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RESEARCH ARTICLE

Explaining Electric Vehicle Purchase Intention among Cambodian Generation Z: An Extended TPB Approach

Chhayna Cheng [a]

[a] Faculty of Business Administration, BELTEI International University, Phnom Penh, Cambodia

KEYWORDS
Attitude; Electric vehicles; Generation Z; Perceived behavioural control; Purchase intention; Subjective norm

CORRESPONDING AUTHOR
The corresponding Author 's Chhayna Cheng
chhaynacheng@gmail.com

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ABSTRACT
This study examines the psychological and social determinants of electric vehicle (EV) purchase intention among Cambodian Generation Z university students, addressing limited evidence on sustainable mobility adoption in emerging markets. Extending the Theory of Planned Behavior (TPB), the study investigates the direct relationships of subjective norm, attitude, and perceived behavioural control with purchase intention, alongside the mediating role of attitude. Using a quantitative cross-sectional design, survey data from 280 undergraduate students at BELTEI International University were analysed through partial least squares structural equation modelling (PLS-SEM). The findings reveal significant positive associations between purchase intention and perceived behavioural control (β = 0.411), attitude (β = 0.323), and subjective norm (β = 0.205), with perceived behavioural control emerging as the strongest direct predictor. Subjective norm (β = 0.417) and perceived behavioural control (β = 0.466) were also positively associated with attitude. Furthermore, attitude partially mediated the relationships between subjective norm and purchase intention (β = 0.135) and between perceived behavioural control and purchase intention (β = 0.150). The model explained 73.1% of the variance in purchase intention. The study contributes to TPB-based sustainable consumption research by highlighting the complementary roles of perceived ownership feasibility, social influence, and attitude formation in Cambodia's developing EV market. The findings offer practical insights for consumer engagement and electric mobility initiatives, while remaining specific to the surveyed university population.

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1. INTRODUCTION

Technological advancement has accelerated innovation in the automotive industry, particularly through the rapid development of electric vehicles (EVs) (Yeğin & Ikram, 2022). Global EV adoption has increased substantially but varies across countries. In 2023, adoption was highest in Norway (93%), followed by Sweden (60%) and China (38%), while the United Kingdom and Germany each recorded approximately 24%, and the European Union averaged 22% (Fesli & Ozdemir, 2024). Adoption was lower in the United States (10%), India (2%), and South Africa (1%), highlighting substantial market differences (Fesli & Ozdemir, 2024). Within ASEAN, supportive policies have accelerated EV growth, with Thailand recording a 78.7% EV sales share in 2023 and Indonesia 8% in

the first quarter of 2023 (Direkudomsak, 2024). In Cambodia, EV development remains highly dependent on imports, although registrations increased from more than 600 vehicles in 2023 to 14,534 by February 2024, including electric cars, motorcycles, and three-wheelers (Ministry of Public Works and Transport [MPWT], 2024). The Royal Government of Cambodia has also introduced the National Policy on the Development of Electric Vehicles (2024–2030) to promote investment, charging infrastructure, and EV development (MPWT, 2024).

EVs provide technological, economic, functional, and environmental benefits, including cost savings, innovation, improved air quality, reduced emissions, and climate change mitigation (Wang et al., 2022; Zhu et al., 2023). These developments emphasize the need to understand factors influencing EV purchase intention, particularly among younger consumers. Generation Z (Gen Z) represents an important group for the future development of sustainable transportation because of its growing purchasing influence and openness to technology-oriented consumption (Rahmawati et al., 2024). Previous studies have identified psychological, social, and behavioural factors influencing EV purchase intention, including perceived benefits, social influence, affordability, and operational convenience (Yeğin & Ikram, 2022; Buhmann et al., 2024). The Theory of Planned Behavior (TPB) provides an appropriate framework for explaining behavioural intention through subjective norm (SN), attitude (ATT), and perceived behavioural control (PBC) (Ajzen, 1991), which have been shown to influence EV purchase intention (Yeğin & Ikram, 2022; Buhmann et al., 2024). Despite growing interest in EV adoption, several research gaps remain. First, a contextual gap exists in research on EV purchase intention among Gen Z university students in developing countries, particularly Cambodia, where the EV market is still developing. Second, a conceptual gap concerns the focus on specific vehicle types, particularly electric cars, in previous research.

This study examines general EV purchase intention toward electrically powered vehicles without restricting the behavioral target to a particular vehicle type, reflecting individuals' diverse transportation needs and preferences. Third, a methodological gap concerns the limited application of the TPB and Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine general EV purchase intention among Gen Z university students in developing countries. Additionally, the original TPB positions ATT, SN, and PBC as predictors of behavioral intention; this study extends the framework by examining SN and PBC as additional antecedents of ATT. In Cambodia, social expectations from family and peers may shape students' evaluations of EVs, while perceived affordability and access to charging infrastructure may influence their attitudes toward EV purchasing. Therefore, this study applies TPB using PLS-SEM to examine the associations of SN, ATT, and PBC with EV purchase intention (EVPI), the associations of SN and PBC with ATT, and the mediating role of ATT in the relationships between SN, PBC, and EVPI among Cambodian Gen Z university students. By identifying the relative importance of these relationships, the study provides context-specific evidence for comparison with findings from other markets and offers practical implications for EV businesses, policymakers, and other stakeholders seeking to encourage electric mobility adoption.

2. LITERATURE REVIEW

2.1. Electric Vehicles and Generation Z Adoption

Electric vehicles (EVs) refer broadly to vehicles that use electric power for propulsion and include electric cars, electric motorcycles, electric bicycles, hybrid electric vehicles, plug-in hybrid electric vehicles, and battery electric vehicles (Bektaş & Akyıldız Alçura, 2024). Beyond their potential to reduce emissions and operating costs, EV adoption is a consumer decision shaped by environmental considerations, social influence, and perceived ability to adopt new transportation technologies (Bektaş & Akyıldız Alçura, 2024). These characteristics make behavioural theories particularly relevant for explaining consumers' intentions to purchase EVs. Additionally, TPB provides an appropriate framework because it explains behavioral intention through ATT, SN, and PBC (Ajzen, 1991). ATT refers to Gen Z students' evaluations of purchasing an EV, SN reflects perceived social pressure from family and peers, and PBC represents their perceived ability to afford an EV (Ajzen, 1991). These constructs make TPB suitable for explaining EV purchase intention among Cambodian Generation Z university students.

Gen Z, generally defined as individuals born between 1997 and 2012, is an increasingly important consumer segment because of its growing purchasing influence and openness to technology-oriented consumption (Prameka et al., 2021). Recent TPB-based studies in the USA, Australia, Indonesia, Malaysia, and Vietnam provide evidence that ATT, SN, and PBC are relevant to EV adoption intention among younger consumers (Pamidimukkala et al., 2025; Stork, 2022; Messias et al., 2025; Thwe et al., 2025; Tran et al., 2026). These studies highlight the importance of examining Gen Z's ATT, SN, and PBC to better understand their EV purchase intention and potential future demand. However, evidence from these contexts cannot necessarily be generalized to Cambodia, where EV adoption is developing under different economic, infrastructural, and market conditions. In Cambodia, existing EV research has primarily emphasized practical adoption considerations, including affordability, operating costs, charging time, incentives, maintenance information, and product availability (Keo, 2023; Jung et al., 2025).

Although these factors identify important market barriers, they provide limited explanation of the psychological mechanisms underlying consumers' purchase intentions. In particular, empirical applications of TPB among Cambodian Gen Z university students remain limited. To address this gap, this study extends the original TPB by examining SN and PBC as antecedents of ATT, considering how family and peer influence, perceived affordability, and charging accessibility may shape students' evaluations of EVs. Using PLS-SEM, the study examines how SN, ATT, and PBC relate to general EV purchase intention among Cambodian Gen Z university students, encompassing different types of electrically powered vehicles rather than focusing solely on electric cars. It also examines the mediating role of ATT in the relationships between

SN, PBC, and EV purchase intention. Overall, this study contributes context-specific evidence on the applicability of the extended TPB in Cambodia's developing EV market.

2.2. Theory of Planned Behavior

This study is theoretically grounded in the Theory of Planned Behavior (Ajzen, 1991), which extends the Theory of Reasoned Action by incorporating perceived behavioural control. TPB proposes that behavioural intention is shaped by ATT, SN, and PBC, reflecting personal evaluation, social influence, and perceived ability to perform a behavior, respectively (Ajzen, 1991). These dimensions are relevant to EV purchase decisions because adoption involves personal evaluation, social influence, and perceptions of affordability, infrastructure, and adoption capability. Prior studies have applied TPB to e-waste recycling, online shopping, and mobile applications across different countries (Botetzagias et al., 2024; Sutisna & Handra, 2022; Hansani & Karunarathne, 2021). However, TPB relationships may vary across social, economic, and technological contexts. In Cambodia, an emerging EV market, evidence on the psychological determinants of EV purchase intention among Gen Z remains limited. Hence, this study examines the associations of SN, ATT, and PBC with EV purchase intention, the effects of SN and PBC on ATT, and the mediating role of ATT among Cambodian Gen Z.

2.3. Hypothesis Development

2.3.1. Subjective Norm and Attitude

Subjective norm refers to perceived social pressure to perform or avoid a behavior (Hamid et al., 2025). For Cambodian Gen Z, EV purchase decisions may be influenced by family, friends, and other important social groups, particularly because EV adoption involves unfamiliar technology, substantial financial commitment, and developing infrastructure. Social support therefore strengthens consumers' confidence in considering EV ownership (Yeğin & Ikram, 2022). Empirical studies further report a positive relationship between SN and EV purchase intention (Ji et al., 2024; Habbe et al., 2025). Thus, the following hypothesis is proposed:

H1: Subjective norm is positively associated with electric vehicle purchase intention among Cambodian Generation Z university students.

2.3.2 Attitude and Electric Vehicle Purchase Intention

Attitude reflects an individual's favorable or unfavorable evaluation of a behavior (Jaiswal et al., 2022). In the Cambodian EV context, consumers who perceive EVs as beneficial, practical, and desirable are more likely to develop stronger purchase intentions. This relationship is supported by previous EV studies across different contexts (Mohd Noor et al., 2025; Purwanto et al., 2025). Thus, the following hypothesis is proposed:

H2: Attitude is positively associated with electric vehicle purchase intention among Cambodian Generation Z university students.

2.3.3 Perceived Behavioural Control and Electric Vehicle Purchase Intention

Perceived behavioural control refers to the perceived ease or difficulty of performing a behavior, based on available resources, abilities, and anticipated barriers (Pamidimukkala et al., 2025). For Cambodian Gen Z, perceptions of affordability, charging access, maintenance, and ownership convenience may determine whether EV adoption is viewed as achievable. Higher perceived control should therefore strengthen purchase intention. Previous studies support a positive relationship between PBC and EV purchase intention, including among younger consumers (Buhmann et al., 2024; Pamidimukkala et al., 2024). Hence, the following hypothesis is proposed:

H3: Perceived behavioural control is positively associated with electric vehicle purchase intention among Cambodian Generation Z university students.

2.3.4 Subjective Norm and Attitude

Within TPB, subjective norm can shape how individuals evaluate a behavior (Yasa et al., 2022). For Cambodian Gen Z, encouragement from family, friends, and other reference groups may increase the perceived desirability and social acceptability of EV ownership, thereby fostering more favorable attitudes. Previous research supports the positive effect of SN on attitudes toward technology adoption and pro-environmental behavior (Kim et al., 2021; Pamidimukkala et al., 2024). Thus, the following hypothesis is proposed:

H4: Subjective norm is positively associated with electric vehicle purchase intention among Cambodian Generation Z university students.

2.3.5 Perceived Behavioural Control and Attitude

Perceived Behavioural Control is also associated with attitude because consumers who perceive EV ownership as affordable, accessible, and manageable are more likely to evaluate it favorably (Ji et al., 2024). This is particularly relevant in Cambodia, where perceptions of resources and practical barriers shape how Gen Z evaluates EV adoption. Previous studies have found positive effects of PBC on attitudes toward technology adoption and sustainable behavior (Yasa et al., 2022; Buhmann et al., 2024). Thus, the following hypothesis is proposed:

H5: Perceived behavioural control is positively associated with attitude toward electric vehicle purchase among Cambodian Generation Z university students.

2.3.6 Mediating Role of Attitude

Within TPB, attitude can mediate the translation of social influence and perceived behavioural control into behavioural intention (Yeğin & Ikram, 2022). In the Cambodian EV context, social support and perceived control over affordability, access, and ownership foster favorable attitudes, which subsequently strengthen purchase intention. Previous studies support the mediating role of attitude between subjective norm and behavioural intention (Gundala et al., 2022) and between perceived behavioural control

and EV purchase intention (Yasa et al., 2022). Therefore, the following hypotheses are proposed:

H6: Attitude mediates the association between subjective norm and electric vehicle purchase intention among Cambodian Generation Z university students.

H7: Attitude mediates the association between perceived behavioural control and electric vehicle purchase intention among Cambodian Generation Z university students.

2.4. Conceptual Framework

Based on prior studies, this study develops a TPB-based framework to examine EV purchase intention among Cambodian Generation Z university students. The framework examines the relationships of subjective norm, attitude, and perceived behavioral control with EV purchase intention, the relationships of subjective norm and perceived behavioral control with attitude, and the mediating role of attitude, as presented in Figure 1.

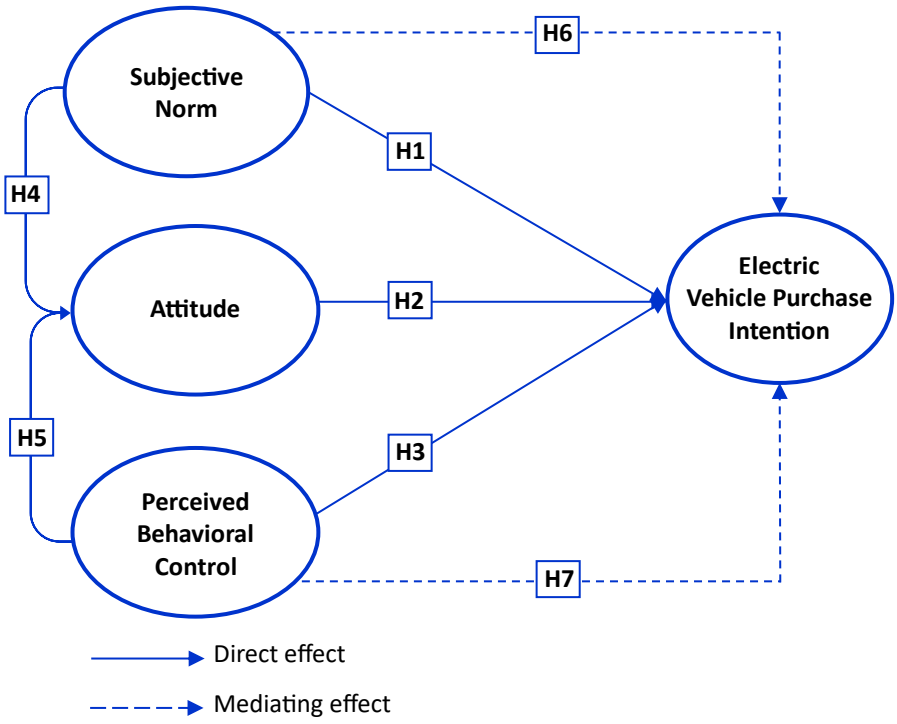


Figure 1. Conceptual Framework
Source. Adapted from Ajzen (1991)

3. METHODOLOGY

3.1 Research Design

This study employed a quantitative correlational research design to examine the relationships among SN, PBC, ATT, and EVPI among Cambodian Gen Z university students. A correlational design was appropriate because the study examined associations among these variables without manipulating them. Specifically, the research model examined the relationships between SN, PBC, and ATT and EVPI; the relationships between SN and PBC and ATT; and ATT's mediating role in the associations

among SN, PBC, and EVPI. Data were collected using a structured questionnaire and analyzed using PLS-SEM. Overall, this approach was suitable for assessing the proposed relationships and statistical indirect associations within the study model.

3.2 Sample and Sampling Design

The study targeted Gen Z undergraduate students from four faculties, including Business Administration, Finance and Banking, Law, and Information Technology, at BELTEI International University, across Campus 1 and Campus 2. The minimum sample size was assessed using G*Power through an a priori power analysis for linear multiple regression (Faul et al., 2009). The analysis specified a medium effect size (f2 = 0.15), a significance level of 0.05, statistical power of 0.95, and three predictors of purchase intention. The analysis indicated a minimum required sample size of 119 respondents. Accordingly, 280 respondents were recruited for three main reasons. First, the sample exceeded the minimum required by the power analysis, providing a greater margin for detecting relationships among the predictors and purchase intention under the specified assumptions.

Second, the larger sample supported more stable parameter estimation and greater robustness in the planned PLS-SEM analysis. Third, it provided a buffer against potentially unusable responses and strengthened the practical adequacy of the dataset for the planned analyses. Convenience sampling was employed because eligible participants were readily accessible at the selected campuses, making recruitment practical and time-efficient while facilitating access to Gen Z undergraduates who met the study's eligibility criteria. Participants were Gen Z undergraduates with basic awareness of electric vehicles, which are powered by electricity and include electric cars, motorbikes, and bicycles. As convenience sampling is a non-probability technique, the sample may not fully represent the broader population of Cambodian Gen Z undergraduates, limiting the generalizability of the findings beyond the study context.

3.3 Research Instruments

Table 1 presents the questionnaire, which comprised two sections covering demographics and SN, PBC, ATT, and EVPI. Items were adapted from validated studies for the Cambodian EV context and translated into Khmer using back-translation by two bilingual experts. Constructs were measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), with mean scores interpreted following Koo and Yang (2025).

Table 1. A summary of the construct measurement

Constructs	Items	Sources
Subjective Norm	SN1–SN5	Buhmann et al. (2024); Thwe et al. (2025)
Attitude	ATT1–ATT5	Yeğin & Ikram (2022); Buhmann et al. (2024)
Perceived Behavioural Control	PBC1–PBC5	Yeğin & Ikram (2022); Thwe et al. (2025)
Electric Vehicle Purchase Intention	EVPI1–EVPI6	Al-Amin et al. (2016); Buhmann et al. (2024)

Source: Authors' adaptation based on previous validated studies

3.4. Data Collection Procedures

Data were collected in two stages from Generation Z undergraduate students across four faculties at BELTEI International University, Campuses 1 and 2. A pilot test involving 100 participants was conducted from May 13 to 18, 2026, to assess item clarity and instrument reliability, followed by minor wording revisions. The main survey involved 280 participants from May 20 to June 23, 2026, using a Google Forms questionnaire distributed through Telegram. At Campus 2, the researcher coordinated with the vice-deans of the participating faculties and lecturers before visiting each class for approximately 15 minutes to explain the study and invite students to participate. At Campus 1, due to the distance from the researcher, data collection was coordinated with lecturers, who helped distribute the survey invitation and questionnaire link to students. Participation was voluntary, and informed consent was obtained before respondents completed the questionnaire. Respondents were informed about the study's purpose and the confidentiality of their responses. No formal institutional ethics approval letter was obtained for this study.

3.5. Data Analysis Method

The collected data were coded, screened, and cleaned using Microsoft Excel 2019 and IBM SPSS Statistics 27. Principal Component Analysis with Varimax rotation was conducted to examine the preliminary factor structure of the measurement items. Validity analysis was assessed using the Kaiser–Meyer–Olkin (KMO) measure, with values of at least 0.60 considered acceptable, and Bartlett's test of sphericity, with p-values below 0.05 indicating suitability for factor analysis (Hair et al., 2014). Components were retained based on eigenvalues greater than 1, factor loadings of at least 0.60, and cumulative explained variance of at least 60% (Hair et al., 2014). Internal consistency reliability was assessed using Cronbach's alpha, with values of at least 0.70 considered acceptable, and average inter-item correlation (AIIC) (Hair et al., 2022; Gharaibeh et al., 2017). The proposed model was subsequently assessed using PLS-SEM in SmartPLS 3, following the two-stage approach described by Hair et al. (2022). PLS-SEM was selected to examine the relationships among the TPB constructs and purchase intention, explain the variance in purchase intention, and assess the model's predictive performance.

Although covariance-based structural equation modeling (CB-SEM) is also suitable for evaluating established theoretical models, PLS-SEM was used to align the analysis with the study's variance-explanation objective. Predictive performance was additionally assessed using PLSpredict to evaluate the model's ability to predict observations beyond those used for model estimation. The measurement model was evaluated for indicator reliability, internal consistency reliability, convergent validity, and discriminant validity using outer loadings, Cronbach's alpha, composite reliability (CR), rho_A, average variance extracted (AVE), and the Fornell–Larcker criterion. The structural model was assessed using variance inflation factors (VIF), the coefficient of determination (R^2), effect sizes (f^2), and path coefficients (β). Predictive relevance and out-of-sample predictive performance were examined using the appropriate predictive assessment

procedures. Hypotheses were tested using bootstrapping with 5,000 subsamples to assess direct and indirect effects, including the mediating role of attitude (ATT). The evaluation criteria are presented in Table 2.

Table 2. Evaluation criteria for PLS-SEM analysis

Model Aassessments	Criteria	Sources
Outer loading	≥ 0.70	Hair et al. (2022)
α	≥ 0.70	Hair et al. (2022)
CR	≥ 0.70	Hair et al. (2022)
AVE	≥ 0.50	Hair et al. (2022)
VIF	< 5.00	Hair et al. (2022)
β	t-value > 1.96 and p-value < 0.05	Hair et al. (2022)
R^2	0.25 = weak, 0.50 = moderate, and 0.75 = substantial	Hair et al. (2022)
f^2	0.02 = small, 0.15 = medium, and 0.35 = large	Hair et al. (2022)
Q^2	$Q^2 > 0$	Hair et al. (2022)
Bootstrapping	5,000 subsamples	Hair et al. (2022)

Source: Adopted from Hair et al. (2022)

4. RESULTS

4.1. Results

The findings are presented in several stages, beginning with respondents' demographic profiles, descriptive statistics, factor analysis, and reliability assessment. The measurement model is then tested using PLS-SEM for reliability and validity, followed by the structural model assessment of collinearity, R^2, f^2, Q^2, and hypothesis testing, including direct and mediation effects using bootstrapping.

4.1.1 Respondent Demographics

Table 3 summarizes the demographic characteristics of the 280 respondents. Most were female and aged 18–20 years, with the largest proportions enrolled in the Faculties of Law and Business Administration. Motorcycles were the predominant mode of transportation, and most respondents reported great environmental concern. These characteristics provide a relevant context for examining EV purchase intention among young university students in Cambodia. Overall, the sample consisted mainly of young university students who predominantly relied on motorcycles and expressed environmental concern, providing a relevant context for examining EV purchase intention in Cambodia.

Table 3. Demographic characteristics of the respondents

Demographic	Description	Frequency	Percentage (%)
Gender	Female	209	74.6
	Male	71	25.4
Age	18–20 years	232	82.9
	21–23 years	42	15.0
	24–26 years	4	1.4
	27–29 years	2	0.7
Faculty	Faculty of Law	104	37.1

	Faculty of Business Administration	100	35.7
	Faculty of Finance and Banking	59	21.1
	Faculty of Information Technology	17	6.1
Primary mode of transportation	Motorcycle	243	86.8
	Car	9	3.2
	Public transportation	2	0.7
	Ride-hailing services	7	2.5
	Bicycle	10	3.6
	Walking	9	3.2
Environmental concern	Very important	156	55.7
	Important	88	31.4
	Neutral	31	11.1
	Not important	5	1.8

Source: Source: Processed data by researcher (2026)

4.1.2. Descriptive Statistics

Table 4 summarizes the descriptive statistics of the study constructs. The mean scores indicate generally neutral perceptions across SN, ATT, PBC, and EVPI, with PBC receiving the highest mean. The relatively similar standard deviations suggest comparable response variability across constructs. Skewness and kurtosis values also indicate no substantial departure from normality, supporting the suitability of the data for subsequent analysis.

Table 4. Results of descriptive statistics

Constructs	Minimum	Maximum	Mean	Standard Deviation	Level of Agreement	Skewness	Kurtosis
SN	1.00	5.00	3.123	0.977	Neutral	-0.141	-0.273
ATT	1.00	5.00	3.174	0.978	Neutral	-0.304	-0.187
PBC	1.00	5.00	3.256	1.064	Neutral	-0.235	-0.618
EVPI	1.00	5.00	3.248	1.055	Neutral	-0.314	-0.452

Source: Processed data by researcher (2026)

4.1.3. Factor Analysis

A preliminary factor analysis was conducted using an independent pilot sample ($n = 100$) to assess the underlying structure and refine the measurement items before the main PLS-SEM analysis. Principal Component Analysis with Varimax rotation was performed. The results generally supported the proposed four-construct structure, with KMO values above 0.60, eigenvalues above 1.00, cumulative variance exceeding 60%, and factor loadings meeting the predefined threshold of 0.60, except for SN4 (0.561). Therefore, SN4 was removed before the main survey to maintain consistency with the screening criteria and improve measurement quality. Although SN4 might have performed differently in the main PLS-SEM analysis, retaining it based on a potentially higher loading in a later sample would have contradicted the preliminary screening procedure. The remaining items met the specified criteria and were retained for subsequent analysis. The results are presented in Table 5.

Table 5. Results of the factor analysis

Constructs	Items	FL	KMO	E	Cu%
SN			0.803	2.633	65.835
	SN1	0.844			
	SN3	0.840			
	SN2	0.815			
	SN5	0.742			
	SN4	0.561			
ATT			0.833	3.222	64.442
	ATT1	0.871			
	ATT3	0.844			
	ATT2	0.776			
	ATT4	0.765			
	ATT5	0.751			
PBC			0.824	3.284	65.690
	PBC2	0.879			
	PBC4	0.866			
	PBC3	0.784			
	PBC5	0.777			
	PBC1	0.738			
EVPI			0.866	4.047	67.452
	EVPI1	0.865			
	EVPI6	0.862			
	EVPI3	0.844			
	EVPI4	0.799			
	EVPI2	0.786			
	EVPI5	0.767			

Source: Processed data by researcher (2026)

4.1.4. Reliability Analysis

Table 6 shows the internal consistency of the measurement constructs based on the pilot sample (n = 100). Cronbach's alpha values ranged from 0.826 to 0.903, exceeding the recommended threshold of 0.70, while AIIC values ranged from 0.543 to 0.608, within the recommended range of 0.30–0.70. These results indicate satisfactory internal consistency, supporting the retention of the measurement items for the subsequent PLS-SEM analysis.

Table 6. Reliability analysis of measurement items

Constructs	Items	Cronbach's α	Reliability Level	AIIC
SN	4	0.826	Good	0.543
ATT	5	0.861	Good	0.553
PBC	5	0.868	Good	0.568
EVPI	6	0.903	Excellent	0.608

Source: Processed data by researcher (2026)

4.1.5. Measurement Model Assessment

The measurement model was assessed for reliability, convergent validity, and discriminant validity. After item refinement, eleven items were retained across four constructs: SN (2 items), ATT (3 items), PBC (3 items), and EVPI (3 items). Outer loadings

ranged from 0.858 to 0.924, exceeding the recommended threshold of 0.70. Cronbach's alpha, rho_A, and CR values ranged from 0.812 to 0.893, 0.814 to 0.893, and 0.914 to 0.933, respectively, indicating satisfactory internal consistency. AVE values ranged from 0.797 to 0.841, exceeding the recommended threshold of 0.50 and supporting convergent validity. To improve discriminant validity, nine items were removed, including SN1 and SN2, ATT3 and ATT5, PBC3 and PBC5, and EVPI4, EVPI5, and EVPI6. Item removal was guided by cross-loadings, potential overlap between constructs, primary loading strength, and conceptual relevance, particularly regarding the distinction between SN and ATT and between EVPI and PBC. Following these adjustments, all HTMT values were below 0.90, supporting discriminant validity. Overall, eleven items were retained for the final measurement model, as presented in Table 7.

Table 7. Measurement model assessment

Constructs	Item	Outer Loadings	Cronbach's α	rho_A	CR	AVE
SN	SN3	0.923	0.812	0.814	0.914	0.841
	SN5	0.912				
ATT	ATT1	0.895	0.873	0.875	0.922	0.797
	ATT2	0.924				
	ATT4	0.858				
PBC	PBC1	0.909	0.883	0.884	0.928	0.811
	PBC2	0.901				
	PBC4	0.891				
EVPI	EVPI1	0.910	0.893	0.893	0.933	0.824
	EVPI2	0.908				
	EVPI3	0.904				

Source: Processed data by researcher (2026)

4.1.6 Discriminant Validity Assessment

Table 8 presents the Fornell–Larcker assessment of discriminant validity. The √AVE (0.893–0.917) exceeded the corresponding inter-construct correlations (0.697–0.798), indicating that each construct shares greater variance with its own indicators than with other constructs. Thus, the results provide evidence of adequate discriminant validity and support the distinctiveness of the constructs for subsequent structural analysis.

Table 8. Fornell–Larcker criterion and correlation matrix

Construct	SN	ATT	PBC	EVPI
SN	**0.893**			
ATT	0.786	**0.907**		
PBC	0.757	0.798	**0.901**	
EVPI	0.742	0.731	0.697	**0.917**

Source: Processed data by researcher (2026)

Note: Bold diagonal values indicate √AVE; off-diagonal values indicate correlations. $p < .01$ (two-tailed).

Additionally, Table 9 presents the HTMT ratios for assessing discriminant validity among the four constructs. The HTMT values ranged from 0.822 to 0.860, remaining below the recommended threshold of 0.90. These results indicate that the constructs are

empirically distinguishable, suggesting that each construct measures a conceptually distinct aspect of the proposed model.

Table 9. HTMT results

Construct	ATT	EVPI	PBC	SN
ATT	–			
EVPI	0.850	–		
PBC	0.860	0.848	–	
SN	0.832	0.857	0.822	–

Source: Processed data by researcher (2026)

4.1.7 Structural Model Assessment

Figure 2 presents the estimated structural model and the hypothesized relationships among SN, ATT, PBC, and EVPI, including the standardized path coefficients (β) and R^2 values. The structural model was assessed for collinearity, R^2, f^2, Q^2, and path significance using bootstrapping in SmartPLS. These assessments provide evidence of the model's explanatory and predictive performance and the significance of the hypothesized relationships.

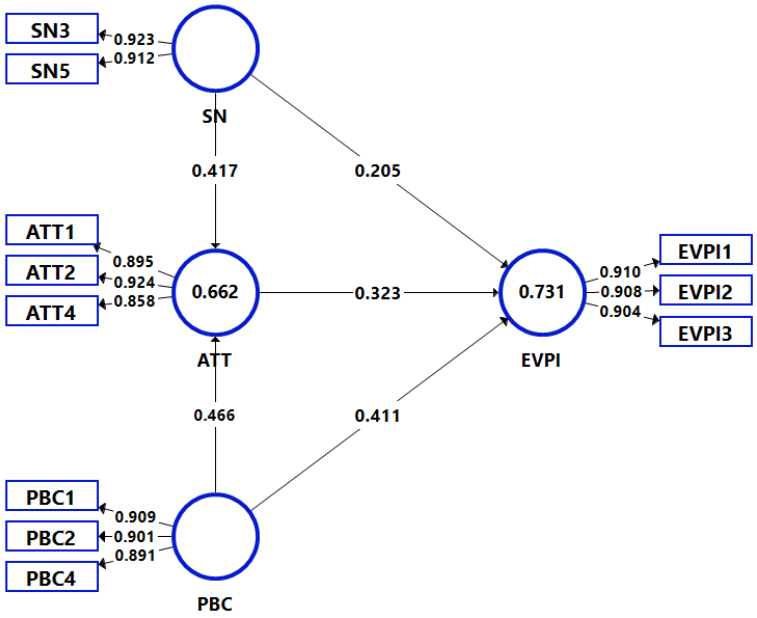


Figure 2. Structural model estimated using the PLS algorithm

Source: Processed data by researcher (2026)

4.1.8. Collinearity Assessment

Collinearity was assessed using inner VIF values. All values were below the recommended threshold of 5.00, indicating no critical collinearity concerns among the predictor constructs in the structural model, as shown in Table 10. These results suggest that multicollinearity is unlikely to substantially distort the estimated path coefficients. Therefore, the structural model demonstrates acceptable collinearity levels for evaluating the hypothesized relationships.

Table 10. Inner VIF values for structural collinearity assessment

Predictor Constructs	Endogenous Construct	VIF
SN	EVPI	2.458
ATT	EVPI	2.957
PBC	EVPI	2.586
SN	ATT	1.944
PBC	ATT	1.944

Source: Processed data by researcher (2026)

4.1.9. Structural Model Quality Assessment

Table 11 presents the structural model's explanatory power, predictive relevance, and effect sizes. The model demonstrated strong explanatory power, with SN, PBC, and ATT collectively explaining for 73.1% of the variance in EVPI (R^2 = 0.731), while SN and PBC jointly accounted for 66.2% of the variance in ATT (R^2 = 0.662). The positive Q^2 values indicate predictive relevance. Regarding effect sizes, PBC made the largest contribution to explaining EVPI, while SN made the largest contribution to explaining ATT. Overall, these findings suggest that the model has strong explanatory power, with PBC playing an important role in explaining EVPI.

Table 11. Structural model quality assessment

Endogenous Constructs	R^2	Adjusted R^2	Q^2	Exogenous	f^2	Effect Size
EVPI	0.731	0.728	0.598	SN	0.064	Small
				ATT	0.131	Small
				PBC	0.243	Medium
ATT	0.662	0.659	0.523	SN	0.264	Medium
				PBC	0.330	Medium

Source: Processed data by researcher (2026)

4.1.10. Hypothesis Testing of Direct Effect

Table 12 shows the hypothesis testing results. All five hypothesized relationships were statistically significant and positive, with p-values below 0.05 and 95% BCa confidence intervals that did not include zero. Therefore, H1–H5 were all supported. These findings indicate that SN, ATT, and PBC were positively associated with EVPI, while SN and PBC were also positively associated with ATT. Overall, the results provide empirical support for all hypothesized relationships in the proposed model.

Table 12. Results of direct hypothesis testing

Hypothesis	Structural Relationship	β	t-value	p-value	95% BCa CI	Results
H1	SN → EVPI	0.205	3.422	0.001	[0.091, 0.322]	Supported
H2	ATT → EVPI	0.323	4.639	< 0.001	[0.192, 0.464]	Supported
H3	PBC → EVPI	0.411	6.224	< 0.001	[0.283, 0.539]	Supported
H4	SN → ATT	0.417	6.084	< 0.001	[0.286, 0.553]	Supported
H5	PBC → ATT	0.466	6.574	< 0.001	[0.322, 0.600]	Supported

Source: Processed data by researcher (2026)

Note: * = p < 0.05; ** = p < 0.01; *** = p < 0.001; β = standardized path coefficient; CI = bias-corrected 95% confidence interval

4.1.11. Hypothesis Testing of Mediating Effect

Table 13 presents the mediation analysis examining the role of ATT in the relationships between SN, PBC, and EVPI. Both indirect effects were statistically significant, with the 95% BCa confidence intervals excluding zero, indicating significant indirect associations between SN and EVPI and between PBC and EVPI through ATT. Because the corresponding direct effects also remained significant, ATT demonstrated partial statistical mediation in both relationships. Therefore, H6 and H7 were supported, suggesting that SN and PBC were associated with EVPI both directly and indirectly through ATT.

Table 13. Results of indirect effect (mediation) analysis

Hypothesis	Indirect Relationship	β	t-value	p-value	95% BCa CI	Mediation Type	Results
H6	SN → ATT → EVPI	0.135	3.329	0.001	[0.067, 0.225]	Partial mediation	Supported
H7	PBC → ATT → EVPI	0.150	3.753	< 0.001	[0.080, 0.238]	Partial mediation	Supported

Source: Processed data by researcher (2026)

5. DISCUSSION

5.1. Subjective Norm and Electric Vehicle Purchase Intention

H1 was supported because subjective norm was significantly and positively associated with electric vehicle purchase intention (β = 0.205, p = 0.001). Students who perceived greater social support or approval from important people in their lives tended to report stronger intentions to purchase EVs. This finding aligns with the TPB and previous EV studies showing that social expectations are associated with purchase intention (Ji et al., 2024; Habbe et al., 2025). This relationship may reflect the importance of family, friends, and other reference groups in shaping decisions about unfamiliar and expensive technologies. Similarly, Indonesian EV research suggests that social influence may also shape purchase intention, although its relevance may vary with differences in purchasing power, charging infrastructure, government incentives, and transportation needs. In Cambodia, family and peer opinions may be relevant when young adults consider EV ownership. However, social encouragement may not be sufficient when financial and practical barriers remain. The relatively weak association observed in this study suggests that social influence may complement, rather than replace, considerations of affordability and ownership feasibility.

5.2. Attitude and Electric Vehicle Purchase Intention

H2 was supported because attitude was significantly and positively associated with EVPI (β = 0.323, p < 0.001). Students with more favorable evaluations of EV ownership tended to report stronger purchase intentions. This finding is consistent with previous EV studies showing that favorable attitudes are associated with stronger purchase intentions (Mohd Noor et al., 2025; Purwanto et al., 2025). This relationship may arise because consumers who perceive EVs as beneficial, desirable, and suitable for their needs are more willing to consider purchasing them. Likewise, Indonesian EV studies suggest that favorable

attitudes toward EV ownership are positively associated with purchase intention, although the strength of this relationship may vary with consumers' financial circumstances and perceptions of practical ownership barriers. In Cambodia, students recognize the environmental benefits and potential long-term savings of EVs. Nevertheless, favorable attitudes may not always translate into purchase intention when vehicle prices, charging access, and maintenance remain concerns. The moderate association found in this study suggests that positive evaluations matter, but perceived feasibility may be more closely associated with EV purchase intention among Cambodian Gen Z university students.

5.3. Perceived Behavioural Control and Electric Vehicle Purchase Intention

H3 was supported because perceived behavioural control was significantly and positively associated with EVPI ($\beta = 0.441$, $p < 0.001$). Students who perceived EV ownership as more manageable tended to report stronger purchase intentions. This finding aligns with previous studies identifying PBC as an important correlate of EV purchase intention (Buhmann et al., 2024; Pamidimukkala et al., 2024). This relationship may reflect the importance of perceived affordability, financial resources, charging access, and the practical requirements of EV ownership when consumers consider purchasing an EV. In Cambodia, these considerations are particularly relevant to university students, who may have limited independent purchasing power and depend on family financial support. The strongest direct association observed in this study highlights the importance of perceived ownership feasibility when understanding EV purchase intention among Cambodian Gen Z university students.

5.4. Subjective Norm and Attitude

H4 was supported because subjective norm was significantly and positively associated with attitude toward electric vehicle (EV) purchase ($\beta = 0.417$, $p < .001$). Students who perceived greater social support or approval from important people in their lives tended to hold more favorable attitudes toward EV ownership. This finding aligns with the TPB and previous research suggesting that social expectations can shape attitudes toward technology adoption and pro-environmental behavior (Kim et al., 2021; Yasa et al., 2022). Family members, friends, and other reference groups may influence how young people evaluate the desirability and social acceptability of EVs. In Cambodia, where EV adoption is still developing, positive opinions from trusted people may help students view EV ownership more favorably. However, favorable social expectations do not necessarily mean that students can afford or practically access EVs. Therefore, social encouragement may contribute to positive attitudes, while actual purchase decisions may also depend on financial resources and the practical feasibility of EV ownership.

5.5. Perceived Behavioural Control and Attitude

H5 was supported because perceived behavioural control (PBC) was significantly and positively associated with attitude toward EV purchase ($\beta = 0.466$, $p < .001$). Students

who perceived EV ownership as more affordable, accessible, and manageable tended to evaluate it more favorably. This finding is consistent with the TPB and previous studies reporting positive relationships between PBC and attitudes toward technology adoption and sustainable behavior (Yasa et al., 2022; Buhmann et al., 2024). This relationship reflects the importance of perceived resources and practical feasibility when evaluating EV ownership. In Cambodia, students who believe they can manage the financial and practical requirements of owning an EV may be more likely to view EVs positively. Conversely, concerns about purchase costs, charging access, and the availability of suitable infrastructure may weaken favorable evaluations. The stronger association of PBC with attitude compared with the relationship between SN and attitude suggests that perceived feasibility is particularly relevant to students' evaluations of EV ownership. However, this finding concerns perceived control rather than actual affordability or access, which may differ from students' perceptions.

5.6. Mediating Role of Attitude in the Relationship Between Subjective Norm and Electric Vehicle Purchase Intention

H6 was supported because attitude significantly mediated the association between subjective norm and EVPI ($\beta = 0.135$, $p = 0.001$). Students' perceived social expectations were associated with purchase intention both directly and indirectly through attitude, indicating partial statistical mediation. This finding aligns with previous research identifying attitude as a mediator between subjective norm and behavioural intention (Gundala et al., 2022). Social encouragement from family and friends may be associated with more favorable evaluations of EV ownership, which are subsequently associated with stronger purchase intentions. In Cambodia, where students may consult family members and peers when considering expensive purchases, social approval may be relevant to both their evaluations and intentions. The significant indirect association suggests that the relationship between social expectations and purchase intention extends beyond a direct association. However, because the study used cross-sectional data, the findings establish statistical mediation rather than a confirmed causal process.

5.7. Mediating Role of Attitude in the Relationship Between Perceived Behavioural Control and Electric Vehicle Purchase Intention

H7 was supported because attitude significantly mediated the association between perceived behavioural control and EVPI ($\beta = 0.150$, $p < 0.001$). Students' perceptions of their ability to own an EV were associated with purchase intention both directly and indirectly through attitude, indicating partial statistical mediation. This finding aligns with previous research supporting the mediating role of attitude in the relationship between PBC and EV purchase intention (Yasa et al., 2022). Students who perceive EV ownership as financially and practically manageable may evaluate it more favorably, which may be associated with stronger purchase intentions. In Cambodia, perceived ownership feasibility may be especially important because students may face financial constraints and uncertainty about charging and maintenance arrangements. The significant indirect

association highlights the relevance of both perceived feasibility and personal evaluation when understanding EV purchase intention. Nevertheless, the stronger direct association of PBC with EVPI suggests that perceived feasibility remains important beyond its indirect association through attitude.

6. CONCLUSION

This study provides empirical evidence on the determinants of electric vehicle (EV) purchase intention among Cambodian Generation Z university students through an extended Theory of Planned Behavior (TPB) framework. The findings demonstrate that perceived behavioural control, attitude, and subjective norm are positively associated with purchase intention, with perceived behavioural control exhibiting the strongest direct relationship. Attitude also partially mediates the associations of subjective norm and perceived behavioural control with purchase intention, indicating that perceived ownership feasibility, personal evaluations, and social expectations are interconnected in explaining consumer intentions. By incorporating attitude as a mediator, this study extends the application of TPB to sustainable consumer behaviour in Cambodia's emerging EV market. The findings highlight the importance of considering perceived affordability and practical ownership conditions alongside social influence when examining prospective EV demand.

From a business and policy perspective, the findings suggest that EV market development strategies should address perceived ownership barriers while strengthening consumer awareness and favourable attitudes. Improving access to charging facilities, communicating ownership costs, and providing accessible information on EV benefits may support consumer engagement, although the effectiveness of these interventions was not directly tested. The findings should be interpreted cautiously because the study employed cross-sectional data and convenience sampling from a single university, limiting causal inference and generalisability. Moreover, purchase intention does not necessarily translate into actual purchasing behaviour. Future research should employ longitudinal and multi-institutional designs, incorporate actual adoption measures, and examine affordability, infrastructure accessibility, and policy incentives to better understand EV market development in Cambodia and comparable emerging economies.

Author Contributions

C. C.: Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Validation, Resources, Conceptualization, Supervision, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing.

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