Unveiling the Catalysts of Sustainable Development Practices Adoption: Empirical Insights from Asian Online Distance Learning Higher Institutions

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Abstract
This study explores the complex interplay between attitude, subjective norms, perceived behavioral control, organizational commitment, intention, and the adoption of sustainable development practices among academicians and non-academicians in online distance learning higher education institutions in Vietnam, Thailand, Malaysia, Philippines, and Indonesia. Through rigorous analysis of primary data collected from 1930 employees, the research utilizes structural equation modeling to uncover the intricate dynamics that shape sustainable behavior in this unique context. The findings of this study have significant implications for both theoretical and practical domains. The research expands our understanding of the factors influencing sustainable behavior in online higher education by examining the relationships among different variables. These insights inform the development of targeted interventions, policies, and initiatives to foster sustainability in online distance learning institutions. By identifying factors that positively influence the adoption of sustainable practices, administrators and policymakers can design strategies to enhance these factors, promoting sustainability among employees and leading to a positive environmental impact. The study's robust findings, with support for eight out of nine hypotheses, enhance the validity and confidence in the identified relationships. This study provides valuable empirical evidence that guides future investigations and serves as a foundation for evidence-based decision-making in the field of sustainable development in online higher education.
Keywords: Attitude, Organizational Commitment, Perceived Behavioral Control, Subjective Norms, Intention, Adoption

Introduction

The incorporation of sustainable development principles in online higher education institutions is a crucial matter in today's dynamic educational environment. With the increasing number of students opting for online learning, it is vital to prioritize the integration of sustainable practices within these institutions (Bell et al., 2017). Embracing sustainable development in online education has the potential to yield various benefits such as reduced carbon emissions, resource conservation, and ensuring equitable access to quality education. Moreover, it instills a sense of environmental responsibility in students, empowering them to drive positive changes within their communities (Wang et al., 2022). In Asian countries, the adoption of sustainable development practices in online higher education institutions is of utmost importance to tackle the unique challenges faced by the region. With rapid economic growth and urbanization, the significance of sustainable development cannot be overstated. Online higher education institutions play a pivotal role in nurturing future leaders and professionals, necessitating the integration of sustainable practices in their curricula and operations (Ribeiro et al., 2017). This study aims to delve into the specific catalysts that drive the adoption of sustainable development in Asian online higher education institutions, considering cultural, social, and economic factors. By shedding light on these insights, the research endeavours to promote the adoption of sustainable development, empower students, and contribute to the long-term well-being of Asian societies (Ali, 2020). The managerial and practical gap in the adoption of sustainable development in online higher education institutions arises from a lack of clear policies and guidelines, limited resources for implementation, and insufficient training and awareness among faculty and staff (Mashroofa et al., 2023). Bridging this gap requires effective leadership, strategic planning, capacity-building initiatives, and the integration of sustainability principles into curriculum design and institutional practices. The core issue pertains to the inadequate implementation of sustainable development practices in online higher education institutions throughout Asia (Leal et al., 2021). This problem arises from the absence of well-defined policies, insufficient resources, and inadequate training, which impede the seamless integration of sustainability principles into both curricula and institutional practices. It is imperative to address these obstacles in order to cultivate a sustainable future (Bag et al., 2021). The significance of this study investigating the adoption of sustainable development practices in online higher education institutions among Asian countries cannot be overstated. With the increasing prominence of online learning, it becomes crucial to ensure that these institutions actively incorporate sustainable practices. By identifying the managerial and practical gaps that hinder the adoption of sustainable development, this study offers valuable insights to policymakers, administrators, and educators. This study delves into the catalysts driving the adoption of sustainable development practices in Asian online distance-learning higher institutions. By offering empirical insights, it aims to decipher the pivotal factors that empower these institutions to embrace sustainability, fostering a positive impact on education, society, and the environment. The findings have the potential to guide the development of strong policies, strategies for resource allocation, and initiatives for capacity building, all aimed at facilitating the integration of sustainability principles into online higher education. This study aims to assess the direct and indirect relationship between attitude, subjective norms, perceived behavioral control, organizational commitment, intention, and adoption of sustainable development practices among employees in online distance learning higher education institutions in Asian countries of Vietnam, Thailand, Malaysia, Indonesia, and the Philippines.

Literature Review

Underpinning Theory

The Theory of Planned Behavior (TPB), introduced by Ajzen in 1991, stands as a widely embraced and empirically validated social psychology theory. It adeptly captures the intricate interplay between attitude, subjective norms, perceived behavioral control, and behavior, rendering it a powerful framework for understanding human conduct (Ayar and Gürbüz, 2021). TPB's versatility has led to its extensive utilization in previous studies, particularly in the exploration of environmental behaviors and the promotion of sustainable development practices (Stern, 2000). By employing TPB as a lens, researchers gain a deeper understanding of the factors that shape individuals' intentions and actions, thus illuminating the underlying psychological mechanisms that drive behavior change. This insightful perspective empowers researchers and practitioners to unravel how attitudes, subjective norms, and perceived behavioral control synergistically influence behaviors associated with environmental sustainability. Armed with this knowledge, they can develop effective strategies and interventions that foster sustainable practices and engender positive societal outcomes. TPB serves as a vital tool in unraveling the complexities of human behavior, enabling the advancement of sustainable development agendas and the creation of a more environmentally conscious society.

Attitude and Adoption behaviour

Attitude toward the adoption of sustainable development practices can be defined as a lasting feeling for taking protective actions for the environment, society, and economic issues. Some researchers have shown that attitude has a significant effect on sustainable development and changing attitude towards sustainability is key to promoting actions in favour of sustainability at individual and corporate levels (Milfont and Sibley, 2012; Kalsoom, 2019). Zhivkova (2022) supposed that if the staff had a positive attitude at work in an environment and friendly way, there would have been a faster implementation of the practice for sustainable development in the organisation. Other studies find that although participants have a positive attitude toward sustainability, their intention to actively adopt sustainable development accordingly does not necessarily correspond to this attitude (Salas-Zapata et al., 2018) or even that positive attitudes do not always transfer into behaviors (Kalsoom, 2019).

Perceived behavioral control, Intention and Adoption behaviour

Perceived behavioral control mentions a person's perception of their capability to be involved in a given behavior (Ajzen, 1991). Perceived control can have a straight effect on behavior, and it can also indirectly impact behavior through its effect on intentions (Ajzen, 1991). In earlier studies, it was clinched that the perceived behavioral control variable is a significant factor in forecasting the intention toward sustainable behavior (Dean et al., 2008). Canova & Manganelli (2020) discovered that perceived behavioral control has the strongest analytical power of intention among three factors to perform energy-saving behaviors of Italian people. Therefore, people with high perceived behavioral control are more likely to have the intention to perform behaviors and to contribute to such behaviors.

Organizational commitment, Intention and Adoption behaviour

The relationship between organizational commitment, intention, and adoption behavior is a crucial area of study within organizational psychology and management. Organizational commitment refers to an individual's psychological attachment and loyalty to an organization,

while intention refers to the individual's plan or willingness to engage in a particular behaviour (Benkarim & Imbeau, 2021). Adoption behavior, on the other hand, involves the actual implementation or acceptance of a new practice or innovation within the organization. Research has shown that a strong sense of organizational commitment is positively related to the intention to engage in adoption behaviour. When employees feel committed to their organization, they are more likely to be motivated to support and embrace organizational changes and new initiatives. This commitment can arise from factors such as job satisfaction, trust in leadership, and perceived organizational support. Intention acts as a bridge between commitment and adoption behaviour (Arshad et al., 2022). It represents the cognitive state where individuals have made a conscious decision to act in a certain way. The intention is influenced by various factors, including individual beliefs, attitudes, and perceived benefits or costs associated with the adoption behaviour (Kara et al., 2023). A high level of commitment can strengthen the intention to adopt new practices or innovations, as individuals are more likely to perceive the behavior as consistent with their commitment and aligned with their organizational values (Soomro et al., 2023). Furthermore, the relationship between intention and adoption behavior suggests that individuals who have a strong intention to adopt a new behavior are more likely to follow through and actually implement the behaviour. This implementation is influenced by factors such as individual capabilities, available resources, and organizational support (Gumasing & Ilo, 2023).

Subject Norm and Intention
Ajzen (1991) described that a person will have the intention to behave when they obtain social pressure from the environment (society, friends, and family), which is called subjective norms in TPB. Ajzen (1991) additionally enlightened that a person may have a vital person or group that replicates behavior performed by their orientations. Subjective norms clarified that persons are in the progression of learning and observing others to obtain judgments before displaying behavior. It has been concluded by numerous researchers that subjective norms for sustainable consumption behavior have a significant effect on sustainable consumption intention (Ayar and Gürbüz, 2021). Chan (1998) claimed that subjective norms are mainly significant for environmental behavior. Canova & Manganelli (2020) find that the intentions of Italians to perform energy-saving behaviors were significantly impacted by subjective norms.

Intention and Adoption behaviour
According to the TPB (Ajzen, 1991), the performing decision of behavior is directly determined by a person's intention to participate in it. In a number of researches about sustainable behavior, Cho (2019) stated that intention positively and significantly influences actual behavior. That means individuals with high intentions have a highly possible ability to convert intention into actual behavior. Numerous studies have extensively investigated the relationship between intention and adoption in sustainability development practices, shedding light on crucial insights that shape our understanding of this dynamic interplay (Kebah, et al., 2019). It is consistently demonstrated that intention plays a pivotal role in initiating sustainable practices (Aliabadi et al., 2020). Findings indicate that individuals and organizations with strong intentions to adopt sustainable behaviors are more inclined to take proactive steps toward sustainability initiatives. These intentions are influenced by various factors, including personal values, environmental attitudes, and perceived subjective norms (Cakirli & Theuvsen, 2020). However, having good intentions alone does not guarantee

successful adoption. Studies have identified several barriers that hinder the translation of intentions into concrete actions (Kebah et al., 2019). Financial constraints pose a significant impediment, as sustainable practices may require upfront investments or higher operational costs (Nguyen & Drakou, 2021). A lack of knowledge and awareness about sustainable alternatives can also hinder adoption, as stakeholders may be uncertain about effective implementation. Moreover, organizational culture and resistance to change are critical factors affecting adoption. Stakeholders may be hesitant to embrace sustainability practices if they clash with established norms or routines, despite their positive intentions (Lin et al., 2020). To bridge the intention-adoption gap, researchers emphasize the importance of targeted interventions. Communication and education campaigns that raise awareness about sustainability benefits and offer practical implementation guidance can positively influence adoption rates. Additionally, policy support, including incentives, subsidies, and regulations, plays a crucial role in encouraging stakeholders to adopt sustainable practices (Al Mamum et al., 2023).

Based on the above conceptual development, the following hypotheses were proposed for this study

H1:   There is a relationship between attitude and the adoption of sustainable development practices among employees in Asian online distance learning higher institutions.

H2:   There is a relationship between perceived behavioral control and the adoption of sustainable development practices among employees in Asian online distance learning higher institutions.

H3:   There is a relationship between organizational commitment and the adoption of sustainable development practices among employees in Asian online distance learning higher institutions.

H4:   There is a relationship between intention and the adoption of sustainable development practices among employees in Asian online distance learning higher institutions.

H5:   There is a relationship between organizational commitment and intention to adopt sustainable development practices among employees in Asian online distance learning higher institutions.

H6:   There is a relationship between perceived behavioral control and intention to adopt sustainable development practices among employees in Asian online distance learning higher institutions.

H7:   There is a relationship between subjective norms and intention to adopt sustainable development practices among employees in Asian online distance learning higher institutions.

H8:   There is a mediating effect of intention on the relationship between organizational commitment and adoption of sustainable development practices among employees in Asian online distance learning higher institutions.

H9:   There is a mediating effect of intention on the relationship between perceived behavioral control and adoption of sustainable development practices among employees in Asian online distance learning higher institutions.
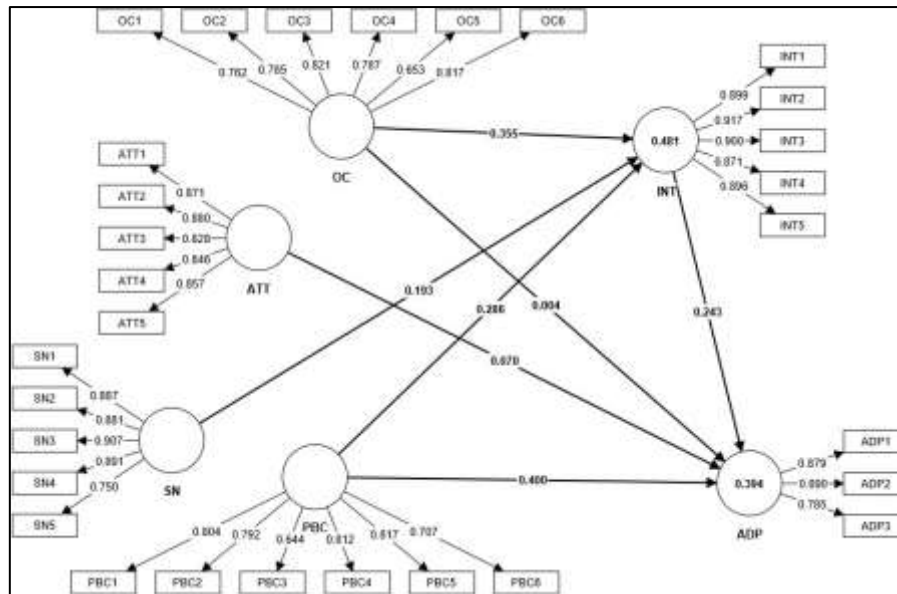
Figure 1: Research Model
Note: OC=Organizational Commitment   ATT=Attitude   SN=Subjective Norms
PBC=Perceived behavioural Control   INT=Intention   ADP=Adoption

Methodology

This study focused on employees working in Asian (Vietnam, Thailand, Malaysia, Indonesia & Philippines) online distance-learning higher education institutions including academicians and non-academicians. Primary data was collected using survey equipment, and the survey questionnaire utilized in the study was carefully developed based on previous research, ensuring reliability and validity. A non-probability snowball sampling technique was employed, with participants receiving the survey questionnaire via email. The survey consisted of 30 observed variables, including exogenous and endogenous measurements. The endogenous variables encompassed constructs such as attitude with 5 measurement items (Voon et al., 2017), subjective norms with 5 measurement items (Rivis & Sheeran, 2003), perceived behavioral control with 6 measurement items (Li et al., 2020), and organizational commitment with 6 measurement items (Angle & Parry, 1981) adapted from mentioned studies. The mediating variable was the intention with 5 measurement items (Fu et al., 2016), while the dependent variable was adoption with 3 measurement items (De Cannière et al., 2016). Participants rated each measurement item on a five-point Likert scale, ranging from "strongly disagree" to "strongly agree." Out of the 2626 questionnaires distributed, 2025 were collected, resulting in a response rate of 77.11%. After screening the data and removing outliers, 1930 samples were found to be clean, and proceeded with data analysis. For data analysis and hypothesis testing, the researchers utilized Smartpls4 software, which employs structural equation modeling (SEM) techniques. The selection of this software was based on its evaluation capabilities and its suitability for conducting multivariate data analysis. Additionally, the model measurement and structural model evaluation procedures followed the guidelines proposed by Ringle et al (2022), with Smartpls4 facilitating these assessments. By using Smartpls4, the researchers were able to conduct comprehensive multivariate data analysis and effectively test the proposed hypotheses. The software's capabilities enabled a thorough evaluation of the measurement and structural models, aligning with the study's objectives.

Data Analysis

Respondents' Profile
The table provides a breakdown of the respondents' frequency and percentage in various categories. In terms of gender, there were 1,196 males (61.93%) and 734 females (38.07%) out of a total of 1,930 respondents. Regarding age, the distribution was as follows: 256 (13.27%) were under 30 years old, 567 (29.36%) were between 31 and 40 years old, 503 (26.07%) were between 41 and 50 years old, 470 (24.34%) were between 51 and 60 years old, and 134 (6.94%) were over 60 years old. The respondents' job categories were predominantly academic, with 1,748 (90.57%) falling under this category, while 182 (9.43%) were classified as non-academic. In terms of years of service, 193 (10%) had less than 5 years, 483 (25%) had 6-10 years, 386 (20%) had 11-15 years, 482 (25%) had 16-20 years, 290 (15%) had 21-25 years, and 96 (5%) had 26-30 years. When asked if they would recommend the service, 1,872 (97%) respondents answered "Yes" and 58 (3%) answered "No." Finally, the respondents represented different countries, with 338 (17.50%) from Vietnam, 203 (10.52%) from Thailand, 392 (20.31%) from Malaysia, 902 (46.75%) from Indonesia, and 95 (4.92%) from the Philippines.

Common Method Bias
In management research, a common challenge arises from the presence of common method bias, where the measurement method used is mistaken for the underlying structure, leading to distorted study findings. To mitigate this issue, the researchers in this study employed Harman's one-factor test method to assess the measurement points. The results of this test indicated that the main factor accounted for only 36.4% of the variance, suggesting that general method bias did not significantly affect the study. This finding aligns with the suggestion by Podsakoff and Organ (1986) that bias is not a concern if the principal components explain less than 50% of the variance. By adopting this approach, the study aimed to enhance the robustness and validity of its results by minimizing the potential impact of common method bias.

Measurement Model
The PLS-SEM algorithm was used in this study to ensure the reliability and validity of the measurement model. Following the advice of Hair, Hult, Ringle, and Sarstedt (2017), two important factors are evaluated: the reliability and validity of the external quality model. The results in Table 1 show that each construct has a minimum of 0.586 and a maximum of 0.804, exceeding the minimum convergence validity threshold of 0.5. In addition, Table 1 shows that the joint reliability for each model ranged from 0.888 to 0.932, exceeding the value recommended by Hair et al (2017) 0.7. Cronbach's alpha value ranges from 0.813 to 0.909. Discrimination validity was assessed by analyzing cross-loadings, which showed that all items had higher loadings than cross-items (Table 1). As Henseler et al (2015) suggested, the difference between hetrotrait-monotraitl (HTMT) ratios was further analyzed to confirm the discrimination of all seven comparisons less than 0.9. (Table 2). Thus, this study provided the validity and reliability of all components recommended by (Hair et al., 2014).

Table 1
Construct Reliability, Validity & Cross Loadings

Constructs	Items	Loadings	CA	CR	AVE
Adoption	ADP1	0.879	0.813	0.888	0.727
	ADP2	0.890			
	ADP3	0.785			
Attitude	ATT1	0.871	0.909	0.932	0.734
	ATT2	0.880			
	ATT3	0.828			
	ATT4	0.846			
	ATT5	0.857			
Intention	INT1	0.899	0.898	0.902	0.804
	INT2	0.917			
	INT3	0.900			
	INT4	0.871			
	INT5	0.896			
Organizational Commitment	OC1	0.762	0.863	0.898	0.597
	OC2	0.785			
	OC3	0.821			
	OC4	0.787			
	OC5	0.653			
	OC6	0.817			
Perceived Behavioral Control	PBC1	0.804	0.858	0.894	0.586
	PBC2	0.792			
	PBC3	0.644			
	PBC4	0.812			
	PBC5	0.817			
	PBC6	0.707			
Subjective Norms	SN1	0.887	0.882	0.911	0.749
	SN2	0.881			
	SN3	0.907			
	SN4	0.891			
	SN5	0.750			

Note: CA-Cronbach Alpha   CR=Composite Reliability   AVE=Average Variance Extracted

Table 2
Hetrotrait-Monotrait (HTMT) Ratio

	ADP	ATT	INT	OC	PBC
ATT	0.502				
INT	0.592	0.654			
OC	0.499	0.681	0.668		
PBC	0.688	0.613	0.653	0.662	
SN	0.469	0.491	0.538	0.489	0.604

Structural Model
To evaluate the structural model, the researchers simultaneously assessed the pathway coefficient (β) and the coefficient of determination (R^2), following the approach outlined by

(Hair et al., 2017). The evaluation in this study employed the PLS (Partial Least Squares) method and utilized 5,000 subsamples to verify the significance of the path coefficients. Table 3 presents the path coefficients (beta), t-statistics, p-values, and the statistical results of hypothesis tests for confidence intervals, providing a comprehensive overview of the analysis results. For H1, the statistical results showed that the relationship between ATT (Attitude) and ADP (Adoption) shows a beta coefficient of 0.070. The T statistic is 2.070, indicating that the relationship is statistically significant at the 0.05 level. The p-value is 0.039, supporting the significance of the relationship. The effect size (f^2) is 0.004, suggesting a small effect. For H2, the statistical analysis revealed that the relationship between PBC (Perceived Behavioral Control) and ADP exhibits a strong positive association. The beta coefficient is 0.400, and the T statistic is 14.248, both highly significant with $p < 0.001$. The effect size (f^2) is 0.146, indicating a moderate effect. For H3, it demonstrated that the relationship between OC (Organizational Commitment) and ADP is found to be non-significant. The beta coefficient is 0.004, with a T statistic of 0.117 and a high p-value of 0.907. This suggests that there is no meaningful relationship between these variables. For H4, the data analysis results showed that the relationship between INT (Intention) and ADP is significant, with a beta coefficient of 0.243 and a T statistic of 7.470. The p-value is 0.000, indicating a highly significant relationship. The effect size (f^2) is 0.048, suggesting a small to moderate effect. Statistical results for H5 revealed that the relationship between OC and INT shows a strong positive association. The beta coefficient is 0.355, and the T statistic is 15.236, both highly significant ($p < 0.001$). The effect size (f^2) is 0.157, indicating a moderate effect. For H6, the statistical analysis results showed that the relationship between PBC and INT is also found to be significant. The beta coefficient is 0.286, with a T statistic of 10.068 and a p-value of 0.000. The effect size (f^2) is 0.090, suggesting a moderate effect. For H7, the findings of data analysis revealed that the relationship between SN (Subjective Norms) and INT demonstrates a significant positive association. The beta coefficient is 0.193, with a T statistic of 7.055 and a p-value of 0.000. The effect size (f^2) is 0.049, indicating a small to moderate effect. For H8, the statistical analysis results demonstrated that the indirect relationship between OC, INT, and ADP is significant. The beta coefficient is 0.086, with a T statistic of 6.641 and a p-value of 0.000. This suggests that the influence of OC on ADP is mediated by INT. Lastly, for H9, the statistical analysis results confirmed that the indirect relationship between PBC, INT, and ADP is also significant. The beta coefficient is 0.070, with a T statistic of 6.424 and a p-value of 0.000. This indicates that PBC's influence on ADP is mediated by INT. The intrinsic value inflation rate (VIF) for all variables in the analysis remained below the more lenient threshold of 5, with the highest value recorded at 2.007 (Table 3). This level of collinearity indicates that size comparisons and interpretation of the structural model coefficients can be made with confidence (Menard, 2001). The adoption construct of the model displayed a notable degree of explained variance for the endogenous construct, with an R^2 of 0.394 (Figure 1). Regarding the mediator, intention, the model successfully accounted for 48.1% of the variance in its structure ($R^2=0.481$). Furthermore, the model's ability to make inferences and offer management suggestions was evaluated by employing the PLSpredict method as recommended by Shmueli et al., (2016, 2019). Q2 predictions higher than 0 indicated that the predictions derived from PLS-SEM outperformed standard naive mean predictions (Table 4). Additionally, in 6 out of 8 instances, the root mean square error (RMSE) values of the PLS-SEM predictions were lower than those of the linear model (LM) prediction benchmark. These outcomes demonstrated the predictive power of the proposed model, reinforcing its efficacy (Table 4). Hair et al (2022) recommended including the Cross-Validated Predictive Ability Test

(CVPAT) as a means to evaluate the predictive capabilities of PLS-SEM models. To assess the model's predictive performance, Lingard et al (2021) conducted a CVPAT in conjunction with the PLSpredicts analysis. The CVPAT employed an out-of-sample prediction approach to measure the model's prediction error and determine the average loss value. Two benchmarks were utilized for comparison: the average loss value of predictions using indicator averages (IA) as a simple benchmark, and the average loss value of a linear model (LM) forecast as a more conservative benchmark. To establish the model's superior predictive capabilities relative to the benchmarks, the average loss value of PLS-SEM should be lower, resulting in a negative difference in the average loss values. The objective of the CVPAT was to determine if the difference in average loss values between PLS-SEM and the benchmarks was significantly below zero. A significantly negative difference would indicate the model's enhanced predictive abilities. The results of the CVPAT, as presented in Table 5, confirm that the average loss value of PLS-SEM was indeed lower than that of the benchmarks. This is evident from the negative difference in the average loss values, providing substantial evidence of the model's superior predictive capabilities. Ringle & Sarstedt (2016) and Hair et al (2018) recommended the use of Importance Performance Analysis (IPMA) to evaluate the significance and effectiveness of latent variables in explaining acceptance. The results of this analysis are presented in Table 6. In terms of their overall impact on adoption, perceived behavioral control (0.470) exerted the strongest influence, followed by intention (0.243), organizational commitment (0.090), attitude (0.070), and subjective norms (0.047). These values indicate the relative importance of each latent variable within the adoption context. In terms of performance scores, attitude achieved the highest score (77.155), while subjective norms attained the lowest score (71.421) on a scale ranging from 0 to 100. This suggests that attitude performed relatively well, while subjective norms had the lowest level of achievement. Despite being a less crucial factor for adoption, attitude demonstrated the highest performance level. Based on these findings, it is recommended that top management in ODL higher education institutions prioritize and emphasize activities aimed at improving employees' attitudes. By focusing on enhancing attitude, it is possible to enhance the overall total effect on adoption.

Table 3
Hypotheses Testing Results, f^2 & Inner VIF

	Beta	T statistics	P values	f^2	2.50%	97.50%	Inner VIF
H1: ATT -> ADP	0.070	2.070	0.039	0.004	0.005	0.137	1.912
H2: PBC -> ADP	0.400	14.248	0.000	0.146	0.344	0.454	1.814
H3: OC -> ADP	0.004	0.117	0.907	0.006	-0.056	0.062	1.961
H4: INT -> ADP	0.243	7.470	0.000	0.048	0.178	0.305	2.007
H5: OC -> INT	0.355	15.236	0.000	0.157	0.308	0.400	1.546
H6: PBC -> INT	0.286	10.068	0.000	0.090	0.231	0.343	1.756
H7: SN -> INT	0.193	7.055	0.000	0.049	0.141	0.248	1.454
H8: OC -> INT -> ADP	0.086	6.641	0.000		0.062	0.113	
H9: PBC -> INT -> ADP	0.070	6.424	0.000		0.050	0.093	

Table 4
PLSpredicts

	Q²predict	PLS RMSE	LM RMSE	PLS - LM
ADP1	0.327	0.587	0.590	-0.003
ADP2	0.285	0.622	0.627	-0.005
ADP3	0.169	0.734	0.736	-0.002
INT1	0.388	0.489	0.491	-0.002
INT2	0.390	0.507	0.511	-0.004
INT3	0.365	0.558	0.543	0.015
INT4	0.382	0.548	0.551	-0.003
INT5	0.396	0.527	0.514	0.013

Table 5
Cross-Validated Predictive Ability Test (CVPAT)

	Average loss difference	t value	p-value
ADP	-0.149	11.974	0.000
INT	-0.180	13.237	0.000
Overall	-0.168	14.407	0.000

Table 6
Importance-Performance Map Analysis

Constructs	Total Effect	Performance
ATT	0.070	77.155
INT	0.243	76.749
OC	0.090	76.825
PBC	0.470	72.727
SN	0.047	71.421

Discussion & Conclusion

The findings of this study have significant implications for Asian online distance learning (ODL) institutions seeking to promote the adoption of sustainable practices among their employees. By focusing on attitude, organizational commitment, subjective norms, perceived behavioral control, and intention, these institutions can develop targeted strategies to foster a culture of sustainability and encourage employee engagement in sustainable behaviors. The attitude was found to be a key driver of sustainable practices adoption. Therefore, ODL institutions should prioritize efforts to shape a positive attitude toward sustainability. This can be achieved through awareness-raising initiatives that highlight the environmental, social, and economic benefits of sustainable practices. By incorporating sustainability education and training programs, institutions can enhance employees' knowledge and understanding of sustainability issues, helping them develop positive attitudes. Organizational commitment emerged as a significant factor influencing sustainable practices adoption. Asian ODL institutions should clearly define sustainability goals and objectives and effectively communicate them to employees. This helps create a shared sense of purpose and commitment to sustainability. Recognizing and rewarding individuals and teams that contribute to sustainable initiatives not only reinforces commitment but also promotes a culture of sustainability within the institution. Subjective norms play a crucial role in shaping individuals' behaviors. To promote sustainable practices, ODL institutions should create an

environment where sustainability is seen as the norm. Open discussions and dialogues about sustainability topics can foster a collective understanding and acceptance of sustainable behaviors. Encouraging knowledge sharing among employees through platforms such as seminars or workshops can further strengthen subjective norms. Leadership engagement and support are also vital in setting the tone for sustainability and influencing employees' perceptions of what is socially desirable and expected. Perceived behavioral control was found to be a significant predictor of sustainable practices adoption. ODL institutions should empower their employees by providing the necessary resources, tools, and support. Offering training and skill development programs focused on sustainable practices equips employees with the knowledge and abilities to engage in sustainable behaviors effectively. Providing access to sustainable technologies, infrastructure, and resources further enhances employees' perceived control over their actions. Involving employees in decision-making processes related to sustainability, such as through participatory approaches and feedback mechanisms, gives them a sense of ownership and control over sustainable practices. Finally, intention was identified as a critical factor in driving sustainable practices adoption. ODL institutions should focus on strengthening employees' intentions by effectively communicating the benefits and positive outcomes associated with sustainability. Highlighting the alignment between sustainable practices and personal values, as well as institutional goals, helps employees develop a strong intention to adopt sustainable behaviors. Encouraging employee involvement and participation in sustainability initiatives, such as through volunteering opportunities or sustainability-related projects, reinforces their intention and fosters a sense of responsibility towards sustainable practices. It is important to note that the strategies presented in this study are not mutually exclusive but rather complementary. ODL institutions should consider implementing a combination of these strategies to maximize their impact on sustainable practices adoption. By adopting a holistic approach that addresses attitude, organizational commitment, subjective norms, perceived behavioral control, and intention, institutions can create an environment conducive to sustainable behaviors.

Theoretical Implications
This study has important theoretical implications for the field of sustainable development and organizational behavior in Asian online distance learning institutions. Exploring the determinants of sustainable practice adoption among employees, it contributes to understanding how attitudes, organizational commitment, subjective norms, behavioral control, and intention influence sustainable behavior. The findings highlight the significance of attitude as a driver of sustainable practices and emphasize the need for interventions to shape employees' sustainability attitudes. This aligns with the Theory of Planned Behavior. The study also emphasizes the role of organizational commitment, showing that a supportive organizational culture enhances employees' commitment to sustainability, in line with social exchange theory. Additionally, subjective norms play a crucial role, as employees are influenced by perceptions of what is considered appropriate in sustainability, as proposed by social norms theory. Perceived behavioral control emerges as another important determinant, with resources, skills, and support empowering employees to engage in sustainable behavior, consistent with self-efficacy theory. These findings contribute to a comprehensive understanding of the factors influencing sustainable behavior among employees in online distance-learning institutions. They inform the development of strategies and interventions that shape attitudes, foster organizational commitment, create supportive

social norms, and enhance perceived behavioral control to promote sustainable practices. Implementing these insights can lead to positive changes in sustainable behavior within Asian online distance learning institutions and beyond. This study makes a notable theoretical contribution by examining the intricate web of relationships among attitude, subjective norms perceived behavioral control, organizational commitment, intention, and the adoption of sustainable development practices among employees in Asian online distance learning higher education institutions. The research unveils nuanced insights into the factors that drive or hinder sustainable practices adoption, enriching our understanding of organizational behavior and sustainability in the educational sector.

Practical Implications
The practical implications of this study for Asian online distance learning institutions seeking to promote the adoption of sustainable practices among employees are significant. Institutions should focus on shaping employees' attitudes towards sustainability through awareness campaigns and educational programs highlighting sustainable practices' benefits. Creating a supportive organizational culture that values sustainability is crucial, achieved by establishing sustainability goals, recognizing and rewarding contributions to sustainable initiatives, and involving employees in decision-making processes. Promoting subjective norms that support sustainable behavior can be achieved through open discussions and leadership engagement. Empowering employees by providing necessary resources, tools, and support, including training programs and access to sustainable technologies, enhances their perceived behavioral control. Implementing these practical implications fosters a culture of sustainability, driving the adoption of sustainable practices and aligning with global sustainability goals.

Suggestions for Future Studies
Future research in the field of sustainable practices in Asian online distance learning institutions can focus on several areas. Firstly, exploring the role of individual characteristics, such as personal values and environmental awareness, in influencing sustainable behavior would provide a more comprehensive understanding of the determinants of adoption. Investigating the effectiveness of interventions and programs aimed at promoting sustainable behavior within these institutions, and assessing their long-term impact, would offer valuable insights into institutional practices and policies. Additionally, expanding the research scope to include a wider range of online learning institutions across diverse regions and cultures would contribute to a more holistic understanding of sustainable practices adoption. Comparative studies could reveal contextual factors that influence the relationship between determinants and sustainable behavior. Lastly, incorporating qualitative research methods, such as interviews or focus groups, would provide deeper insights into the motivations, barriers, and facilitators of sustainable behavior among employees. By addressing these areas, future research can contribute to the advancement of knowledge and inform strategies to promote sustainable practices in Asian online distance learning institutions.

Conclusion
In conclusion, this study provides Asian online distance learning institutions with evidence-based strategies to enhance the adoption of sustainable practices among their employees. By prioritizing attitude, organizational commitment, subjective norms, perceived behavioral control, and intention, institutions can foster a culture of sustainability and contribute to

broader sustainability goals. The successful implementation of these strategies will not only benefit the institution but also have positive impacts on society and the environment.

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