A Study on the Perception and Readiness of PolyCC Kedah-Perlis Lecturers Towards the LMS CIDOS

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Abstract. The rapid advancement of technology has transformed teaching and learning across all levels, with Learning Management Systems (LMS) playing a central role. The Curriculum Information Documents Online System (CIDOS) has been used in Polytechnics since 2010 and extended to Community Colleges in 2023. However, usage among lecturers remains suboptimal, and their readiness to adopt this platform requires further examination. This study, therefore, aims to assess the perception and readiness of Polytechnic and Community College (PolyCC) Kedah-Perlis lecturers in using CIDOS and to propose measures to enhance its effectiveness. The study applies the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) as guiding frameworks. Data were collected through an online questionnaire distributed to 249 respondents, analyzed using a mixed-methods approach—quantitative descriptive analysis and qualitative thematic analysis. Findings indicate that lecturers' perceptions of CIDOS are generally positive, with an average score above 3.5, reflecting favourable views of its usability and effectiveness in teaching and learning. Most respondents also expressed confidence and comfort in using CIDOS, suggesting a high level of readiness. However, some aspects scored below 3.0, highlighting gaps in technical skills, training, and infrastructure that require further attention. The study emphasizes the importance of structured and ongoing training to improve digital literacy, stable internet access to support usage, and stronger institutional support to enhance teaching and learning experiences. The outcomes are expected to guide management in refining LMS implementation strategies and strengthening CIDOS as a more effective tool. Future research should expand to include students and PolyCC institutions in other zones to provide a more comprehensive perspective.

Keywords: Lecturer perception, lecturer readiness, LMS CIDOS, Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology

1. INTRODUCTION

The paradigm shift in the global education landscape has seen a significant increase in the use of hybrid learning models. Hybrid learning, which combines elements of face-to-face and online teaching, has become a necessity for higher education institutions to ensure the continuity and effectiveness of the teaching and learning (T&L) process [1]. In Malaysia, Technical and Vocational Education and Training (TVET) institutions, including polytechnics and community colleges, are no exception to this transformation. Hybrid learning is seen as a potential approach to enhance flexibility, efficiency, and accessibility of TVET education, in line with the demands of the Industrial Revolution 4.0 and the increasingly dynamic labour market [2]. Hybrid learning is no longer an option but a strategic necessity to produce graduates who are competent and relevant to the industry. The Department of Polytechnic Education and Community Colleges (JPPKK) has taken proactive steps in the digital transformation of education. On 15 April 2025, JPPKK was recognized as a pioneer in digital transformation through the successful implementation of the National Government Hybrid Cloud pilot project, which involved the CIDOS 4.0 digital learning system. This system has been used as an online T&L medium by nearly 100,000 users from 36 Polytechnics and 106 Community Colleges nationwide, demonstrating JPPKK's commitment to digitalization and hybrid learning [19],[22]. In addition, the Virtual Hybrid Classroom initiative has also been introduced to provide students with more flexible and efficient learning opportunities [8]. The National E-Learning Policy (DePAN) 1.0 (2011) laid the foundation for e-learning, defining 'hybrid learning' as blended learning that combines conventional and online teaching [9]. The policy was implemented in three phases and based on five

main pillars: infrastructure, organizational structure, professional development, curriculum and e-content, and culture [9]. This shows that the policy framework for hybrid learning has existed for a long time, and JPPKK's latest initiatives are a continuation of that policy. The Learning Management System (LMS) plays a critical role in supporting the implementation of hybrid learning. The factors influencing LMS acceptance have been the focus of research. Critical factors affecting effective LMS use in TVET institutions, including both technological and human factors have been identified [10]. Determinants of LMS usage quality, emphasizing the dimensions of information quality, system quality, and service quality have also been reported [11]. These findings are important for understanding how LMS can be optimized to support the hybrid learning needs of polytechnics and community colleges. Malaysian polytechnics have used the LMS Curriculum Information Documents Online System (CIDOS) since 2010, while community colleges began adopting it gradually in 2023. Its main functions include resource sharing—allowing lecturers to upload notes, assignments, and quizzes—interactive tools such as forums and online assessments for hybrid learning, accessibility that enables learning "anytime and anywhere" without physical or time constraints, as well as standardization through institution-specific versions to ensure curriculum uniformity across all institutions.

However, a small number of polytechnic lecturers still do not use the CIDOS LMS, as reflected in usage reports each semester. Reasons for not optimizing CIDOS include low computer literacy, preference for traditional methods, lack of proficiency with available functions, poor user-friendliness, and the nature of some courses requiring hands-on teaching, which reduces interest in conducting hybrid T&L.

Therefore, this study aims to assess the perceptions and readiness levels of lecturers (respondents) from Polytechnics and Community Colleges (PolyCC) in Kedah and Perlis regarding the use of CIDOS LMS—an important step in identifying problems and finding solutions. In addition, the study seeks to identify the challenges respondents face in using CIDOS and propose relevant improvements to enhance the platform's optimal use. With a deeper understanding of these factors, improvement measures can be designed to further strengthen CIDOS usage, thereby improving the quality of education in Malaysian Polytechnics and Community Colleges.

This study is expected to provide valuable insights to management in strengthening LMS implementation strategies and offering concrete recommendations to overcome potential barriers. In doing so, CIDOS can not only serve as an effective learning tool but also foster a more innovative and inclusive learning culture for all stakeholders involved.

1.1 Research Gap

Research Gap Although previous studies have assessed lecturers' readiness and perception of LMS Cidos, most only identify the issues without exploring why they occur or how to address them effectively. There is a lack of research examining the interplay between system quality, organisational support, and pedagogical readiness in driving sustainable LMS adoption. Furthermore, most studies rely heavily on self-reported data and rarely consider the broader organisational and technical context influencing lecturers' behaviours. This study addresses this gap by integrating TAM and UTAUT frameworks to examine not only lecturers' perceptions and readiness but also the systemic and organisational factors influencing LMS Cidos adoption, providing actionable insights for improvement.

1.2 Research Objectives

The study aims to achieve the following objectives:
  i)   To assess the perceptions of Polytechnic and Community College lecturers towards the LMS CIDOS.
  ii) To evaluate the readiness of lecturers in using the LMS CIDOS.
  iii) To identify the challenges faced by lecturers while using the LMS CIDOS.
  iv) To propose recommendations for improving LMS CIDOS implementation and usage.

1.3 Research Questions

Based on the objectives, the study seeks to answer the following research questions:
  i)   What are the perceptions of lecturers regarding the usefulness and ease of use of LSM CIDOS?
  ii) How ready are lecturers to adopt and use LMS CIDOS effectively in their teaching and learning activities?

iii) What challenges do lecturers encounter when using LMS CIDOS?
iv) What measures can be implemented to enhance the effectiveness and adoption of LMS CIDOS?

2. LITERATURE REVIEW

Various hybrid learning models have been proposed and implemented in higher education. The National Education Association (NEA) provides an overview of different hybrid learning models, including their key features, terminology, common pedagogical practices, and examples [12]. Hybrid learning as a potential alternative learning model for the future [13]. The development of online or hybrid learning models for higher education programs, emphasizing cost-effective implementation, is discussed in models. An integrative approach to hybrid learning has also been explored in engineering education, demonstrating its suitability for various fields within TVET [14]. These models provide frameworks for evaluating and designing effective hybrid learning implementation, taking into account lecturers' readiness and their perceptions of technology and pedagogy integration.

The Learning Management System (LMS) has become an essential foundation in transforming higher education, particularly in the context of Polytechnics and Community Colleges in Malaysia. The pace of change accelerated following the advent of the digital era and the COVID-19 pandemic [1], [2]. A study found that students had positive perceptions of online teaching and learning, reflecting the potential of LMS in supporting the educational process [1]. Additionally, the COVID-19 pandemic accelerated the adoption of technology in education, with teachers facing challenges in implementing home-based learning [2]. Therefore, in line with these changes, teaching delivery approaches also need to be given attention so that knowledge is conveyed more effectively for today's generation.

The use of LMS such as CIDOS not only offers flexibility in learning but also opens opportunities for various innovations in teaching methods. With the implementation of this technology, lecturers and students can interact more dynamically through interactive virtual platforms. This includes the use of discussion forums, online quizzes, and project-based activities that can be conducted without geographical limitations.

However, to ensure the effective use of LMS, it is important to focus on continuous training and technical support for users. One of the main challenges is the lack of technological skills among some educators and students. According to Abdullah et al. [7], users' readiness and acceptance of LMS are greatly influenced by past experiences, ICT skills, and institutional support. This is further supported by Ahmad & Johari [8], who stressed that technological advancements, such as the Industrial Revolution 4.0, require users to be more prepared and responsive to digital changes. Similarly, Sabri & Mohamed [2] argued in their study that the main challenges include a lack of technical training, internet connectivity issues, time constraints, and system technical problems.

Findings from global studies also support this; the success of LMS implementation depends on system quality, organizational support, and user satisfaction [20]. Demographic factors, ICT experience, ~~as well as~~ and perceptions of ease of use and LMS effectiveness also influence the level of technology acceptance [21]. Therefore, institutions need to provide comprehensive and structured training programs to improve their digital literacy.

In the polytechnic context, a study found that the level of CIDOS usage among students at Politeknik Ungku Omar was high, but there is still a need to improve skills and knowledge about the platform [3]. Another study showed that knowledge and use of CIDOS among lecturers at Politeknik Merlimau still need to be enhanced [4]. In addition, technological infrastructure also needs to be strengthened, especially in rural areas, to ensure stable and high-speed internet access. In this way, students can fully leverage the potential offered by LMS to enrich their learning experience.

2.1 Theoretical Framework of the Technology Acceptance Model (TAM)

This study was developed with reference to the theoretical framework, namely the TAM (Technology Acceptance Model) (Figure 1), introduced by Fred Davis around 1989 to provide a deeper understanding and guide further research. The TAM model is widely used to explain user acceptance of technology usage. The model suggests that technology acceptance is influenced by two main factors: Perceived Usefulness and Perceived Ease of Use.

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In the context of this study, Perceived Usefulness refers to the extent to which a person believes that using a particular system will improve their job performance. For the LMS CIDOS context, this refers to the extent to which respondents believe that CIDOS helps them in the teaching process, preparation of materials, and student assessment. The second factor, Perceived Ease of Use, refers to the degree to which a person believes that using a particular system is free of effort. In this study's context, it relates to how many respondents feel that CIDOS is easy to learn and use without significant technical difficulties.

Both factors directly influence Attitude Toward Using, and subsequently Behavioral Intention to Use, which ultimately leads to Actual System Use. This model is highly relevant to the present study because it directly measures staff perceptions regarding the ease of use and usefulness of the LMS CIDOS.
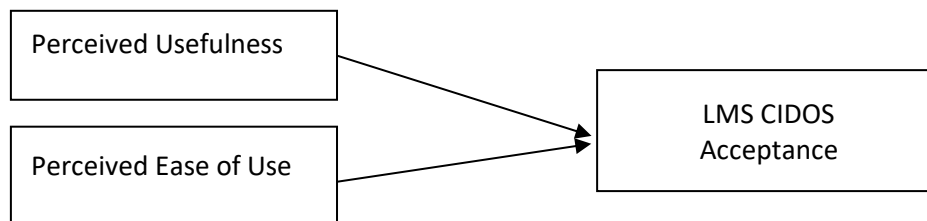
Figure 1. Research Model: Technology Acceptance Model

Finally, continuous research needs to be conducted to assess the effectiveness and impact of LMS usage in higher education. This includes studies on user satisfaction, challenges faced, and recommendations for improvement. Through these measures, the use of LMS such as CIDOS can be maximized to meet the needs of future education.

3. RESEARCH METHODOLOGY

This study utilized a mixed-methods research design, combining quantitative and qualitative approaches to deliver a thorough analysis of lecturers' readiness and perception of the CIDOS Learning Management System (LMS). This combination of methods allows for the triangulation of data, where quantitative data shows broad, generalizable trends and qualitative data adds depth and context to those trends [24].

3.1 Research Design and Quantitative Approach

The quantitative aspect of this research employed a non-experimental survey design accompanied by descriptive analysis. This design was considered suitable for gathering data on lecturers' perceptions, readiness, and behaviors concerning the CIDOS LMS from a substantial sample without altering any variables [25].

3.1.1 Population and Sampling

The study's target population was around 960 lecturers from three Polytechnics and three Community Colleges in the states of Kedah and Perlis, Malaysia. The sampling frame consisted of lecturers from various departments who used the CIDOS LMS for teaching purposes. A cluster random sampling technique is used to ensure both representativeness and practical feasibility. Three selected Polytechnics and three Community Colleges in Kedah and Perlis were regarded as clusters, and the lecturers formed the final sample. The sample size was established using the Krejcie and Morgan (1970) [26] table, which stipulates a minimum sample size of n = 274 for a population of N≈960. The study obtained 249 complete responses, resulting in a response rate of 90.9% of the stated minimum. This results in a margin of error of roughly ±5.6% at a 95% confidence level, deemed sufficient for conducting rigorous statistical analysis and for the outcomes to be applicable to the research population.

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3.1.2 Data Collection Instrument and Procedure

Quantitative data were collected through a structured online questionnaire administered via Google Forms. Items in Sections B and C were measured using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

The instrument was divided into four sections:
  i.　Section A: gathered demographic information (e.g., gender, age, position, institution, work experience).
 ii.　Section B: measured lecturers' perceptions towards the CIDOS LMS, focusing on the constructs of Performance Expectancy (PE) and Effort Expectancy (EE)
iii.　Section C: assessed lecturers' Readiness to Use LMS CIDOS, measuring Behavioural Intention (BI), Use Behaviour (UB), and additional aspects of EE and Facilitating Conditions (FC).

3.1.3 Quantitative Data Analysis

The quantitative data collected were analysed using Statistical Package for the Social Sciences (SPSS), version 26.0. Data cleaning r was conducted requires the elimination of outliers and fixing of missing data. A descriptive analysis specifically mean scores and standard deviations was calculated for each construct to describe the central tendency and dispersion of the responses. The interpretation of mean scores followed a modified framework, as detailed in Table 3.1, to categorize the levels of perception and readiness as Low, Moderate, or High.

Table 3.1: Level of Mean Score Interpretation [19].

Mean Score	Score Interpretation
1.00 – 2.33	Low
2.34 – 3.66	Moderate
3.67 – 5.00	High

3.2 Theoretical Framework: Integration of TAM and UTAUT

This study is underpinned by an integrated theoretical framework combining the Technology Acceptance Model (TAM) [12] and the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. in 2003 [13]. The UTAUT model was selected for its comprehensiveness, as it integrates elements from eight prior models of technology acceptance, including TAM. It provides a robust foundation for explaining Behavioural Intention (BI) and Use Behaviour (UB). The research framework (Figure 3.1) incorporates the following four key UTAUT constructs, which align with TAM concepts:

i.　Performance Expectancy (PE): Defined as the degree to which an individual believes that using the system will help them to attain gains in job performance. This is analogous to **Perceived Usefulness** in TAM.

ii.　Effort Expectancy (EE): Defined as the degree of ease associated with the use of the system. This aligns directly with **Perceived Ease of Use** in TAM.

iii.　Social Influence (SI): Defined as the degree to which an individual perceives that important others believe they should use the new system.

iv.　Facilitating Conditions (FC): Defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system.
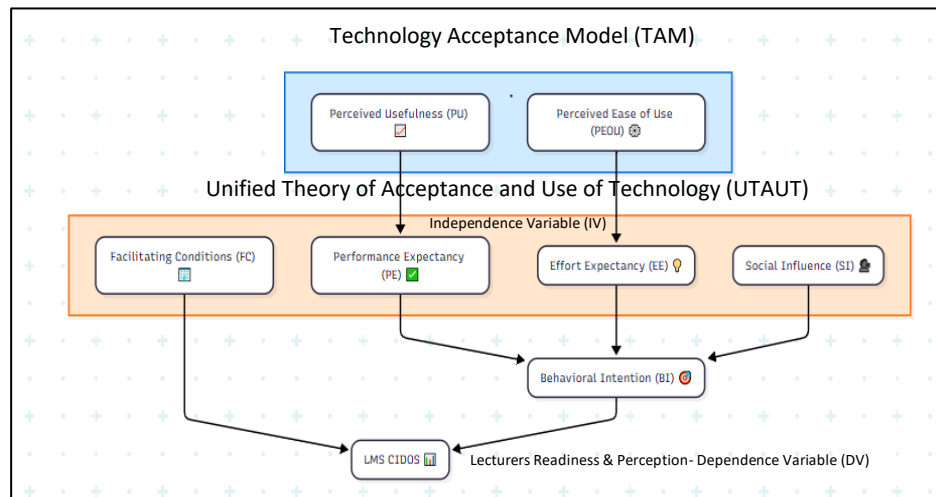
Figure 3.1. Research Framework- Integration of TAM & UTAUT

(Note: A visual diagram showing TAM's Perceived Usefulness and Perceived Ease of Use feeding into UTAUT's Performance Expectancy and Effort Expectancy, which along with Social Influence and Facilitating Conditions, influence Behavioural Intention and ultimately, Use Behaviour.)

3.3 Qualitative Approach

3.3.1 Data Collection

The qualitative component was embedded within the survey instrument. Section D of the questionnaire consisted of open-ended questions designed to gather rich, textual data on:

D1: Technical Training for the CIDOS LMS (relates to FC - availability of training and support)
D2. Internet Connection or Infrastructure (relates to FC- availability of supporting infrastructure)
D3. Time to Learn How to Use the CIDOS LMS (relates to EE- time and effort required to learn)
D4. Technical Issues in the CIDOS LMS System (relates to FC-technical issues that hinder usage)
D5: Other Challenges and Suggestions for Improvement (provides additional insights into FC, EE, or PE)

This approach aimed to identify user experiences, challenges, support needs, and suggestions for improvement, thereby providing explanatory depth to the quantitative findings.

3.3.2 Qualitative Data Analysis: Thematic Analysis

The qualitative data were analysed using thematic analysis following the six-phase guide proposed by Braun and Clarke 14]: familiarizing oneself with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. This process was facilitated using ATLAS.ti 25 software.

The analysis was both data-driven (inductive) and theory-driven (deductive). Initial themes were informed by the UTAUT constructs (FC, EE) and the literature review, while remaining open to new, emergent themes from the respondents' answers. The process involved transcribing the responses, extracting key statements, and systematically organizing and categorizing the data into meaningful themes. As noted by Holloway and Todres [17] in Braun and Clarke [14], thematic analysis is a foundational method for identifying, analyzing, and reporting patterns (themes) within qualitative data, making it ideal for exploring complex phenomena like user experience.

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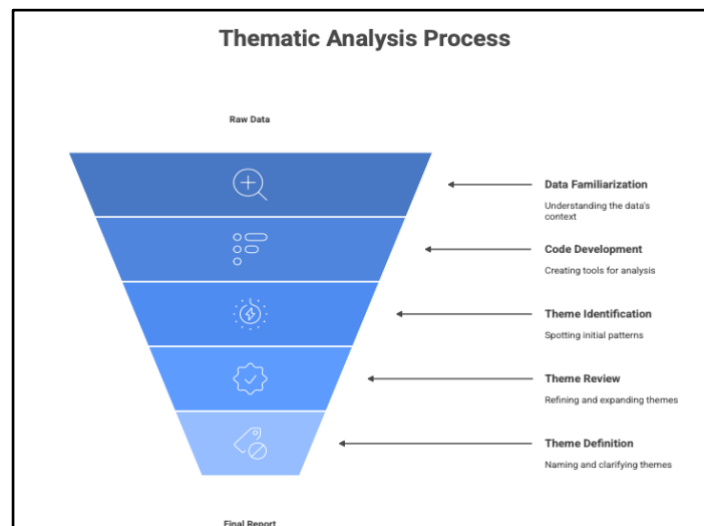
Figure 3.2. Thematic Data Analysis Process (Adapted from Braun & Clarke, 2006) [14].

(Note: A visual diagram illustrating the six phases: 1. Familiarising with data, 2. Generating initial codes, 3. Searching for themes, 4. Reviewing themes, 5. Defining and naming themes, 6. Producing the report.)

3.4 Validity and Reliability

To ensure the rigour of the research instrument, several steps were taken. Content validity was established through an expert review process, where academics with expertise in educational technology and research methodology assessed the questionnaire for clarity, relevance, and comprehensiveness. The internal consistency of the Likert-scale constructs was evaluated using Cronbach's Alpha, with a coefficient of above 0.7 considered acceptable [27]. For the qualitative section, the principles of trustworthiness, including credibility and dependability, were addressed through systematic thematic analysis and the use of direct quotes from participants to support the identified themes.

4. RESULT

This study was conducted with a total of 249 respondents from the Kedah-Perlis Zone. The collected data were categorized into four sections: demographics, lecturers' perceptions, lecturers' readiness, and the challenges they faced. The following are the results obtained after data collection from lecturers at PolyCC in Kedah and Perlis.

4.1 Cronbach's Alpha Value

Based on items B1 to B12, the Cronbach's Alpha value is 0.962. This very high value indicates that the developed questionnaire has excellent reliability. It proves that all 12 items in the Likert scale are interrelated and consistent in measuring perceptions toward the use of the CIDOS LMS. Meanwhile, the Cronbach's Alpha value for items C1 to C14 is 0.845. This shows a good level of internal reliability, meaning that items C1–C14 are consistent and reliable in measuring the same construct, such as barriers, challenges, and other factors related to the CIDOS LMS.

Table 4.1. Cronbach's Alpha Value

Section	Number of Items	Cronbach's Alpha Value	Interpretation
B (Perception of the CIDOS LMS)	12	0.962	Very Good
C (Readiness & Challenges of Usage)	14	0.845	Good

4.2 Respondent Demographics

Table 4.2 presents the demographics of the respondents involved in this study, which includes participants from six institutions in the northern zone. In this study, there were more female respondents compared to males. Based on job positions, there were three categories: 112 Lecturers, 93 Senior Lecturers, and 45 Principal Lecturers. In terms of length of service, most respondents had more than 10 years of experience (230 individuals), while only 19 respondents had less than 10 years of teaching experience. This indicates that the majority of respondents are highly experienced, serving as senior lecturers or holding higher positions such as principal lecturers.

Table 4.2. Respondent Demographics

General Characteristics of Respondents	Specific Characteristics of Respondents	Frequency/ Percentage
Gender	Male	85 (34%)
	Female	164 (66%)
Position	Lecturer	112 (45%)
	Senior Lecturer	92 (37%)
	Principal Lecturer	45 (18%)
Length of Service in the Organization	1 - 5 years	12 (5%)
	6 - 10 years	7 (3%)
	11 - 15 years	43 (17%)
	16 - 20 years	86 (34%)
	21 - 25 years	82 (33%)
	26 years and above	19 (8%)
Higher Education Institution	POLIMAS	131 (53%)
	PTSB	60 (24%)
	PTSS	23 (9%)
	KK ARAU	14 (6%)
	KK BANDAR DARULAMAN	14 (6%)
	KK PADANG TERAP	7 (3%)

4.3 Findings on the Mean Score of Respondents' Perception and Readiness Towards the Use of the CIDOS Platform

Based on the mean score findings regarding respondents' perceptions, the majority of respondents agreed that the CIDOS platform is easy to use, with an average score exceeding 3.75. This was especially evident in items related to the use of CIDOS in facilitating their teaching and learning processes. Respondents also believed that the organization of learning materials became more structured and well-planned. This feedback highlights the Perceived Ease of Use construct from the Technology Acceptance Model (TAM), emphasizing that positive initial user experiences are crucial for technology adoption [12].

The mean score findings on readiness also showed a relatively high score of 3.45. Results further revealed that most respondents successfully obtained Blended Platform status in the previous semester and expressed readiness to participate in additional training on the CIDOS LMS. However, some items recorded scores below 3.0, particularly the lowest score for **C12:** *"I am not ready to use the CIDOS LMS due to lack of skills"*, indicating the existence of a readiness gap that requires attention. There were also moderately risky items with mean scores around **2.93–3.67**, mainly related to technical issues such as Internet access.

Overall, many lecturers demonstrated positive readiness in using the CIDOS platform, particularly in terms of teaching and learning integration as well as content understanding. Nevertheless, issues concerning technical skills, ease of use, and Internet access must be addressed to ensure that continuous training and sustained technical support are provided.

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Table 4.3. Mean Score of Respondents' Perception and Readiness to Use the CIDOS Platform

Section	N	Mean	Std Deviation
Perception	249	3.75	0.78
Readiness	249	3.45	0.62

An independent sample T-test was conducted to determine whether there is a difference in the level of readiness to use the LMS CIDOS based on gender. Prior to that, Levene's test was conducted to ensure whether the variances of the two groups were significantly different or not. The results of Levene's test showed an F value of 3.05 and a p-value of 0.82 (p > 0.05), indicating that the variances in readiness levels were equal between both genders. The results of the T-test analysis for the two independent samples are explained in Table 4.4 as follows.:

Table 4.4. T-Test on Readiness Level Towards LMS CIDOS

	Gender	N	Mean	Nilai T	df	Sig
Readiness Level (C) Towards the CIDOS LMS	Male	84	3.44	-0.15	247	0.98
	Female	165	3.45			

Based on Table 4.4, there is no significant difference in lecturers' readiness levels towards LMS CIDOS based on gender, with a t-value of $t(247) = -0.15$ and a p-value of 0.98 ($p > 0.05$). This indicates that both male and female respondents are equally ready to use LMS CIDOS in teaching and learning.

In addition, an independent sample T-test was also conducted to determine whether there is a difference in lecturers' perceptions of LMS CIDOS based on gender. Levene's test showed an F value of 0.00 and a p-value of 0.92 ($p > 0.05$), indicating that the variances in readiness levels are equal between both genders. The results of the T-test analysis for the two independent samples are presented in Table 4.5 as follows:

Table 4.5. T-Test on the Perception Level Towards Using LMS CIDOS

	Gender	N	Mean	Nilai T	df	Sig
Perception Level (B) Towards the CIDOS LMS	Male	84	3.77	0.31	247	0.75
	Female	165	3.74			

Table 4.5 shows that there is no significant difference in lecturers' readiness levels towards LMS CIDOS based on gender, with a t-value of $t(247) = 0.31$ and a p-value of 0.75 ($p > 0.05$).

4.4 Findings of the Qualitative Data Study

The study data were collected through open-ended questions stated in the questionnaire for all respondents. The questions focused on the challenges encountered by respondents while using the CIDOS LMS in their teaching and learning activities. A thematic analysis of the open-ended responses revealed six prominent themes:

a. Theme 1: Training and Support (n=35)
b. Theme 2: Internet Connectivity and System Performance (n=49)
c. Theme 3: User Interface (n=24)
d. Theme 4: Time Constraint and Workload (n=22)
e. Theme 5: Motivation and Acceptance (n=28)
f. Theme 6: Student-Related Challenges (n=17)

4.4.1 Theme 1: Training and Support

Respondents stated that the existing training is **insufficient** and needs improvement, as reflected in the following statement:

> *"Provide workshops for small groups, for example, 5 people with one tutor."* (ID1:18)

This statement was also supported by other respondents who suggested conducting continuous workshops and preferred more practical training to address issues related to quiz creation, assessment settings, and content integration, as illustrated below:

"Training on the implementation of usage for developing tests or quizzes needs to be expanded." (ID1:15)

In summary, there is a strong need for relevant parties to hold more frequent training sessions, especially regular workshops at the beginning of each semester. This need clearly reflects the Facilitating Conditions construct. The availability and quality of training, tutorials and ongoing support are crucial for improving technology use. Feedback indicates a significant gap in this area which is hindering lecturers from moving basic to more advanced use of the platform. Respondents also want more hand-on training that focuses on challenges with quiz creation, assessment settings and content integration. They requested the creation of tutorials, video or easily accessible online guides for self-learning. Ongoing support and training for lecturers with limited IT skills would also be greatly valued.

4.4.2 Theme 2: Internet Connectivity and System Performance

The analysis showed that participants expressed critical opinions, highlighting this as a major challenge that significantly affects the usability of the CIDOS LMS, as illustrated by the following respondent:

"I postponed tasks or teaching and learning (T&L) activities only after making a complaint." (ID2:14)

The situation became even more difficult when lecturers had to spend a long time just to open the CIDOS website and use their own mobile data to access it, as explained by another respondent:

"I used my own hotspot, but it's not suitable for T&L in class. The institution should provide strong internet access and a high-capacity server." (ID2:21)

In conclusion, this situation affects classroom delivery activities. Having complete and reliable facility support can enhance teaching and learning activities. Findings in [15] also showed that the lack of administrative support in implementing differentiated instruction was a challenge in the Technical and Vocational Education and Training (TVET) system. Administrators must ensure that the facilities provided are in good condition to support teaching implementation. This theme is closely related to the Facilitating Condition construct. A stable, high-speed internet connection and a reliable server system are essential technical prerequisites for any Learning Management System (LMS) [23].

4.4.3 Theme 3: User Interface

Some respondents found the CIDOS interface to be complex and not intuitive. For example, compared to other platforms such as Google Classroom or Microsoft Teams, CIDOS was considered less user-friendly and rather difficult to navigate, as stated by the following respondent:

"The user interface is not user-friendly; if the system is not intuitive or is complex, new users will require more time to understand and use it effectively." (ID4:18)

This theme relates to Effort Expectancy (EE) and its TAM equivalent, Perceived Ease of Use (PEOU). A complicated interface makes the system feel hard to use. In summary, the **complex settings** and the **multiple steps** involved in course preparation, assessment, and content management discouraged respondents from using CIDOS optimally. Their suggestions included **simplifying the interface** by reducing the number of steps for common tasks, improving the navigation menu, and making the platform more **mobile-responsive**.

4.4.4 Theme 4: Time Constraints and Workload

Time constraints were also a challenge for respondents in learning and effectively using CIDOS due to other commitments, including additional responsibilities such as administrative tasks, departmental activities, and others, as stated by the following respondent:

"Teaching more than 24 hours a week, no time to prepare more systematic materials that could enrich physical teaching and learning (T&L)." (ID3:20)

This statement was further supported by other respondents who noted that lecturers are often burdened with additional tasks, as reflected below:

"Overloaded with various tasks such as preparing teaching materials, research, assessment, departmental meetings, and co-curricular activities, which limit the time available to learn CIDOS." (ID3:37)

In summary, time constraints are the main factor hindering lecturers from preparing teaching materials in the CIDOS platform. Respondents suggested allocating **dedicated time slots**, such as conducting workshops during semester breaks, and reducing non-T&L related tasks.

4.4.5 Theme 5: Motivation and Acceptance

Another challenge faced by participants was related to **motivation** in using CIDOS, as highlighted by the following respondent:

"Already used to other LMS platforms like Google Classroom, Padlet, and others. Promotion and training need to be strengthened." (ID3:16)

In addition, the absence of a **mandatory usage policy** also led some staff to only choose a few courses to use the platform, as explained below:

"As long as there is no mandatory directive, the option not to use it remains available." (ID3:32)

In conclusion, implementing **mandatory usage** for every lecturer should be emphasized. Providing **incentives or recognition** for active users is also important to motivate them to optimize the use of CIDOS in teaching and learning activities.

4.4.6 Theme 6: Student-Related Challenges

Respondents also agreed that challenges exist on the student side, particularly regarding their limited access to stable internet or suitable devices to use CIDOS effectively, as noted by the following respondent:

"Students without internet access find it hard to use CIDOS; institutional Wi-Fi is very limited." (ID5:8)

"Students do not give good cooperation." (ID3:40)

In summary, it is essential to provide **technical training for students**, ensure **better internet access** by expanding Wi-Fi coverage across the institution so that students can effectively use CIDOS to complement teaching and learning activities, both inside and outside the classroom.

5. DISCUSSION

An alpha value greater than 0.9 for the questions on perceptions of the CIDOS LMS indicates a very high level of internal reliability. This means that all items in this section are consistently interrelated and form a solid measure of users' perceptions of the CIDOS LMS. Therefore, this instrument is highly suitable for studies related to users' perceptions of digital learning systems. An alpha value greater than 0.8 shows that the items in the section on lecturers' readiness have good internal reliability. These items are consistent in measuring constructs related to technical barriers, usage discomfort, skill levels, and technology access. This section provides a strong representation of the issues that hinder the effective use of the CIDOS LMS.

Both sections of the questionnaire recorded Cronbach's Alpha values, namely 0.962 for Section B and 0.845 for Section C. This proves that the instrument is valid, reliable, and suitable to be used in empirical studies related to the use of the CIDOS LMS among lecturers in TVET institutions.

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This study shows that lecturers have a positive perception (M = 3.75) and a relatively high level of readiness (M = 3.45) towards using CIDOS, consistent with the findings in [16] who highlighted the role of effort expectancy, social influence, and facilitating conditions in LMS usage. While their study found that performance expectancy had little impact on continued intention, this study indicates that lecturers still find CIDOS useful for managing the teaching process. However, its impact on actual teaching performance may be limited without stronger infrastructure support, ongoing training, and institutional motivation.

It is hoped that this study will provide valuable insights to PolyCC administrators and staff in improving the effectiveness of CIDOS usage. The findings are also expected to contribute to the development of higher education in Malaysia.

6. CONCLUSION & RECOMMENDATION

This section outlines the main findings of the study, provides relevant recommendations based on the results obtained, and discusses the limitations that may have influenced the outcomes.

6.1 Conclusion.

This study aimed to examine Polytechnic and Community College lecturers' perception, readiness, and intention to continue using the CIDOS LMS by combining TAM and UTAUT constructs. A survey with both closed and open-ended questions was conducted, and 249 valid responses were collected from six institutions in Kedah and Perlis. Descriptive analysis showed that the constructs were at a moderate-to-high level overall. The qualitative results supported these findings, with respondents frequently mentioning issues such as infrastructure and Internet connectivity, training and support, the time and effort needed to learn, and interface or usability concerns. Overall, the results show that lecturers continued use of LMS CIDOS is influenced more by supportive conditions and ease of use within the organisation, rather than by performance benefits alone.

6.2 Recommendations.

From these findings, several key actions are recommended. First, improve facilitating conditions through better infrastructure (campus-wide Wi-Fi, stable hosting, and dedicated bandwidth) and strong support services (helpdesk, technical escalation, and departmental "CIDOS champions"). Second, reduce effort expectancy by offering step-based training, built-in guidance within LMS CIDOS, and a mobile-friendly design to ease daily tasks. Third, strengthen social influence through peer mentoring, practice communities, and leadership recognition to encourage adoption. Although performance expectancy was not a direct predictor, it can be enhanced by aligning LMS CIDOS with core teaching processes such as assessment, content delivery, and feedback, supported by small design improvements like faster grade entry or analytics dashboards. Finally, establish a continuous improvement cycle by tracking usage data, linking it to training and support, and reviewing progress regularly at institutional level.

6.3 Limitations and future work.

As across-sectional self-report study is limited to Kedah–Perlis institutions and the LMS CIDOS platform, the generalisability of the results is restricted. Future studies should use longitudinal or quasi-experimental designs to test the causal effects of training and infrastructure improvements on continuance intention and actual use, broaden sampling to other regions, and include additional constructs (such as self-efficacy and habit) as well as multi-level influences (e.g., unit or department effects).

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