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Determinant Factors Influencing Intention to Use IoT Among Academics

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Abstract: The adaptation and adoption of IoT devices in education have gathered a lot of interest, especially with the ongoing transformation of teaching and learning processes into the digital world. The pandemic period has boosted the need for digital solutions in education, further marking the role of IoT remodel towards achieving educational goals. This research focuses on the factors that impact lecturers' intention to use IoT at the Universiti Teknologi MARA (UiTM), Selangor Campus. This study has categorized the factors that define lecturers' acceptance of IoT using the UTAUT model. A structured questionnaire was used to collect data from 140 lecturers at UiTM Selangor as part of a survey. The study investigates the linkage between Social Influence, Facilitating Conditions, Knowledge and Skills, Effort Expectancy, and IT capability with IoT adoption intentions. The results help in understanding interrelations among variables included in this study and provide educational leaders with important information needed to create policies that support instructors adopting IoT-based instruction. This research is aimed at addressing the gaps identified through studies in post post-COVID-19 era and provides ways to improve the learning experience and the level of education achieved in the post-pandemic academic landscape.

Keywords: *Internet of Things, Unified Theory of Acceptance and Technology (UTAUT), social influence, facilitating conditions, IT capability.*

1. Introduction

The adoption of the Internet of Things is transforming education into a more sophisticated and streamlined process (Ghashim & Arshad, 2023; Tripathi & Ahad, 2018). As we have seen, IoT is already enhancing academics and school-related activities by automating routine processes and enabling real-time monitoring and communication (Das, 2025). The Articles on AI and Education Pdf (n.d.) and Daniela (2021) cited the rush towards the adaptation of digital technologies for maintaining quality education during the COVID-19 pandemic, explaining how the IoT adoption accelerated due to the pandemic.

Professors can enhance courses and deliver immediate personalized responses for interactive displays and sensors. Through Mowade (2024), we see the IoT has a positive impact on effective resource allocation, refining institutional security measures, advanced teaching, and overall helping create a more inclusive adaptive environment. This has led to a growing recognition of IoT's potential to improve educational experiences for lecturers and students alike (Ghashim & Arshad, 2023). Concerning the increasing number of IoT devices in the teaching sector, it brings along the challenge in the management of security, transparency, and data associated with the new opportunities of vast amounts of information being generated (Mowade, 2024).

Despite the potential, the introduction of the IoT in the field of education also presents quite a few challenges. One of the main issues is the absence of clear frameworks to guide IoT adoption in many countries, which makes it difficult to achieve smooth integration across devices and platforms. This issue is exacerbated by the absence of standards and governance for interoperability, which complicates things further (Noura et al., 2018). Financial limitations are also an obstacle, as utilization of IoT always involves heavy investment in infrastructure and retraining of lecturers (Al-Emran, 2020). Privacy and security continue to be major concerns, as IoT applications often deal with sensitive information. This highlights the need for clear and robust policies that safeguard data and promote ethical use (Yang et al., 2017).

To better understand the factors influencing IoT adoption in education, the Unified Theory of Acceptance and Use of Technology (UTAUT) provides a useful lens. UTAUT highlights constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions, all of which play an important role in shaping lecturers' willingness to adopt IoT (Mukherjee, 2021). Although the model offers flexibility, it does

not fully capture the educational and cultural contexts of institutions like Universiti Teknologi MARA (UiTM), nor does it adequately represent Malaysia's distinctive teaching and learning practices (Nain et al., 2021). This indicates the need for further research to explore the development of IoT adoption in higher education and to identify practical strategies that can support lecturers in addressing these challenges.

2. Literature Review

Lecturers spend a substantial amount of their time within the workplace, the surrounding environment has a significant impact on their overall productivity (Hafee et al., 2019). In a higher education setting, a lecturer's willingness to adopt the Internet of Things (IoT) may be shaped by various factors such as social influence, available support and resources, individual knowledge and skills, perceived ease of use, and the institution's IT capability. In this study, these five aspects are treated as the independent variables, whereas the intention to utilize IoT serves as the dependent variable.

Social Influence

Unified Theory of Acceptance and Use of Technology (UTAUT), social influence is defined as the extent to which an individual's decision to adopt IoT is shaped by organizational and external pressures (Venkatesh et al., 2003). This perspective emphasizes that adoption is not solely determined by personal interest but is also influenced by the opinions of others, prior positive experiences, and compliance with regulatory or legal requirements (Jaradat et al., 2020). In an organizational context, leadership support and peer encouragement are important in fostering adoption. Institutions that position IoT as a strategic priority, while providing adequate resources, training, and incentives, tend to achieve higher levels of implementation (Ane et al., 2020). Supportive institutional culture fosters innovation, encourages knowledge exchange, and strengthens the integration of IoT into academic practices (Tobarra et al., 2021). Thus, social influence captures the degree to which surrounding groups shape an individual's perception and acceptance of technology (Venkatesh et al., 2003).

H1: There is a positive impact of social influence and how the Internet of Things helps teaching and learning skills among academics.

Facilitating Conditions

Facilitating conditions are defined to which individuals believe that sufficient organizational and technical infrastructure exist to support system usage (Venkatesh et al., 2003). In addition, these conditions influence a lecturer's willingness to adopt IoT when reliable support mechanisms, such as prompt assistance in addressing technical difficulties (Daud Mahande, n.d.). On the other hand, Venkatesh et al. (2003) argued that facilitating conditions do not directly influence behavioral intention; they can significantly affect actual system use, particularly when factors such as age and prior experience are considered.

Organizational and technical structures, therefore, serve as a critical foundation for IoT adoption. This involves ensuring that lecturers have access to the necessary resources, offering effective technical support, and developing institutional policies that encourage technological advancement. Moreover, creating a collaborative teaching environment that encourages knowledge sharing can improve lecturers' readiness to integrate IoT into their practice (Dachyar et al., 2019). Such as enabling conditions are essential to ensure that lecturers are well-equipped to effectively use IoT in teaching and learning.

H2: There is a positive impact of facilitating conditions on intention to use the Internet of Things (IoT).

Knowledge and Skills

Knowledge and skills are important in the adoption of IoT technologies, as users' ability to operate IoT applications and their understanding of the technology directly shape their behavior and intention to adopt it (Ronoh et al., 2021). Prior studies indicate that individuals who feel confident and comfortable in using IoT devices are more likely to embrace the technology (Ganiyu, 2019). The importance of designing IoT systems with simple, intuitive interfaces to enhance usability and encourage adoption. Hence, context of teaching and learning, this perspective supports the assumption that lecturers with stronger knowledge and technical skills are more inclined to integrate IoT into their practices.

H3: There is a positive impact of knowledge and skills, and the intention to use the Internet of Things (IoT) in teaching and learning.

Effort Expectancy

In the Unified Theory of Acceptance and Use of Technology (UTAUT), effort expectancy can be defined as the perceived ease of using a particular technology, which strongly influences the likelihood of its adoption. The simpler a technology appears to learn and apply, the greater the probability that individuals will accept and engage with it (Venkatesh et al., 2003). A lower level of perceived effort increases the likelihood of adoption, as effort expectancy refers to the point at which users believe they must exert effort to use the technology effectively (Im et al., 2011). This construct is therefore essential in understanding how perceptions of usability affect an individual's readiness to integrate technology into daily tasks or professional practices.

In the context of higher education, effort expectancy has been shown to positively affect lecturers' intention to use IoT in teaching and learning (Madzamba, 2023). Perceptions of ease of use are influenced by several factors such as accessibility, prior familiarity, training opportunities, integration with pedagogical practices, and the availability of technical support (Riad et al., 2020). When lecturers perceive IoT as user-friendly and easy to integrate, their intention to adopt it in teaching increases considerably. On the other hand, this is consistent with prior findings that highlight the central role of perceived ease of use in technology adoption (Dachyar et al., 2019). The convenience and simplicity of using IoT are key factors influencing lecturers' behavioral intentions to adopt the technology at UiTM (Selangor Campus).

H4: There is a positive impact of effort expectancy and intention to use the Internet of Things (IoT) in teaching and learning.

IT Capability

IT capability refers to the ability, whether at the organizational or individual level, that leads to acquire and effectively utilizing technology to achieve specific objectives (Tobarra et al., 2021). In the context of IoT, this capability is important in enhancing lecturers' performance. For example, IoT can support the development of smart classrooms, where interconnected devices become more efficient, engaging, and interactive teaching and learning experiences. It can also assist in monitoring classroom environments, enabling lecturers to adjust teaching strategies and resources for better outcomes (Ganiyu, 2019). Furthermore, IoT facilitates the use of adaptive learning platforms and smart educational devices, while promoting collaboration that also allows lecturers and students to share resources and work together even when in different locations. These applications have the potential to improve both the reach and quality of teaching and learning.

However, successful integration of IoT depends not only on access to the technology but also on adequate pedagogical training and support for lecturers (Attuquayefio, 2014). Based on the drawing in Unified Theory of Acceptance and Use of Technology (UTAUT), IT capability is the main important determinant of technology adoption. This includes competencies such as computer literacy, prior IT experience, training received, confidence in carrying out IT-related tasks, willingness to learn, and access to proper support and infrastructure (Venkatesh et al., 2003). On the other hand, additional aspects such as IT compatibility, social interaction, and the ability to overcome technical barriers further influence the likelihood of IoT adoption.

H5: There is a positive impact of IT capability and the intention to use the Internet of Things (IoT).

Intention to Use IoT

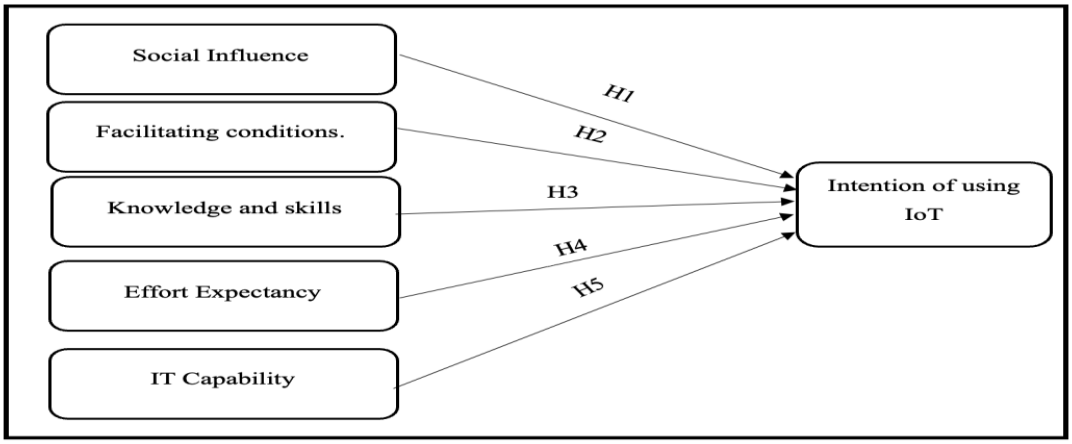
The Internet of Things (IoT) has great potential to transform education by creating more interactive and technology-driven learning experiences that bring benefits for both students and educators. Not only within their advantages, but challenges can also be seen in balancing technological transformation with educators' readiness. Many educators may not yet feel fully equipped to integrate IoT into their teaching practices or in daily tasks. This highlights the need for stronger efforts to increase educators' intention and confidence in adopting IoT as part of their instructional methods (Goubeaud & Yan, 2024).

Educator preparedness is a central factor influencing the intention to adopt IoT. Educators can integrate existing technologies into their work, their openness or willingness to change, and their capacity to adapt to new technological tools (Aloufi et al., 2024). When teachers possess these qualities, they are more likely to embrace and explore IoT, thereby facilitating the effective integration into pedagogy. In turn, this readiness can accelerate the adoption of more advanced IoT applications in education and support the ongoing digital transformation of teaching and learning.

Conceptual Framework

Based on the literature, the conceptual framework for this study is presented in Figure 1.

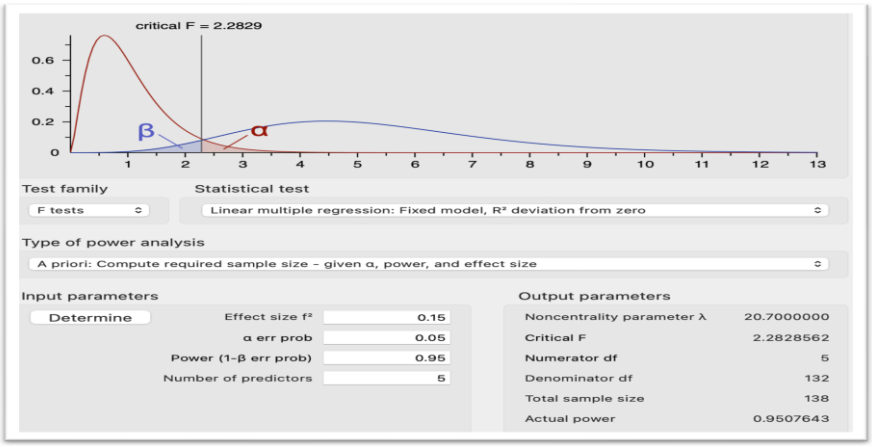
Figure 1: Conceptual Framework



3. Methodology

This study applies the quantitative approach to determine factors influencing the intention to use IoT among academics in UiTM Selangor Campus. This research's sampling frame comprises all campuses in Selangor, which are 6 branches, including Shah Alam Campus, Puncak Alam Campus, Selayang Campus, Dengkil Campus, Sungai Buloh Campus and Puncak Perdana Campus. Sample size can be determined as a technique of selecting a few members from the population characteristic. f define a sample as a subset of the population. Hence, this study utilizes a sample size calculator provided by G*Power software to estimate the minimal sample size required for this investigation. G*Power software is a program that assists in computing effect sizes and graphically displaying power analysis results. F test with multiple linear regression and Fixed model R2 deviation from zero were carried out on the G*Power. Assuming a data error of 0.05 and a power of 0.95, with a maximum of 5 predictors, the result indicates that a total of 138 respondents must be collected as a minimum sample size in this study.

Figure 2: G*Power for sample size



Based on Figure 2, the sample for the study is 140 lecturers. Selected respondents are chosen by the simple Random Sampling Technique. The data collection of this research is via Questionnaires that were also distributed via email and WhatsApp. The researcher employed a structured questionnaire adapted from past studies, designed to align with the research objectives. The questionnaire utilized closed-ended questions in English. It was structured into three sections: Section A focused on demographic details such as gender, age,

teaching experience, campus, and experience of using the Internet of Things. Section B examined independent variables (social influence, facilitating conditions, skills and knowledge, effort expectancy, and IT capability); Section C evaluated intention to use IoT (dependent variable).

Data analysis, defined as the process of inspecting, cleaning, and modelling data to discover useful information, draw conclusions, and support decision-making, was conducted using Statistical Package for the Social Sciences (SPSS) version 28.0. The first step involved addressing issues such as blank responses, straight-lining, and outliers. Blank responses were removed, while participants exhibiting straight-lining behaviors were excluded. Outliers were identified and handled to ensure the data remained within reasonable bounds. After the data is cleaned, it undergoes several stages of analysis, including descriptive statistics, normality testing, correlation, and regression analysis. The conclusion provided a summary of the overall research design, which encompassed the sampling approach and data analysis procedures. The methodology is both rigorous and reliable, allowing the collected data to effectively address the research objectives (Sekaran, 2016).

4. Findings and Results

For the actual study, a total of 150 survey responses were collected. In order to ensure accuracy and reliability, the dataset underwent a rigorous cleaning process, which involved applying predefined criteria and eliminating incomplete or inconsistent responses. Following the flow of the step, 140 valid responses were retained for analysis. The final sample size (n = 140) exceeds the minimum required sample of 128, confirming that the dataset is adequate for producing meaningful and reliable conclusions.

Respondents' Profile and Characteristics

The table below shows a summary of the demographic characteristics of the respondents, which also highlights their gender, age, teaching experience, campus affiliation, and prior exposure to the Internet of Things (IoT). In terms of gender, 70.7% (n = 99) of the respondents were female, while 29.3% (n = 41) were male, indicating a greater level of female participation in the survey. With respect to age, the largest proportion of respondents (50%, n = 70) fell within the 36–45 years category, followed by 30% (n = 42) who were aged 46 years and above, and 20% (n = 28) who were between 25–35 years old. This distribution reflects a predominance of middle-aged participants. Regarding teaching experience, the largest group consisted of respondents with 11–15 years of experience (27.9%, n = 39), closely followed by those with more than 16 years of experience (27.1%, n = 38). Meanwhile, 23.6% (n = 33) reported having 1–5 years of teaching experience, and 21.4% (n = 30) had 6–10 years, suggesting that the sample represents a well-balanced spread of teaching expertise across different career stages.

Campus-wise, the majority of respondents were from Shah Alam (42.9%, n=60) and Puncak Alam (30.7%, n=43). Smaller proportions represented Dengkil (9.3%, n=13), Selayang (6.4%, n=9), Sungai Buloh (5.7%, n=8), and Puncak Perdana (5%, n=7), with Shah Alam and Puncak Alam contributing significantly to the survey results. In terms of IoT usage, the data reveal a high engagement, with 89.3% (n=125) of respondents using IoT technology daily.

A smaller percentage (6.4%, n=9) reported using IoT once a week, while 2.1% (n=3) indicated usage once a month, and another 2.1% (n=3) stated they never used it. This illustrates a strong reliance on IoT technology in their daily activities and highlights its importance to the respondents. Overall, the demographic profile provides a comprehensive overview of the respondents and their attributes, which are essential for interpreting the study's findings.

Table 1: The Respondents' Profile and Characteristics

Frequency Analysis	Category	Percentage (%)	Frequency
Gender	Male Female	29.3 %	**41**
		70.7 %	**99**
Age	25-35 Years Old	20 %	**28**
	36-45 Years Old	50 %	**70**
	46 Years Old and Above	30 %	**42**
Teaching Experience	1-5 years	23.6 %	**33**
	6-10 years	21.4 %	**30**
	11 – 15 years More than 16	27.9 %	**39**
	years	27.1 %	**38**
Campus	Shah Alam	42.9 %	**60**
	Puncak Alam	30.7 %	**43**
	Puncak Perdana	5 %	**7**
	Dengkil	9.3 %	**13**
	Selayang	6.4 %	**9**
	Sungai Buloh	5.7 %	**8**
Experience using the	Once a week, every day	6.4 %	**9**
Internet of Things	Once a month, never	89.3 %	**125**
		2.1 %	**3**
		2.1 %	**3**

Descriptive Analysis

Table 2 shows descriptive analysis of factors influencing IoT adoption among lecturers at UiTM (Selangor Campus), revealing positive findings. The mean score for Social Influence was 4.08 (SD = 0.640), indicating a significant influence from peers and the institutional environment on IoT adoption. Facilitating Conditions received a mean of 3.85 (SD = 0.637), suggesting that while resources and support are moderately favorable, improvements are still needed. Skills and Knowledge had the highest mean at 4.41 (SD = 0.489), showing that lecturers feel confident in their understanding and ability to implement IoT. Effort Expectancy scored 4.20 (SD = 0.532), reflecting that IoT systems are seen as easy to operate and integrate with existing systems. IT Capability was rated at 4.37 (SD = 0.569), indicating that the technological infrastructure at UiTM is viewed positively. Finally, the intention to use IoT recorded a mean score of 4.32 (SD = 0.598), which indicates a strong willingness among lecturers to incorporate IoT into their teaching practices. From the table shown, overall, the findings suggest that lecturers exhibit a high level of readiness and confidence in adopting IoT. The results also highlight the need to strengthen facilitating conditions to further support and streamline the adoption process.

Table 2: Means and Standard Deviations

Variables	N	Mean	Std. Deviation
Social Influence	140	4.08	**.640**
Facilitating Conditions	140	3.85	**.637**
Skills and Knowledge	140	4.41	**.489**
Effort Expectancy	140	4.20	**.532**
IT Capability	140	4.37	**.569**
Intention to use IoT	140	4.32	**.598**

Correlation Analysis

Correlation is a statistical technique used to measure the strength and direction of the relationship between two variables that indicating how changes in one variable are associated with changes in the other. The

correlation coefficient ranges from −1 to +1. A value of +1 reflects a perfect positive relationship, where are increase in one variable corresponds directly with an increase in the other. In contrast, a value of −1 indicates a perfect negative relationship, meaning that as one variable increases, the other decreases proportionally. A correlation of 0 suggests no linear relationship between the variables, implying that changes in one do not predict changes in the other. Pearson's correlation coefficient is one of the widely applied methods for examining linear relationships between continuous variables that offering useful insights for statistical modeling, hypothesis testing, and predictive analysis.

Table 3: Correlation Analysis

Variables	1	2	3	4	5	6
Social Influence	**1**	.419**	.453**	.462**	.355**	**.530****
Facilitating Conditions		**1**	.503**	.656**	.566**	**.633****
Skills and Knowledge			**1**	.690**	.663**	**.688****
Effort Expectancy				**1**	.720**	**.737****
IT Capability					**1**	**.767****
Intention to use IoT						**1**

The results of the correlation analysis offer important insights into the relationships between the independent variables, which are Social Influence, Facilitating Conditions, Skills and Knowledge, Effort Expectancy, and IT Capability and the dependent variable, Intention to Use IoT. All five independent variables were found to have statistically significant positive correlations with the dependent variable, indicating that these factors meaningfully contribute to shaping individuals' intention to adopt IoT.

Social Influence showed a moderate positive correlation with Intention to Use IoT ($r = 0.530$, $p < 0.01$), suggesting that peer expectations, organizational norms, and external encouragement play a considerable role in influencing lecturers' adoption behaviour. Next, Facilitating Conditions exhibited a stronger correlation ($r = 0.633$, $p < 0.01$), which emphasizes that the availability of infrastructure, resources, and institutional support substantially increases the likelihood of lecturers adopting IoT in their teaching practices.

Similarly, Skills and Knowledge exhibit a strong positive correlation ($r = 0.688$, $p < 0.01$), indicating that individuals who are more knowledgeable and skilled in IoT-related technologies are more inclined to adopt them. Next, Effort Expectancy indicates an even stronger positive correlation ($r = 0.737$, $p < 0.01$), showing that when IoT systems are perceived as easy to use means individuals' intention to adopt them increases significantly. Among all the variables, IT Capability has the strongest relationship with Intention to Use IoT ($r = 0.767$, $p < 0.01$). It indicates that advanced technological infrastructure and expertise are the most important variables in driving IoT adoption.

Multiple Regression Analysis

The multiple regression analysis revealed that $R^2 = 0.722$, indicating that 72.2% of the variance in the Intention to Use IoT can be explained by the independent variables. The Adjusted R^2 value was 0.712, and the F-value was 69.651 ($p < 0.001$), showing that the model is statistically significant. Among the predictors, IT Capability emerged as the strongest predictor with a standardized coefficient (ß) of 0.400, $t = 5.676$ ($p < 0.001$). Social Influence also significantly impacted IoT adoption with ß = 0.182, $t = 3.421$ ($p < 0.001$). Facilitating Conditions had a significant relationship with IoT adoption (ß = 0.145, $t = 2.332$, $p = 0.021$), as did Skills and Knowledge (ß = 1.54, $t = 2.265$, $p = 0.025$). Lastly, Effort Expectancy contributed moderately to IoT adoption with ß = 0.163, $t = 2.066$ ($p = 0.041$).

These results suggest that while IT Capability and Social Influence are the strongest predictors, Facilitating Conditions, Skills and Knowledge, and Effort Expectancy also play important roles in the adoption of IoT.

Table 4: Multiple Regression Analysis

Model	Unstandardized Coefficient		Standardized Coefficient	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.343	.264		-1.300	**.196**
Social Influence	.170	.050	.182	3.421	**<.001**
Facilitating Conditions	.136	.058	.145	2.332	**.021**
Skills and Knowledge	.189	.083	1.54	2.265	**.025**
Effort Expectancy	.183	0.89	.163	2.066	**.041**
IT Capability	**.421**	**.074**	**.400**	**5.676**	**<.001**
F value			**69.651**		
Sig			<.001b		
Adjusted R2			.712		
R2			**.722**		

Discussion

The findings suggest that lecturers' willingness to integrate IoT into their teaching is strongly influenced by the support they receive from colleagues and their institution (Hassan et al., 2020). The results above clearly show that the more encouragement and endorsement lecturers feel, the more likely they are to adopt IoT. This process can be compared to a team effort, in which lecturers become more motivated and confident to use IoT when they know they have the support of peers and leaders. This aligns with previous studies that emphasize that a positive and collaborative environment is important for successful technology adoption. The present analysis further confirms that social influence plays a key role, meaning the greater support directly increases the likelihood of IoT adoption (Hashim & Al-Sulami, 2020). Therefore, increasing teamwork and creating a supportive atmosphere is important for encouraging educators to embrace new technologies and building smarter can lead to more efficient learning environments.

These results also highlight the importance of institutional initiatives such as peer-sharing seminars, training sessions, and leadership-driven promotion of IoT usage, which these activities can strengthen adoption rates. Social factors such as particularly teamwork, peer encouragement, and leadership endorsement will remain central in motivating lecturers to incorporate IoT into teaching practices.

Analysis for facilitating conditions shows more refined details. Facilitating conditions refer to the resources, infrastructure, and institutional support that lead lecturers to adopt IoT. Although the results indicate a positive correlation between facilitating conditions and intention to adopt IoT, the regression analysis and hypothesis testing (H2) show that neither condition has a statistically significant effect on lecturers' behavioral intentions. This outcome also suggests that while resources and infrastructure are necessary, they are not sufficient on their own to drive adoption. Consistent with earlier studies, performance expectancy, perceived usefulness, enjoyment, and social influence appear to play a greater role in shaping intention compared to support conditions.

This outcome finding indicated that lecturers perceive enabling conditions as a baseline requirement rather than a motivating factor. In other words, adequate infrastructure and support must be in place; they may not be enough to encourage adoption unless lecturers also possess strong IT skills, interpersonal competencies, and confidence in their ability to use IoT effectively.

In summary, facilitating conditions are important for creating an environment where IoT can function; they do not directly determine adoption. For effective IoT integration in higher education, institutions should not only provide resources and infrastructure but also focus on enhancing lecturers' IT capabilities, strengthening social influence, and building confidence and motivation to use the technology.

The analysis examined the relationship between lecturers' knowledge and skills and their intention to adopt IoT in teaching. The findings show a strong positive correlation, indicating that as lecturers' expertise in IoT increases, so does their intention to integrate it into their teaching practices. To go deeper, this highlights the importance of technical competence and confidence in overcoming barriers to IoT adoption. However, both the literature review and regression analysis suggest that knowledge and skills alone do not serve as strong predictors of adoption. While they are necessary, lecturers with sufficient technological expertise may not view them as primary motivators. Instead, other factors such as perceived usefulness, enjoyment, and social influence appear to exert a stronger influence on adoption behavior (Aziz et al., 2023). Consequently, Hypothesis H3, which proposed that knowledge and skills have a positive impact on IoT adoption, was not supported. These results imply that knowledge and skills, though essential, are not sufficient on their own to drive adoption. A supportive environment that comprises institutional infrastructure, peer encouragement, and social influence, which is equally important in fostering lecturers' willingness to fully embrace IoT in their teaching practices.

Although these studies have consistently shown that effort expectancy significantly influences lecturers' intention to adopt IoT in teaching, the results of this study present a different perspective. Hypothesis H4, which proposed that effort expectancy positively influences IoT adoption, was not supported. This suggests that while effort expectancy correlates with adoption, its independent effect is not strong enough to drive it. Lecturers appear to regard ease of use as a fundamental expectation rather than a motivating factor. In other words, they assume that IoT tools should naturally be user-friendly and thus do not view this attribute as a compelling reason to adopt them. Instead, other factors such as institutional support, perceived usefulness, and social influence. Therefore, effort expectancy should be seen as a facilitating condition rather than a primary driver. To strengthen IoT adoption, institutions must ensure that IoT technologies are simple and intuitive, while also providing sufficient resources, boosting technical confidence, and cultivating a supportive teaching culture.

In contrast, the findings highlight IT capability as the most significant predictor of IoT adoption. IT capability, which encompasses access to technological infrastructure, resources, and technical expertise, demonstrates a strong positive correlation with lecturers' intention to adopt IoT in their teaching. On the other hand, regression analysis further supports this result, showing that IT capability has a greater influence on adoption than any other factor. Lecturers who feel good in their IT skills are more likely to perceive IoT as both useful and manageable, reducing hesitation and increasing adoption rates. Hypothesis H5, which stated that IT capability positively influences IoT adoption, was fully supported.

These results underscore the important role of IT infrastructure and technical support in educational institutions. Without adequate resources and expertise, integrating IoT into teaching becomes challenging, even for motivated lecturers. Conversely, when strong IT capability is in place, lecturers are empowered to use IoT effectively, aligning with prior studies that identify IT competence as a key driver of adoption (Bahari et al., 2024).

5. Conclusion and Recommendations

In conclusion, those lecturers who successfully adopt IoT in teaching, universities need to focus on the key elements identified in the UTAUT model (Almetere et al., 2020). This clearly shows how IoT can improve teaching performance, making sure the technologies are easy to use, encouraging collaboration among peers, and providing the right resources and technical support. At the same time, ethical and security issues should not be overlooked, as building trust is important for long-term adoption. Ultimately, what makes the difference is a proactive and open attitude toward technology that is supported by institutions that are ready to guide and equip their lecturers. It can be seen, through this combination, that IoT has the potential to truly transform the teaching and learning environment into something more dynamic, engaging, and efficient.

Based on the findings, several practical may can help lecturers make a move to embrace IoT in their teaching. One of the most important is strengthening IT skills and confidence through continuous professional development. It can start from a simple thing, such as training or workshops. By doing so, lecturers not only expand their technical knowledge but also feel more prepared to experiment with new teaching methods. It is important for lecturers to make use of institutional support systems such as IT teams and technology resources since these can help troubleshoot issues and recommend the most suitable IoT tools. Peer collaboration adds another layer of support; learning from colleagues who have already experimented with IoT can provide valuable insights and encouragement. A gradual approach is also helpful, starting with simpler, user-friendly applications before moving on to more advanced tools ensures that confidence builds steadily over time. Above all, maintaining an open and proactive mindset is key. When lecturers embrace technology with curiosity and a willingness to adapt, IoT becomes less of a challenge and more of an opportunity to enhance the classroom experience for both educators and students.

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