faculty Members Using the Blackboard Platform during COVID-19; Proposed Modification of the UTAUT Model and an Empirical Study. *Sustainability, 14*(4), 2360, 1-18. https://doi.org/10.3390/su14042360

Muries, B., & Masele, J. J. (2017). Explaining Electronic Learning Management Systems (ELMS) Continued Usage Intentions among Facilitators in Higher Education Institutions (HEIs) in Tanzania. *International journal of education and development using information and communication technology, 13(1)*, 123-141. http://ijedict.dec.uwi.edu/viewarticle.php?id=2247

Nikou, S., & Aavakare, M. (2021). An assessment of the interplay between literacy and digital Technology in Higher Education. *Education & Information Technologies, 26,* 3893–3915. https://doi.org/10.1007/s10639-021-10451-0

Nistor, N. (2014). When technology acceptance models won't work: non-significant intention-behavior effects. *Computers in Human Behavior, 34*, 299-300. https://doi.org/10.1016/j.chb.2014.02.052

Nistor, N., Baltes, B., Dascălu, M., Mihăilă, D., Smeaton, G., & Trăuşan-Matu, Ş. (2014). Participation in virtual academic communities of practice under the influence of technology acceptance and community factors. A learning analytics application. *Computers in Human Behavior, 34*, 339-344. https://doi.org/10.1016/j.chb.2013.10.051

O'Dea, X., & O'Dea, M. (2023). Is Artificial Intelligence Really the Next Big Thing in Learning and Teaching in Higher Education? A Conceptual Paper. *Journal of University Teaching & Learning Practice, 20*(5), 1-17. https://doi.org/10.53761/1.20.5.05

Oye, N., Iahad, N., & AbRahim, N. (2014). The history of UTAUT model and its impact on ICT acceptance and usage by academicians. *Education and Information Technologies, 19*(1), 251-270. http://doi.org/10.1007/s10639-012-9189-9

Panadero, E., & Jonsson, A. (2020). A critical review of the arguments against the use of rubrics. *Educational Research Review*, *30*, 100329, 1-19. https://doi.org/10.1016/j.edurev.2020.100329

Pynoo, B., Devolder, P., Tondeur, J., van Braak, J., Duyck, W., & Duyck, P. (2011). Predicting secondary school teachers' acceptance and use of a digital learning environment: A cross-sectional study. *Computers in Human Behavior, 27*(1), 568-575. http://doi.org/10.1016/j.chb.2010.10.005

Reddy, Y. and Andrade, H. (2010). A review of rubric use in higher education. *Assessment & Evaluation in Higher Education*, *35*(4), 435-448. https://doi.org/10.1080/02602930902862859

Rogers, P. (2000). Barriers to adopting emerging technologies in education. *Journal of Educational Computing Research, 22*(4), 455-472. http://doi.org/10.2190/4UJE-B6VW-A30N-MCE5

Rondan-Cataluña, F.J., Arenas-Gaitán, J., Ramírez-Correa, P. E. (2015). A comparison of the different versions of popular technology acceptance models: A non-linear perspective. *Kybernetes, 44*(5), 788-805. https://doi.org/10.1108/K-09-2014-0184

Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers and Education, 128*, 13–35. https://doi.org/10.1016/j.compedu.2018.09.009

Sherer, R., Howard, S., Tondeur, J., & Siddiq, F. (2021). Profiling teachers' readiness for online teaching and learning in higher education: Who's ready? *Computers in Human Behavior, 118*, 106675. http://doi.org/10.1016/j.chb.2020.106675

Sulaiman, T. T. (2024). A systematic review on factors influencing learning management system usage in Arab gulf countries. *Education Information Technologies, 29*, 2503–2521. https://doi.org/10.1007/s10639-023-11936-w

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino. S. V., Giannoutsou, N., Cachia, R., Monés, A. M. & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education*

and Information Technologies, 28(6), 6695-6726. https://doi.org/10.1007/s10639-022-11431-8

Turner, M., Kitchenham, B., Brereton, P., Charters, S., & Budgen, D. (2010). Does the technology acceptance model predict actual use? A systematic literature review. *Information and Software Technology, 52*, 463–479. https://doi.org/10.1016/j.infsof.2009.11.005

Venkatesh, V., Morris, M., Davis, G. & Davis, F. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS quarterly*, *27* (3), 425–478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J. & Xu, X. (2016). Unified Theory of Acceptance and Use of Technology: A Synthesis and the Road Ahead. *Journal of the Association for Information Systems, 17*(5), 328–376. Available at SSRN: https://ssrn.com/abstract=2800121

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), 157-178. Available at SSRN: https://ssrn.com/abstract=2002388

Yin, R. K. (2018). *Case study research and applications* (Vol. 6). Thousand Oaks, CA: Sage.

Zwain, A. A. A. (2019). Technological innovativeness and information quality as neoteric predictors of users' acceptance of learning management system: An expansion of UTAUT2. *Interactive Technology and Smart Education*, *16*(3), 239-254. https://doi.org/10.1108/ITSE-09-2018-0065