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Does the Adoption of Sustainable Development Practices among Online Distance Learning Higher Education Institutions in Malaysia Matter? The Role of Intention as a Mediator

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Abstract

Sustainable development practices have become a critical issue in organizations worldwide, garnering significant attention. The study of sustainable development practices in online distance learning institutions in Malaysia is significant due to the global importance of sustainability. Understanding the factors influencing the adoption of sustainable practices and the mediating role of intention can offer valuable insights to policymakers, educators, and institutions. The findings can guide the development of strategies promoting sustainable practices in online education, contributing to environmental conservation and the advancement of sustainable development goals in the education sector, both within Malaysia and beyond. This study aims to assess the direct relationships between attitude, perceived behavioral control, subjective norms, and intention, as well as the direct relationship between intention and adoption, and also the mediating effect of intention on the relationship between perceived behavioral control and adoption of sustainable development practices among employees in distance learning higher education institutions in Malaysia. Currently, the level of adoption of sustainable practices in online distance learning higher education institutions in Malaysia is relatively low, highlighting the need for improvement. The study

utilized primary data collected through a survey questionnaire adapted from previous research studies. The data analysis involved 392 clean data points and employed structural equation modeling. The measurement model was assessed to establish convergent validity by examining construct reliability and validity. Discriminant validity was verified through cross-loading and Hetrotrait-Monotrait (HTMT) ratios. The structural model was then evaluated, and the results confirmed significant positive direct relationships between attitude, perceived behavioral control, subjective norms, and intention. Additionally, intention was found to have a positive and significant relationship with adoption. Furthermore, the study revealed that intention significantly mediates the relationship between perceived behavioral control and adoption. These findings provide insights and suggest strategies to enhance the adoption of sustainable development practices in the context of online distance learning higher education institutions. For future studies, researchers should consider exploring the potential moderating effects of individual characteristics, such as prior knowledge, self-efficacy, and environmental awareness, on the relationship between attitude, subjective norms, perceived behavioral control, intention, and adoption.

Keywords: Attitude, Perceived Behavioural Control, Subjective Norms, Intention, Adoption

Introduction

The adoption of sustainable development practices in online distance learning higher education institutions worldwide is a significant cause for concern (Anthony Jnr, 2021). Although online learning offers greater accessibility and reduced carbon emissions, there are challenges to overcome in implementing sustainable practices. The use of digital technologies and infrastructure contributes to increased energy consumption and the generation of electronic waste (Anthony Jnr, 2021). Moreover, ensuring equal access and inclusive learning experiences can be compromised in online settings (Ribeiro et al., 2021). Achieving a balance between environmental impact, educational quality, and accessibility requires innovative approaches such as the promotion of energy-efficient technologies, the recycling of electronic waste, and the cultivation of digital literacy (Anthony Jnr, 2021). Collaboration among institutions, policymakers, and students plays a critical role in addressing these challenges and establishing sustainable online learning environments aligned with global sustainable development goals (Osman et al., 2022). The adoption of sustainable development practices in online distance learning higher education institutions presents a pressing concern within the Malaysian context (Kanapathy et al., 2021). Despite the advantages of flexibility and accessibility offered by online learning, there are specific obstacles to promoting sustainability (Kanapathy et al., 2021). Malaysia's heavy reliance on fossil fuels for electricity generation contributes to a substantial carbon footprint, further compounded by increased energy consumption and electronic waste associated with online learning (Kanapathy et al., 2021). Additionally, ensuring inclusivity and bridging the digital divide in Malaysia's diverse society becomes imperative (Moganadas et al., 2022). Effectively addressing these challenges necessitates a comprehensive approach that involves promoting renewable energy sources, implementing green technology infrastructure, and formulating policies that prioritize sustainability (Osman et al., 2022). Collaborative efforts among educational institutions, government bodies, and industry stakeholders are essential for fostering sustainable online learning practices in Malaysia (Leal et al., 2022). In Malaysia, the issue of adopting sustainable development practices in online distance learning higher education institutions centers around the identification of effective strategies to address environmental impacts and

promote inclusivity (Kanapathy et al., 2021). The key challenge lies in developing and implementing sustainable practices that effectively reduce carbon emissions, energy consumption, and electronic waste within the online learning context. Additionally, it is crucial to tackle the digital divide and ensure equitable access to online education for all (Moganadas et al., 2022). Extensive research is necessary to explore innovative solutions, policies, and collaborative approaches that can foster sustainability in online distance learning institutions in Malaysia while considering these factors (Kanapathy et al., 2021; Moganadas et al., 2022). The research on the adoption of sustainable development practices in online distance learning higher education institutions in Malaysia carries immense significance. It offers valuable insights for reducing the environmental impact of online learning and promoting inclusive and equitable access to education. By identifying effective strategies, policies, and collaborative approaches, the study can contribute to the development of sustainable online education models aligned with Malaysia's objectives of environmental conservation and social equity. The study's findings have the potential to inform decision-making processes, shape institutional practices, and inspire stakeholders to prioritize sustainability in online distance learning. Ultimately, this research can lead to the cultivation of an environmentally conscious and inclusive higher education system in Malaysia. The aim of this study is to assess the relationships among attitude, subjective norms, perceived behavioral control, intention, and adoption of sustainable development practices in online distance learning higher education institutions in Malaysia.

Literature Review

Underpinning Theory

The Theory of Planned Behavior (TPB) can serve as an underpinning theory for examining the adoption of sustainable development practices among online distance learning higher education institutions in Malaysia, with the intention of playing a mediating role. TPB posits that behavioral intentions are strong predictors of actual behavior. The theory suggests that intentions are influenced by three main factors: attitudes, subjective norms, and perceived behavioral control. Attitudes reflect individuals' positive or negative evaluations of the behavior in question. Subjective norms refer to social influences and the perceived expectations of significant others regarding the behavior. Perceived behavioral control reflects the individual's perception of the ease or difficulty of performing the behavior. These factors collectively shape an individual's intention to engage in the behavior, which then mediates the actual behavior.

Attitude & Intention

Attitudes are personal evaluations, thoughts, or beliefs about things, people, or situations. It includes knowledge, thought, and behavior. According to Fishbein and Ajzen (1975), attitudes affect behavior and can be formed through personal experience, social influences, and cultural influences. Attitudes play an important role in decision-making, relationships, and overall health (Eagly & Chaiken, 1993). They are considered an important concept in psychology, they provide insight into human behavior and predict future behavior. Jaishwar et al (2021) explored the relationship between attitudes and intentions in consumer acceptance of electric vehicles (EVs) in sustainable transport in India. This study investigates the factors that influence consumers' EV adoption intentions and explores the role of consumer attitudes toward EVs in shaping EV adoption intentions (Mohamad et al., 2023). This study found that attitudes have a significant positive impact on EV adoption intentions.

Asadi et al (2021) investigated the relationship between attitudes and intentions regarding consumer intention to introduce electric vehicles (EVs) in Malaysia. The study identifies and analyzes the factors that influence consumer preference for electric vehicles. This study showed a positive and significant association between attitudes and intentions (Noral Hidayah et al., 2022). In particular, we explore the role that attitudes play in shaping consumer intentions to introduce EVs in the Malaysian context. Zeweld et al (2017) conducted a study on the relationship between attitudes and intentions in relation to smallholders' behavioral intentions for sustainable agricultural practices. This study explores the factors that influence smallholder farmers' willingness to adopt and practice sustainable agriculture. In particular, we explored how attitudes toward sustainable farming practices influence farmers' intentions and found that these attitudes had a positive and significant impact on their intentions toward sustainable farming practices. Pankowska et al (2020) explored the relationship between attitudes and intentions in user acceptance of sustainable cloud computing solutions. This study explores what factors influence users' intentions to adopt and use sustainable cloud computing technologies. They showed that attitudes and intentions are positively and significantly correlated in adopting sustainable cloud computing solutions. In particular, we investigate how user attitudes toward sustainability influence their intentions to adopt such solutions.

Subjective Norms & Intention

Subjective norms refer to a person's social satisfaction or expectations for engaging in a particular behavior. It is an important construct in the theory of planned behavior (Ajzen, 1991), which assumes rules that affect human behavior. Learning styles consist of the beliefs and opinions of important individuals, such as family, friends, or cultural institutions. These patterns play an important role in influencing a person's decision-making and behavior. Seok, and Kim (2022), the relationship between subjective norms and intention in the context of organic purchases was examined. The findings revealed that subjective norms significantly influenced individuals' intentions to engage in organic purchasing behavior. Specifically, when individuals perceived stronger social pressure and expectations from others to buy organic products, they were more likely to have higher intentions to make organic purchases. Shou et al (2022), it was found that subjective norms have a significant impact on green innovation within the supply chain. The research revealed that when organizations perceive stronger subjective norms related to environmentally friendly practices from their supply chain partners, they are more likely to engage in green innovation activities. These subjective norms act as social pressures that influence the intentions and actions of organizations toward sustainable practices (Mohamad et al., 2019). The findings emphasize the role of subjective norms in promoting green innovation and highlight the importance of fostering a collective commitment to environmental sustainability among supply chain partners. Hayat et al. (2022), it was found that subjective norms play a significant role in influencing green impulse behavior, particularly in the context of eco-advertising and the ban on plastic. The research revealed that when individuals perceive stronger subjective norms related to corporate social responsibility (CSR) green practices, they are more likely to engage in green impulse behavior such as purchasing eco-friendly products and reducing plastic consumption. Adu-Gyamfi et al (2022), it was found that subjective norms significantly influence individuals' adoption intention of battery swap technology for electric vehicles (EVs). The research demonstrated that when individuals perceive stronger subjective norms, such as societal expectations or

approval from significant others, regarding the adoption of battery swap technology, they are more likely to have higher intentions to adopt this technology for EVs.

Intention & Adoption

Various studies have demonstrated a direct relationship between intention and the adoption of sustainable practices, across different contexts and industries. Kouhizadeh et al (2021) found that stronger intentions to adopt blockchain technology in supply chain operations led to a higher likelihood of engaging in sustainable practices. Similarly, Shalender and Sharma (2021) revealed that individuals with stronger intentions to adopt electric vehicles (EVs) were more likely to actually adopt sustainable practices. Qalati et al (2021) highlighted the direct relationship between intention and the adoption of sustainable practices among SMEs, with social media adoption acting as a mediator. The study suggested that stronger intentions led to a higher likelihood of engaging in sustainable practices, facilitated by the adoption of social media. Moreover, Saurabh and Dey (2021) emphasized the direct relationship between intention and the adoption of sustainable practices in agri-food supply chains utilizing blockchain technology. The study indicated that organizations or stakeholders with stronger intentions to adopt blockchain technology in their supply chain operations were more inclined to engage in sustainable practices, resulting in improved sustainability outcomes. These findings collectively emphasize the significance of intention as a determining factor in the adoption of sustainable practices. Stronger intentions positively influence the actual adoption of sustainable practices, be it in supply chain management, electric vehicle adoption, SMEs, or agri-food supply chains. Understanding the role of intention in driving adoption is crucial for promoting sustainability across various industries and contexts (Zahir et al., 2018).

Perceived Behavioural Control, Intention & Adoption

Perceived behavioral control encompasses an individual's perception of the ease or difficulty associated with performing a particular behavior. As a significant construct in the Theory of Planned Behavior (Ajzen, 1991), it, alongside attitudes and subjective norms, influences behavioral intentions and subsequent actions. Perceived behavioral control reflects an individual's confidence, available resources, and perceived obstacles in executing the behavior. Its role is essential in comprehending and predicting human behavior in diverse domains.In many studies, researchers have examined the relationship between perceived behavioral control, intention, and the adoption of sustainable practices across different contexts. Cop et al (2020) found that intention serves as a mediator between perceived behavioral control and the adoption of sustainable practices in hotels. Individuals who perceive a higher level of control over their behavior, such as through green training and environmental commitment, are more likely to develop stronger intentions to engage in sustainable practices, which ultimately leads to their actual adoption. Similarly, Khan et al. (2022) discovered that intention acts as a mediating factor between perceived behavioral control and the adoption of sustainable practices among tourism SMEs within the context of circular economy initiatives. When tourism SMEs perceive greater control over their behavior and possess dynamic capabilities, it positively influences their intentions to adopt circular economy practices. These intentions significantly impact the actual adoption of sustainable practices and subsequently affect the performance of SMEs in the tourism industry. Furthermore, Lin et al. (2021) revealed that intention acts as a mediator between attitudes and the adoption of marine-responsible environmental behavior. Individuals with positive attitudes towards marine responsible environmental behavior are more likely to have higher

levels of perceived behavioral control. This perceived control, in turn, influences their intentions to engage in such behavior, leading to the actual adoption of sustainable practices pertaining to marine environmental protection.

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

H_1: There is a relationship between attitude and intention of sustainable development practices adoption among employees of online distance learning higher education institutions

H_2: There is a relationship between subjective norms and intention of sustainable development practices adoption among employees of online distance learning higher education institutions.

H_3: There is a relationship between perceived behavioural control and intention of sustainable development practices adoption among employees of online distance learning higher education institutions.

H_4: There is a relationship between perceived behavioural control and adoption of sustainable development practices adoption among employees of online distance learning higher education institutions.

H_5: There is a relationship between intention and adoption of sustainable development practices adoption among employees of online distance learning higher education institutions.

H_6: There is an indirect relationship between perceived behavioural control, intention and adoption of sustainable development practices adoption among employees of online distance learning higher education institutions.

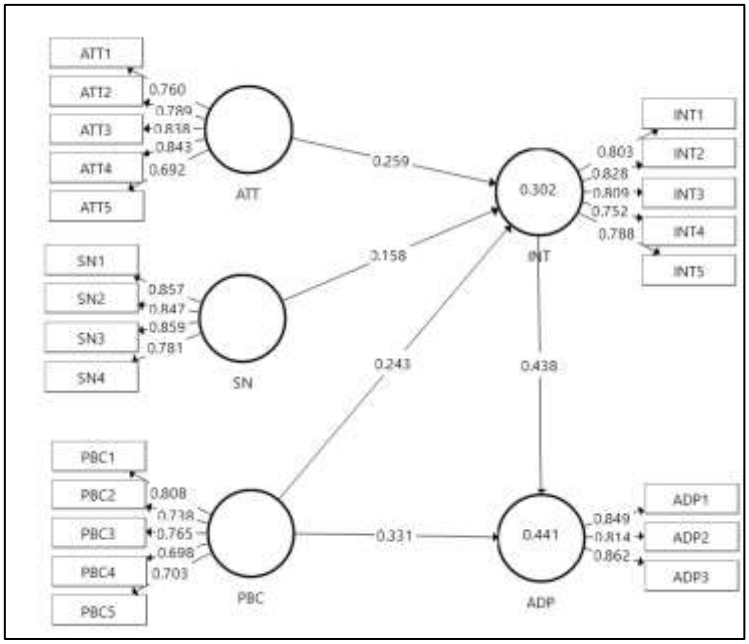

Figure 1: Research Model

Note: ATT=Attitude SN=Subjective Norms PBC=Perceived behavioural Control INT=Intention ADP=Adoption

Methodology

The purpose of this survey was to focus on the staff of online distance learning higher education institutions who were selected as survey respondents. This study used primary data collected using a questionnaire instrument. The survey questionnaire was retrospectively

developed after a thorough evaluation of previous studies in order to obtain an appropriate measure of widespread use and solid reliability and validity. Survey questionnaires were distributed by email to targeted participants using snowball sampling (a non-probabilistic sampling technique for data collection purposes). There was a total of 22 observed variables, including independent, mediating, and dependent variable measurements. Independent variables were a 4-item scale of attitude (Zuhal et al., 2017), a 4-item component of subjective norms (Gelfand et al., 2011), and a 3-item component of perceived behavioral control (Smith, 2015). The mediating variable was intention on 5 scales (Fu et al., 2016) and the dependent variable was adoption on 3 scales (De Cannière et al., 2009). The study measured each constituent scale using a five-point Likert scale ranging from "strongly disagree" to "strongly agree." Of the 495 questionnaires distributed, 413 were returned. This represented a response rate of 75.6% and it was appropriate to perform data analysis using structural equation modeling (SEM). After cleaning the data by removing outliers, it was found 392 questionnaires were clean and ready for data analysis. Table 1 shows the profile of ODL university staff respondents. Multivariate data analysis and proposed hypothesis testing were performed using Smartpls4 software. In addition, Ringle et al (2022) Smartpls4 used for its assessment capabilities.

Respondents' Profile

The data provided show the results of a survey that asked respondents their gender, age, occupation, years of service, and whether they would recommend anything. Regarding gender, 45.7% of respondents identified her as male and 54.3% as female. By age, the largest group of respondents falls in the 41-50-year-old category, accounting for 45.2% of her sample, followed by 31-40 years old with 28.1% of her. The majority of respondents reported working in an academic position, with 77.8% reporting having such a job and 22.2% reporting having an academic job. In terms of years of service, the largest group of respondents fell into her 11-15-year-old category, accounting for 39.5% of the sample. When asked if they would recommend anything, 88.3% of respondents said they would and 11.7% said they would not. These results provide a snapshot of the demographics and opinions of the respondents who participated in the survey.

Data Analysis

Common Method Bias

A common problem in conducting management research is the occurrence of common method bias. This occurs when study variance is assumed to represent structure when it actually represents the measurement method used. To address this issue, the investigators in this study chose Harman's one-factor test method to assess the measurement points. The results of this test show that the main factor only accounted for 39.2% of the variance, indicating that general method bias was not a significant problem in this study. This result is consistent with Podsakoff & Organ (1986) suggestion that bias is not an issue if the principal components explain less than 50% of the variance. This approach helped ensure that the study's results were more robust and valid by reducing the potential impact of common method bias on the results.

Measurement Model

To ensure the reliability and validity of construct measurements, the PLS-SEM algorithm was used in this study. Following the guidelines of Hair et al (2017), two key factors were assessed: the reliability and validity of the external goodness model. The results in Table 1 showed that

all constructs achieved a minimum AVE of 0.553 and a maximum AVE of 0.709, exceeding the minimum convergence validity threshold of 0.5. Furthermore, Table 2 showed that the combined reliability of all constructs ranged from 0.860 to 0.903, exceeding those reported by Hair et al. (2017) Cronbach's alpha values ranged from 0.795 to 0.857. Discriminant validity was assessed by analyzing the cross-loads of the measures, showing that all items had greater loads than their respective cross-loads. As suggested by Henseler et al (2015), the heterotrait-monotrait (HTMT) ratio was further evaluated to confirm the discriminant validity of all seven constituent ratios below 0.9. (Table 3). As a result, this study successfully confirmed the reliability and efficacy of all potential components recommended by (Hair et al., 2014).

Table 1
Construct Reliability & Validity

Construct	Item	Loading	CA	CR	AVE
Adoption	ADP1	0.849	0.795	0.879	0.709
	ADP2	0.814			
	ADP3	0.862			
Attitude	ATT1	0.760	0.845	0.890	0.619
	ATT2	0.789			
	ATT3	0.838			
	ATT4	0.843			
	ATT5	0.692			
Intention	INT1	0.803	0.856	0.896	0.634
	INT2	0.828			
	INT3	0.809			
	INT4	0.752			
	INT5	0.788			
Perceived Behavioral Control	PBC1	0.808	0.797	0.860	0.553
	PBC2	0.738			
	PBC3	0.765			
	PBC4	0.698			
	PBC5	0.703			
	SN1	0.857	0.857	0.903	0.700
Subjective Norms	SN2	0.847			
	SN3	0.859			
	SN4	0.781			

Table 2
Hetrotrait-Monotrait (HTMT) Ratio

	ADP	ATT	INT	PBC
ATT	0.656(0.566, 0.738)			
INT	0.718(0.633, 0.790)	0.562(0.457, 0.657)		
PB				
C	0.670(0.571, 0.757)	0.807(0.739, 0.873)	0.579(0.476, 0.677)	
SN	0.551(0.442, 0.650)	0.480(0.358, 0.596)	0.426(0.307, 0.535)	0.511(0.394, 0.620)

Note: A two-tail percentile bootstrap test at a 5% confidence interval (2.5%, 97.5%) with 5,000 sub-samples was performed.

Structural Model

Evaluation of the structural model was performed by simultaneously evaluating the pathway coefficient (β) and the coefficient of determination (R^2) (Hair et al., 2017). This study used the PLS method to launch 5000 subsamples to verify the significant level of path coefficients. Path coefficients (beta), t-statistics, p-values, and statistical results of hypothesis tests for confidence intervals are shown in Table 3. For hypothesis 1, statistical results showed that attitude had a positive and significant effect on intention (β=0.259, t=4.282, p=0.000), thus supporting H1. For hypothesis 2, the results showed that subjective norms had a positive and significant effect on intention (β=0.158, t=3.369, p=0.001), thus supporting H2 well. For hypothesis 3, statistical results indicated that perceived behavioral control positively and significantly affected intention (β=0.243, t=4.171, p=0.000), thus supporting H3. For hypothesis 4, perceived behavioral control has been shown to have a positive and significant direct effect on adoption (β=0.331, t=6.880, p=0.000), thus supporting H4. Hypothesis 5 was shown to positively and significantly influence of intention on adoption (β=0.438, t=9.496, p=0.000), favoring H5. Finally, for hypothesis 6, the intention was shown to positively and significantly mediate the relationship between perceived behavioral control and adoption (β=0.106, t=2.947, p=0.000, LLCI=0060, ULCI=0.160) therefore H6 was favored and a summary of hypothesis testing results is shown in Table 3. Table 3 also provided information on the effect size, which is a measure of the magnitude of an effect that is not affected by the size of the sample. The values of f2 were classified as small (0.020 to 0.150), medium (0.150 to 0.350), or large (0.350 or greater), according to Cohen's criteria (1992). The effect sizes in this study ranged from small (0.028) to large (0.263).

The intrinsic value inflation rate (VIF) was all below the more liberal threshold of 5, with a high of 2.134 (Table 3). Collinearity at this level allows size comparisons and interpretation of structural model coefficients. This recruitment demonstrated a high degree of explained variance for the endogenous construct with an R^2 of 0.441 (Figure 1). For mediation structural intent, the model was shown to explain a 30.2% variance in structure (R^2=0.302). More importantly, the model's out-of-sample predictive ability was to draw inferences and make management suggestions. The PLSpredict method was employed for this evaluation (Shmueli et al. 2016, 2019). Q2 predictions higher than 0 indicated that PLS-SEM predictions were higher than standard naive mean prediction results (Table 4). Moreover, the RMSE (root mean square error) values of the PLS-SEM predictions were lower than the RMSE values of the linear model (LM) prediction benchmark 6 out of 8 times. These results proved that the proposed model has predictive power (Table 4).

Finally, the Importance Performance Analysis (IPMA) compares the importance of the latent variables (overall effect) and their performance (mean on a scale of 0 to 100) in explaining acceptance, as shown in Table 8. Can be combined. Management (Ringle and Sarstedt 2016; Hair et al. 2018). In terms of overall impact, intentions influenced adoption most strongly (0.438), followed by perceived behavioral control (0.4377), attitudes (0.113), and subjective norms (0.069). In terms of performance scores, perceived behavioral control had the highest performance score (67.446) and intention had the lowest performance score (61.017). The intention is therefore the most important for recruitment but at the same time the lowest achievement value. Therefore, the top management of ODL higher education institutions should pay more attention to and emphasize activities to improve the performance of their employees' intentions.

Table 3
Hypotheses Testing Results & f^2

Hypotheses	VIF	Path	T Statistics	P Values	2.50%	97.50%	f^2	Decision
ATT -> INT	1.893	0.259	4.282	0.000	0.137	0.370	0.051	*Supported*
SN -> INT	1.265	0.158	3.369	0.001	0.064	0.245	0.028	*Supported*
PBC -> INT	1.912	0.243	4.171	0.000	0.128	0.357	0.044	*Supported*
PBC -> ADP	1.306	0.331	6.880	0.000	0.229	0.417	0.150	*Supported*
INT -> ADP	1.309	0.438	9.496	0.000	0.341	0.523	0.263	*Supported*
PBC -> INT -> ADP		0.106	2.947	0.000	0.060	0.160		*Supported*

Table 4
Plspredict

	PLS RMSE	LM RMSE	PLS-LM	Q^2_predict
ADP2	0.636	0.628	0.008	0.196
ADP1	0.632	0.622	0.010	0.300
ADP3	0.680	0.691	-0.011	0.229
INT5	0.617	0.631	-0.014	0.190
INT1	0.617	0.618	-0.001	0.226
INT2	0.626	0.640	-0.014	0.187
INT4	0.684	0.700	-0.016	0.146
INT3	0.677	0.679	-0.002	0.146

Table 4
Importance-Performance Map Analysis (IPMA)

	Total Effect	Performance
ATT	0.113	66.669
INT	0.438	61.017
PBC	0.437	67.466
SN	0.069	67.156

Discussion & Conclusion

The statistical analysis conducted above reveals that attitude, subjective norms, and perceived behavioral control play a direct and positive role in influencing intention. Particularly, the attitude has the strongest impact on intention (β=0.259). This suggests that online distance learning (ODL) higher education institutions should prioritize the development of effective strategies to shape the attitudes of their employees. It is crucial for organizations aiming to foster a culture of sustainability to enhance employees' attitudes toward the adoption of sustainable development practices. By implementing effective strategies, businesses can encourage employees to embrace sustainability principles and actively contribute to sustainable initiatives. To achieve this, ODL higher education institutions should offer comprehensive training and education programs that focus on sustainable development practices. These programs should aim to enhance employees' understanding of environmental and social issues while emphasizing the importance of sustainability and the role employees play in driving positive change. It is also essential for leaders within ODL institutions to demonstrate a strong commitment to sustainability and serve as role models for their employees. When leaders actively engage in sustainable

practices and communicate their support, it influences employees' attitudes and motivates them to follow suit. Engaging employees in sustainability initiatives is crucial, and ODL institutions should involve them in decision-making processes and provide opportunities for contribution. Encouraging employees to propose ideas, form green teams, and participate in sustainability projects can boost their motivation and sense of ownership. Furthermore, ODL institutions should recognize and reward employees who actively adopt sustainable practices. This can be done through formal recognition programs, incentives such as bonuses or additional benefits, or by offering career advancement opportunities for sustainability champions. In order to emphasize the significance of sustainable practices, ODL higher education institutions should integrate sustainability goals and metrics into employees' performance evaluations. This integration ensures that sustainability becomes a core aspect of job responsibilities and performance expectations. Additionally, establishing transparent communication channels is vital to facilitate dialogue on sustainability-related matters. Employees should be encouraged to share ideas, concerns, and feedback regarding sustainable practices, and timely and constructive responses should be provided.

Perceived behavioral control emerged as another influential factor in intention (β=0.243). Strengthening employees' perception of control over their behavior is crucial for encouraging their intention to embrace sustainable development practices. ODL higher education institutions should prioritize the provision of comprehensive training programs that equip employees with the necessary knowledge and skills to engage in sustainable practices. This training should encompass areas such as sustainable technologies, resource management, and environmentally-friendly behaviors. By enhancing their competencies, employees will develop a greater sense of confidence in their ability to adopt and implement sustainable practices. To facilitate employees' engagement in sustainable behaviors, ODL higher education institutions need to establish clear guidelines and procedures that outline the specific steps and actions required. Providing employees with detailed instructions, checklists, and decision-making frameworks will aid in their decision-making process and bolster their perceived control over sustainable actions. It is essential for ODL higher education institutions to ensure that employees have access to the necessary resources and support systems to facilitate the adoption of sustainable practices. This may include providing tools, equipment, and technologies that enable sustainable behaviors, as well as dedicated sustainability teams, experts, or mentors who can offer guidance and support. Setting clear goals and targets related to sustainable practices and providing regular feedback to employees on their progress is crucial. Clear goals help employees perceive a sense of control over their actions, and feedback allows them to evaluate their performance and make necessary adjustments. ODL higher education institutions should strive to foster a culture of empowerment and autonomy, where employees are encouraged to take ownership of their sustainable behaviors. Providing opportunities for employees to contribute their ideas, make decisions, and actively participate in sustainable initiatives empowers them and enhances their perceived control over their actions

In online distance learning (ODL) higher education, it is crucial for institutions to address the influence of subjective norms on the intention to adopt sustainable development practices through strategic approaches. Subjective norms encompass the shared beliefs, attitudes, and behaviors that prevail within a specific social group or community. By effectively utilizing subjective norms, ODL institutions can cultivate a culture of sustainability and encourage

employees to embrace sustainable practices. One effective strategy involves creating awareness and promoting subjective norms that endorse sustainability. Institutions can accomplish this by actively communicating the significance of sustainable development practices and highlighting their positive impact on the environment and society. Various channels such as newsletters, emails, intranet platforms, and social media can be utilized for the consistent sharing of success stories, and best practices, and for showcasing sustainability champions within the organization. This reinforcement helps strengthen the subjective norms of adopting sustainable behaviors. Another successful strategy entails providing social incentives that foster sustainable practices. ODL higher education institutions can implement recognition programs that acknowledge and reward employees who actively engage in sustainable behaviors. Such recognition may include public acknowledgment, incentives like bonuses or additional benefits, or opportunities for career advancement for that advocating sustainability. These social incentives not only motivate employees but also create a sense of social pressure to conform to sustainable norms. Additionally, facilitating collaboration and peer influence plays a pivotal role in shaping subjective norms. ODL institutions can promote the formation of sustainability-focused groups or teams where employees can share ideas, collaborate on projects, and support each other in adopting sustainable practices. Encouraging collective action and positive role modeling within these groups creates a supportive environment that reinforces sustainable subjective norms. Leveraging technology is another avenue for ODL institutions to facilitate social influence. Online platforms and communities can be leveraged to connect employees, foster knowledge sharing, and establish a sense of belonging to a sustainability-conscious community. Discussion forums, online events, and virtual networking opportunities can encourage interactions and the exchange of ideas related to sustainable development practices, further strengthening the influence of subjective norms.

Theoretical & Practical Implications

Examining the impact of attitude, subjective norms, and perceived behavioral control on intentions, as well as the mediating role of intention in the relationship between perceived behavioral control and adoption in online distance learning (ODL) education, carries various theoretical implications. Firstly, gaining insights into the connection between attitude, subjective norms, perceived behavioral control, and intentions provides a deeper understanding of the factors that drive individuals to adopt sustainable practices in ODL education. This research contributes to the Theory of Planned Behavior, which asserts that attitudes, subjective norms, and perceived behavioral control collectively influence behavioral intentions. By investigating these factors within the ODL education context, researchers can expand the theory's applicability and enrich its theoretical foundations. Moreover, recognizing intention as a mediator between perceived behavioral control and adoption enhances comprehension of the underlying mechanisms that link individuals' beliefs, attitudes, and behaviors. This discovery supports the notion that intentions play a significant role in translating perceived behavioral control into actual behavior. It aligns with the idea that individuals are more inclined to embrace sustainable practices when they possess a strong intention to do so, influenced by their attitudes, subjective norms, and perceived control. Furthermore, the research contributes to the realm of ODL education by emphasizing the importance of these psychological factors in driving sustainable behavior. ODL institutions can leverage these theoretical insights to devise focused interventions and strategies that promote sustainable practices among their students and employees. By

prioritizing the enhancement of attitudes, subjective norms, and perceived control, institutions can shape individuals' intentions and facilitate the adoption of sustainable behaviors in the ODL environment. This study has practical implications for promoting sustainable practices and driving behavior change in online distance learning (ODL) education through understanding the influence of attitude, subjective norms, and perceived behavioral control on intentions, as well as the mediating role of intention in the relationship between perceived behavioral control and adoption. To begin with, comprehending the role of attitude, subjective norms, and perceived behavioral control can guide the development of targeted interventions and campaigns to foster sustainable behaviors in ODL education. Institutions can design educational programs that emphasize sustainability's importance, highlight the benefits of sustainable practices, and address specific beliefs and attitudes influencing individuals' intentions. By tailoring these interventions to the unique characteristics of the ODL environment, such as remote learning and virtual interactions, institutions can effectively promote sustainable behaviors among students and employees. Furthermore, recognizing the mediating role of intention suggests that interventions should prioritize enhancing individuals' intentions to adopt sustainable practices. Strategies implemented by ODL institutions can focus not only on knowledge and awareness but also on building commitment and personal responsibility toward sustainability. Goal-setting exercises, action plans, and encouraging self-reflection can help align personal values with sustainable behaviors. By reinforcing the link between intention and behavior, institutions can increase the likelihood of actual adoption and implementation of sustainable practices. Additionally, understanding the influence of subjective norms on intentions underscores the importance of creating a supportive social environment that promotes sustainability. ODL institutions can facilitate peer networks, encourage collaboration, and provide platforms for sharing experiences and success stories related to sustainable practices. By fostering a sense of community and leveraging peer influence, institutions can harness the power of subjective norms to encourage individuals to adopt sustainable behaviors.

Limitations of the Study

It is important to acknowledge the limitations of this study and consider them when interpreting the findings and their application in real-world scenarios. One notable limitation is the reliance on participants' self-perceptions and subjective assessments, which can introduce response biases like social desirability bias. This bias may lead participants to provide answers they believe are socially acceptable rather than reflecting their true beliefs or behaviors. Another limitation arises from the cross-sectional nature of many studies in this field, which hinders the establishment of causality. Although associations between variables can be identified, determining the direction of relationships or inferring causation is challenging. Conducting longitudinal studies that track individuals over time would provide more robust evidence regarding the causal links between attitude, subjective norms, perceived behavioral control, intention, and adoption. Furthermore, the studied variables may not fully capture the complex interplay of various factors influencing behavior in the online distance learning (ODL) environment. Other individual and contextual factors, such as personal values, organizational culture, or technological constraints, may also shape intentions and behaviors related to sustainability in ODL education.

Suggestions for Future Studies

In future studies, it is recommended to explore various avenues for further research regarding the influence of attitude, subjective norms, and perceived behavioral control on intentions, as well as the mediating role of intention on the relationship between perceived behavioral control and adoption in online distance learning (ODL) education. Firstly, researchers can delve into the examination of contextual factors unique to the ODL environment. Investigating how technological features, course design and instructional strategies impact attitude, subjective norms, perceived behavioral control, and intentions toward sustainable practices in ODL education would yield valuable insights. Gaining an understanding of the interplay between these contextual factors and individual psychological factors would contribute to a more comprehensive comprehension of sustainable behavior within the ODL context. Furthermore, researchers should consider exploring the potential moderating effects of individual characteristics, such as prior knowledge, self-efficacy, and environmental awareness, on the relationship between attitude, subjective norms, perceived behavioral control, intention, and adoption. This exploration would provide tailored insights into how these individual differences shape the pathways toward sustainable behavior in ODL settings, facilitating the design of interventions and educational programs that effectively target and address these specific characteristics. Lastly, conducting comparative studies across different ODL institutions or cultural contexts would be advantageous. By examining variations in attitude, subjective norms, perceived behavioral control, and intention towards sustainable practices, researchers can identify context-specific factors and develop targeted strategies to promote sustainable behavior within diverse ODL settings. This approach would enhance understanding of the nuanced influences and dynamics of sustainable behavior, considering the cultural, institutional, and contextual variations present in ODL education.

Conclusion

In conclusion, the examination of attitude, subjective norms, and perceived behavioral control and the mediating role of intention in the relationship between perceived behavioral control and adoption in online distance learning (ODL) education provides valuable insights for promoting sustainable practices in this context. The results underscore the importance of cultivating positive attitudes, establishing supportive subjective norms, and enhancing individuals' sense of control over their behavior. By implementing targeted interventions and strategies that address these factors, it becomes possible to stimulate the formation of intentions and translate perceived behavioral control into the actual adoption of sustainable practices. This understanding of the underlying dynamics contributes to the development of customized approaches to fostering sustainability in ODL education, with the ultimate goal of generating positive environmental and social outcomes.

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