

Exploring the Determinants of Academic Success among Working Undergraduate Students in Cambodia

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ABSTRACT

Managing work and study responsibilities simultaneously can create substantial challenges for university students; however, evidence on academic resilience and success among working undergraduates in Cambodia remains limited. This study addresses this gap by developing and testing a structural equation model examining the effects of self-directed learning, self-efficacy, and peer support on academic resilience and academic success. A quantitative correlational design was employed with 385 working undergraduate students from four faculties at BELTEI International University, Cambodia. Data were analyzed using SPSS and AMOS. The findings indicate that self-directed learning ($\beta = .131, p = .008$), self-efficacy ($\beta = .763, p < .001$), and peer support ($\beta = .340, p < .001$) significantly predict academic resilience, with self-efficacy showing the strongest effect. Additionally, these factors also significantly predict academic success: self-directed learning ($\beta = .174, p < .001$), self-efficacy ($\beta = .340, p = .009$), and peer support ($\beta = .167, p = .008$), while academic resilience has the strongest effect ($\beta = .493, p < .001$). The model explains 72% of the variance in academic resilience and 75% in academic success, indicating substantial explanatory power. The findings underscore the importance of strengthening self-efficacy, self-directed learning, peer support, and academic resilience to help working students manage competing work and study demands. Universities should provide supportive learning environments, mentoring, peer support, and flexible learning arrangements. Future research should validate the model across diverse samples and institutional contexts.

INTRODUCTION

Academic advancement in higher education involves more than simply achieving conventional academic milestones; it also requires students to cultivate independence in handling various responsibilities (Lei et al., 2020). When students pursue their studies while engaging in part-time or full-time employment, they assume an additional and often demanding responsibility for managing their work-related commitments (Lei et al., 2020). As a result, individuals who simultaneously fulfill the roles of employee and student may encounter considerable demands on their time, energy, and overall ability to function effectively (Orbilla & Paglinawan, 2025). For instance, previous research has indicated that many students undertake both employment and academic study concurrently throughout their

educational journey, engaging in either part-time or full-time work (El Dine & Kaoud, 2023; Pološki Vokić et al., 2021).

In the United States, a substantial proportion of university students combine higher education with employment, with 81% of part-time students and 43% of full-time students reported as employed in 2017 (El Dine & Kaoud, 2023). Similarly, the EUROSTUDENT project found that 69% of students across the European Higher Education Area engage in paid work, although the proportion varies across countries (Pološki Vokić et al., 2021). These findings demonstrate that combining work and study is a common feature of higher education. However, balancing both roles can create opportunities as well as challenges for students, particularly in managing academic demands alongside employment responsibilities (Orbilla & Paglinawan, 2025). For instance, working while studying can provide students with valuable benefits, such as professional growth, wider social connections, stronger workplace relationships, and opportunities to apply academic knowledge in practice (Remenick & Bergman, 2020). However, balancing both roles can also result in fatigue, academic difficulties, demanding responsibilities, and poor time management (Orbilla & Paglinawan, 2025). Financial needs, personal goals, and family obligations may further motivate students to work while studying, underscoring the importance of understanding how they balance these competing demands (Orbilla & Paglinawan, 2025).

These opportunities and challenges highlight the importance of understanding how working students manage their dual responsibilities and overcome the difficulties associated with balancing work and study. Therefore, prior studies suggest that self-directed learning, self-efficacy, and peer support are effective factors that can help working undergraduate students manage academic demands and achieve better academic outcomes (Afandi et al., 2022; Lase & Wibowo, 2024; Nguyen et al., 2021). Self-efficacy strengthens their confidence and resilience in managing academic tasks (Afandi et al., 2022), while self-directed learning enables students to gain knowledge, regulation, and responsibility for their learning (Nguyen et al., 2021), and peer support provides valuable academic and emotional assistance (Lase & Wibowo, 2024).

These resources may also strengthen students' academic resilience, enabling them to adapt to difficulties and persist in their studies despite work-related and academic pressures. Although previous studies have examined factors associated with academic success, research has often focused on individual predictors, providing a limited understanding of how self-directed learning, self-efficacy, and peer support collectively influence academic resilience and academic success. Moreover, limited research has integrated these behavioral, psychological, and social factors within a cohesive structural equation modeling (SEM) model, particularly in developing higher education contexts. This gap is especially relevant to working undergraduate students, who must simultaneously manage academic and employment responsibilities.

Therefore, this study develops an integrated SEM model to examine the effects of self-directed learning, self-efficacy, and peer support on academic resilience and academic outcomes, as well as the effect of academic resilience on academic performance among working undergraduate students in Cambodia. The study contributes to the literature by extending evidence on working undergraduate students in Cambodia's developing higher education context and examining the interrelationships among behavioral, psychological, social, and resilience-related factors. Practically, the findings may inform universities and policymakers in designing targeted support programs and policies to strengthen working students' academic resilience and academic success.

LITERATURE REVIEW

Working undergraduate students

Working undergraduate students have become an increasingly important population in higher education, as many undergraduates combine academic study with part-time or full-time employment to meet financial needs, support their families, gain professional experience, and improve future career opportunities (Remenick & Bergman, 2020; El Dine & Kaoud, 2023). Although employment can provide valuable financial and professional benefits, combining work and study may create competing demands on students' time, energy, and attention (Chinyakata et al., 2019; Griffin, 2022). Consequently, working undergraduate students often need to manage multiple responsibilities while maintaining their

academic commitments. For instance, prior studies have identified various academic and personal challenges among working students, including stress, fatigue, limited study time, reduced concentration, difficulties with time management, and lower academic engagement and performance (Bartolj & Polanec, 2021; Thies, 2022; Lessky & Unger, 2023; Kocsis & Pusztai, 2024; Tecson et al., 2025).

These challenges may make it difficult for working students to maintain consistent academic progress while fulfilling employment responsibilities (Bartolj & Polanec, 2021; Thies, 2022; Lessky & Unger, 2023; Kocsis & Pusztai, 2024; Tecson et al., 2025). Therefore, academic success among working students may depend not only on their ability to manage competing demands but also on the personal and social resources available to support their learning and adaptation. In this context, self-directed learning has been examined in countries such as Turkey, Vietnam, and Saudi Arabia (Tomak & Seferoğlu, 2021; Nguyen et al., 2021; Algouzi et al., 2023), while self-efficacy has received attention in Poland, the United Kingdom, Yemen, and China (Konaszewski et al., 2021; Griffiths et al., 2021; Al-Qadri et al., 2024; Meng & Zhang, 2023). Peer support has also been highlighted across Indonesia, the United Kingdom, Bangladesh, and Germany (Lase & Wibowo, 2024; Binasari & Tentama, 2025; Smith et al., 2024; Paik, 2024).

These factors may provide important personal, academic, and social resources that help working undergraduate students manage academic demands (Algouzi et al., 2023). Self-directed learning supports students' responsibility for their learning, self-efficacy strengthens confidence in completing academic tasks (Griffiths et al., 2021), and peer support provides encouragement and academic assistance (Schimmelpfennig, 2025). Furthermore, academic resilience may help students adapt to difficulties and maintain academic success while balancing work and study. In Cambodia, empirical research on working undergraduate students remains limited, with existing studies primarily focusing on the challenges and experiences of combining employment with higher education (Moeurn et al., 2024). Although Lan et al. (2024) proposed a conceptual framework of factors influencing academic adjustment, the framework has yet to be empirically tested, leaving an important gap in the Cambodian higher education literature.

Limited evidence exists on how behavioral, psychological, and social factors are associated with academic resilience and academic success. Therefore, this study develops an integrated SEM model examining the effects of self-directed learning, self-efficacy, and peer support on academic resilience and academic success, as well as the effect of academic resilience on academic performance among working undergraduate students in Cambodia. The study contributes by extending evidence in Cambodia's developing higher education context and integrating behavioral, psychological, social, and resilience-related factors within a unified framework. Overall, the findings may guide universities and policymakers in formulating targeted interventions and institutional policies that foster working students' academic resilience and academic success.

Theoretical Background of the Study

This study is grounded in two complementary perspectives: Social Cognitive Theory (SCT) (Bandura, 1986) and Social Support Theory (SST) (Cohen & Wills, 1985). SCT emphasizes the association among personal factors, behaviors, and environmental influences, providing a basis for the behavioral and psychological dimensions of this study (Bandura, 1986). Self-directed learning represents a behavioral factor reflecting students' active management of learning, while self-efficacy represents a psychological factor reflecting confidence in performing academic tasks and overcoming difficulties (Bandura, 1986). These resources may strengthen students' academic resilience in adapting to academic challenges.

Meanwhile, SST emphasizes interpersonal resources that help individuals cope with requirements (Cohen & Wills, 1985), positioning peer support as the social dimension through academic assistance and encouragement. Academic resilience represents the resilience-related dimension, enabling working students to adapt to difficulties and persist academically (Martin & Marsh, 2006). Overall, SCT and SST collectively provide an integrated foundation for examining how behavioral, psychological, social, and resilience-related factors contribute to academic success among working undergraduate students in Cambodia.

Hypothesis Development

Self-directed Learning and Academic Resilience

Self-directed learning involves students taking responsibility for planning, managing, and evaluating their own learning (Dahal & Bhat, 2023). By promoting autonomy, discipline, and active learning, it may strengthen students' capacity to manage academic demands and respond effectively to challenges (Rogan et al., 2021). These self-management capabilities can foster adaptability, persistence, and responsibility when students encounter academic difficulties, thereby supporting academic resilience (Rogan et al., 2024). Empirical evidence further suggests that self-directed learning is positively associated with students' ability to adapt and persist in challenging learning environments (Nguyen et al., 2021; Algouzi et al., 2023).

H1: Self-directed learning has a significant positive effect on academic resilience among working undergraduate students in Cambodia.

Self-efficacy and Academic Resilience

Self-efficacy refers to individuals' beliefs in their ability to perform tasks and achieve desired goals (Bandura, 1986). It influences students' motivation, effort, persistence, and responses to academic challenges (Greco et al., 2022). Students with stronger self-efficacy are more likely to adopt task-oriented strategies, persist through difficulties, and maintain confidence when facing academic demands (Konaszewski et al., 2021; Griffiths et al., 2021). These characteristics may strengthen students' capacity to adapt to academic adversity and sustain their academic engagement, thereby supporting academic resilience (Konaszewski et al., 2021; Griffiths et al., 2021). Based on this, the following hypothesis is proposed.

H2: Self-efficacy has a significant positive effect on academic resilience among working undergraduate students in Cambodia.

Peer Support and Academic Resilience

Peer support provides students with encouragement, assistance, and emotional support when facing academic challenges (Lase & Wibowo, 2024). Strong peer support can help students cope with difficulties, maintain motivation, and adapt to demanding academic situations (Lase & Wibowo, 2024). Previous studies found that peer social support significantly contributes to and is positively related to academic resilience among students (Rustham et al., 2022; Gunawan & Huwae, 2022). Based on these findings, the following hypothesis is proposed.

H3: Peer support has a significant positive effect on academic resilience among working undergraduate students in Cambodia.

Self-directed Learning and Academic Success

Self-directed learning enables students to take responsibility for their learning, regulate their study activities, and pursue academic goals independently (Dahal & Bhat, 2023). These behaviors can enhance students' engagement and effectiveness in learning, thereby improving academic success (Dahal & Bhat, 2023). Previous research found a positive relationship between self-directed learning and academic success among college students (Li et al., 2022; Kanyopa & Makgalwa, 2024). Based on this evidence, the following hypothesis is proposed.

H4: Self-directed Learning has a significant positive effect on academic success among working undergraduate students in Cambodia.

Self-efficacy and Academic Success

Self-efficacy influences students' confidence in managing academic tasks, sustaining effort, and achieving desired outcomes (Alabyadh et al., 2022). Students with stronger self-efficacy are more likely to approach academic tasks confidently and persist when facing difficulties, which may contribute to better academic success (Alabyadh et al., 2022). Prior studies have confirmed a positive relationship between self-efficacy and academic success among university students (Macakova & Wood, 2022; Figueiredo et al., 2024). Based on these findings, the following hypothesis is proposed.

H5: Self-efficacy has a significant positive effect on academic success among working undergraduate students in Cambodia.

Peer Support and Academic Success

Peer support refers to the social encouragement, motivation, and assistance students receive from their peers during the learning process (Lase & Wibowo, 2024). Students who receive greater peer support are more likely to demonstrate stronger learning engagement, achievement goals, emotional regulation, and positive learning behaviors, which can contribute to better academic success (Nasir et al., 2025). Previous studies have found a significant positive relationship between peer support and academic success among students (Nasir et al., 2025; Gai et al., 2026). Therefore, peer support may be particularly important for working undergraduate students who need to manage both academic and work-related demands. Based on this, the following hypothesis is proposed.

H6: Peer support has a significant positive effect on academic success among working undergraduate students in Cambodia.

Academic Resilience and Academic Success

Academic resilience refers to students' ability to persist, adapt, and respond effectively to academic challenges and setbacks (Ye et al. 2021). Students with stronger academic resilience are more likely to maintain effort and engagement despite academic difficulties, which can support better academic outcomes (Fru-Ngongban, 2023). Previous studies have found a significant positive relationship between academic resilience and academic success among university students (Cai & Meng, 2025; Almulla, 2024). Therefore, academic resilience may be particularly important for working undergraduate students who face both academic and work-related demands. Based on this, the following hypothesis is proposed.

H7: Academic resilience has a significant positive effect on academic success among working undergraduate students in Cambodia.

Therefore, based on the theoretical perspectives and empirical evidence discussed above, this study proposes that self-directed learning, self-efficacy, and peer support influence academic resilience and academic success, while academic resilience is expected to contribute to academic performance among working undergraduate students in Cambodia. The proposed relationships among the study variables are presented in Figure 1.

Conceptual Framework

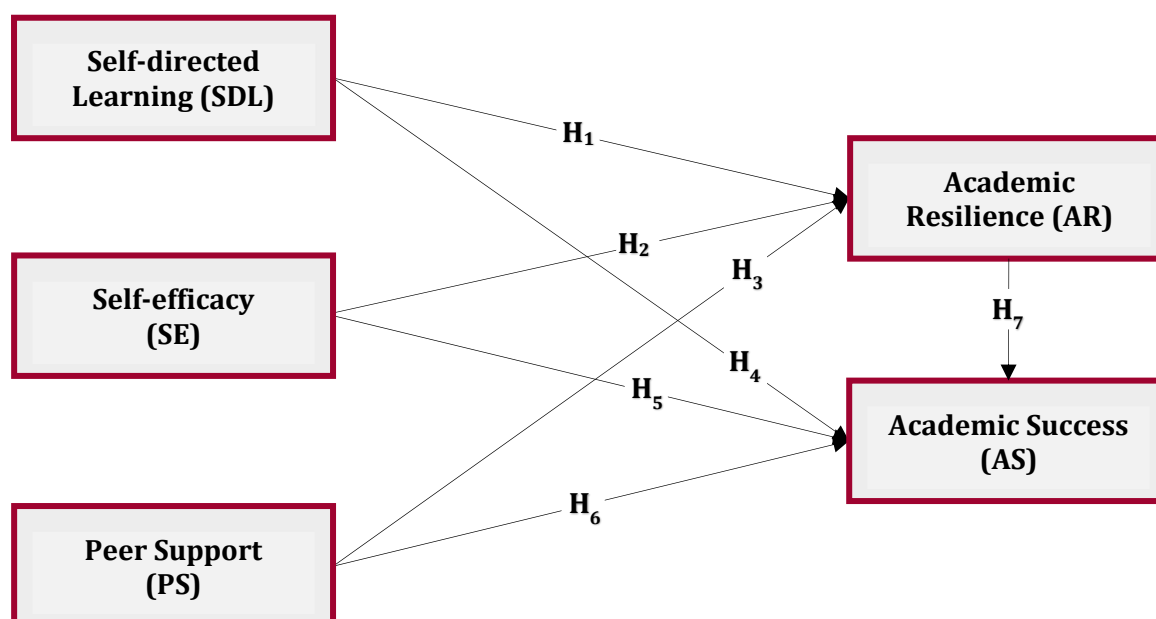


Figure 1. Conceptual Framework
Source. Proposed by Researcher (2026)

METHODS

Research Design

This study employed a quantitative correlational research design to examine the relationships among self-directed learning, self-efficacy, peer support, academic resilience, and academic success among working undergraduate students in Cambodia. The quantitative approach enabled systematic measurement and statistical testing of the proposed relationships, while the correlational design examined associations among the study variables without manipulation. Data were collected through a structured questionnaire administered to undergraduate students who were simultaneously working and studying. This design was appropriate for addressing the research objectives and testing the proposed hypotheses.

Sample and Sampling Methods

As the population size was unknown, the sample size was estimated using Cochran's formula: $n = z^2 / 4(e)^2$ (Cochran, 1977). Using a 95% confidence level ($z = 1.96$) and a margin of error of 0.05, the calculation yielded a minimum sample size of 385 working undergraduate students (Uakarn et al., 2021). However, because convenience sampling was employed, the confidence level and margin of error are not interpreted as indicators of sampling precision or population representativeness. A total of 385 working undergraduate students were recruited through convenience sampling (Scholtz, 2021) from four faculties at BELTEI International University, Chom Chao Flyover Campus (Campus 2), Phnom Penh, Cambodia, including the Faculty of Business Administration, Faculty of Finance and Banking, Faculty of Law, and Faculty of Information Technology. The sample size was considered adequate for covariance-based structural equation modeling (CB-SEM) using AMOS, given the number of observed variables and structural relationships specified in the proposed model. The final sample of 385 cases provided sufficient observations for estimating both the measurement and structural models. Nevertheless, the use of nonprobability sampling may limit the representativeness of the sample and the generalizability of the findings beyond the study context.

Research Instruments

According to Table 1, the structured questionnaire included respondents' demographic profiles and main constructs adapted from existing literature. Items were modified to fit the local context and research objectives while maintaining clarity, reliability, and validity. The questionnaire was translated into Khmer and back-translated into English by two bilingual colleagues, with minor revisions made after pilot testing. A bilingual (Khmer-English) version was used for data collection. Responses were measured using a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), with mean scores interpreted as 1.00–1.80 = strongly disagree, 1.81–2.60 = disagree, 2.61–3.40 = neutral, 3.41–4.20 = agree, and 4.21–5.00 = strongly agree (Joshi et al., 2015).

Table 1. Summary of the construct measurement

Description of Items	Number of Items	Sources
Self-directed Learning	SDL1→SDL5	Nguyen and Bui (2023); Zhao and Lertlit (2023)
Self-efficacy	SE1→SE4	Greco et al. (2022)
Peer Support	PS1→PS4	Parmar et al. (2025); Binasari and Tentama (2025)
Academic Resilience	AR1→AR4	Gabryś et al. (2025); Cai & Meng (2025)
Academic Success	AS1→AS4	Tran et al. (2026), Pérez-Jorge et al. (2025)

Data Collection Procedures

Data were collected in two sequential stages from working undergraduate students across four faculties. In the first stage, a pilot study involving 95 fourth-year undergraduate students was conducted on June 20, 2025, to assess item clarity and explore the preliminary factor structure through exploratory factor analysis (EFA). Given the relatively small sample size, this stage was intended primarily for item refinement rather than definitive construct validation. In the second stage, the main survey was conducted from June 25 to July 27, 2026. A total of 438 working undergraduate students were invited to participate, and 416 responses were received, yielding a response rate of 94.98%. The questionnaire

was distributed through Google Forms using electronic platforms, including Telegram. Following data screening, 31 responses were excluded due to inattentive or low-quality response patterns, such as selecting the same response option across questionnaire items. Consequently, 385 valid responses were retained for the final analysis. Participation was voluntary, informed consent was obtained from all respondents, and confidentiality was assured. The final dataset was used to assess the hypothesized relationships among the study variables using regression analysis.

Data Analysis Method

Data were analyzed using Microsoft Excel 2019, IBM SPSS Statistics 27, and AMOS 23. Microsoft Excel was used for data coding, screening, and cleaning, while SPSS was used to conduct descriptive statistics, reliability analysis, and EFA. EFA was conducted using principal component analysis with varimax rotation as a preliminary assessment of the factor structure and to refine the measurement scales (Hair et al., 2014). The suitability of the data for factor analysis was assessed using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett’s test of sphericity. A KMO value of $\geq .60$ and a statistically significant Bartlett’s test ($p < .05$) were considered acceptable (Hutcheson & Sofroniou, 1999). Factors were retained based on eigenvalues greater than 1, factor loadings of $\geq .60$, cross-loadings below .40, and cumulative variance explained exceeding 60% (Hair et al., 2014).

Reliability was assessed using Cronbach’s alpha ($\alpha \geq .60$) and average inter-item correlation (AIIC) between .30 and .70. A pilot sample of at least 55 respondents was considered adequate for preliminary assessment of construct reliability and item clarity (Hair et al., 2014; Bujang et al., 2024; Gharaibeh et al., 2017). Following the EFA and reliability assessment, CFA and SEM were conducted in AMOS 23 using maximum likelihood ML estimation to assess the measurement and structural models and evaluate the hypothesized relationships. Model fit was evaluated using multiple goodness-of-fit indices, including χ^2/df (CMIN/DF), RMSEA, NFI, CFI, GFI, AGFI, TLI, IFI, and RFI, following established guidelines (Hair et al., 2014), as presented in Table 2. Modification indices were examined, and model modifications were implemented only when theoretically justified and consistent with the conceptual framework of the study.

Table 2. Measurement model fit indices

Model Fit Indices	Acceptable Fit	Good Fit
Chi-square divided by degrees of freedom (χ^2/df)	$2 < \chi^2 \leq 3$	$0 \leq \chi^2/\text{df} \leq 2$
Root Mean Square Error of Approximation (RMSEA)	$.05 < \text{RMSEA} \leq .08$	$0 \leq \text{RMSEA} \leq .05$
Normed Fit Index (NFI)	$.90 \leq \text{NFI} < .95$	$.95 \leq \text{NFI} \leq 1.00$
Comparative Fit Index (CFI)	$.95 \leq \text{CFI} < .97$	$.97 \leq \text{CFI} \leq 1.00$
Goodness -of-Fit Index (GFI)	$.90 \leq \text{GFI} < .95$	$.95 \leq \text{GFI} \leq 1.00$
Adjusted Goodness-of-Fit Index (AGFI)	$.85 \leq \text{AGFI} < .90$	$.90 \leq \text{AGFI} \leq 1.00$
Tucker-Lewis Index (TLI)	$.90 \leq \text{TLI} < .95$	$.95 \leq \text{TLI} \leq 1.00$
Incremental Fit Index (IFI)	$.90 \leq \text{RFI} < .95$	$.95 \leq \text{RFI} \leq 1.00$
Relative Fit Index (RFI)	$.90 \leq \text{IFI} < .95$	$.95 \leq \text{IFI} \leq 1.00$

Convergent validity was assessed using average variance extracted (AVE) and composite reliability (CR), with recommended thresholds of $\geq .50$ and $\geq .70$, respectively (Henseler et al., 2015), computed as:

$$\text{AVE} = \frac{\sum_{i=1}^n \lambda_i^2}{n} \quad \text{CR} = \frac{(\sum_{i=1}^n \lambda_i)^2}{(\sum_{i=1}^n \lambda_i)^2 + (\sum_{i=1}^n \delta_i)}$$

Standardized loadings above .60, with t-values > 1.96 and $p < .001$, were also considered acceptable (Hair et al., 2014). Discriminant validity was assessed via the Fornell–Larcker criterion, confirmed when a construct’s $\sqrt{\text{AVE}}$ exceeded its correlations with other constructs (Fornell & Larcker, 1981). Pearson’s correlation analysis was used to assess the direction and strength of associations among the constructs (Krehbiel, 2004). Common method bias (CMB) was first assessed using Harman’s single-factor test, with

a variance exceeding 50% indicating potential CMB, followed by the common latent factor approach, where a difference of less than .20 in standardized loadings between CFA models with and without the CLF indicated that CMB was unlikely to be a serious concern (Afthanorhan et al., 2021; Podsakoff et al., 2003). Finally, SEM was used to simultaneously estimate the hypothesized relationships, with findings presented using standardized path coefficients.

RESULTS AND DISCUSSION

Respondent Demographics

Table 3 presents the demographic characteristics of the 385 working undergraduate students. Respondents were predominantly female and aged 18–23 years. The largest proportion came from the Faculty of Business Administration, followed by Information and Technology. Most students reported high or very high time pressure and responsibility levels, indicating substantial challenges in balancing work and academic commitments.

Table 3. Demographic characteristics of the respondents

Demographic	Description	Frequency	Percentage (%)
Gender	Female	266	69.1
	Male	119	30.9
Age	18–20 years old	227	59.0
	21–23 years old	142	36.9
	24–26 years old	11	2.9
	Above 26 years old	5	1.3
Major	Faculty of Business Administration	172	44.7
	Faculty of Information and Technology	109	28.3
	Faculty of Law	53	13.8
	Faculty of Finance and Banking	51	13.2
Time pressure	Very High	112	29.1
	High	175	45.5
	Moderate	94	24.4
	Low	4	1.0
Level of Responsibility	Very high responsibility	238	61.8
	High responsibility	141	36.6
	Moderate responsibility	6	1.6

Descriptive Statistics

Table 4 presents the descriptive statistics for the five constructs. Scores ranged from 1.00 to 5.00, indicating use of the full five-point Likert scale. Mean scores ranged from 3.727 to 3.960, indicating overall agreement with the statements. Based on the scale, means between 3.41 and 4.20 represent “Agree.” Self-Directed Learning had the highest mean ($M = 3.960$, $SD = .723$), while Self-Efficacy had the lowest ($M = 3.727$, $SD = .709$), with all constructs remaining within the “Agree” range.

Table 4. Results of descriptive statistics

Constructs	Min.	Max.	M	SD	LA
Self-directed Learning	1.00	5.00	3.960	.723	Agree
Self-efficacy	1.00	5.00	3.727	.709	Agree
Peer Support	1.00	5.00	3.896	.707	Agree
Academic Resilience	1.00	5.00	3.773	.706	Agree
Academic Success	1.00	5.00	3.774	.710	Agree

Note. Min. = Minimum; Max. = Maximum; M = Mean; SD = Standard Deviation; LA = Level of Agreement

Exploratory Factor Analysis and Reliability Test

An exploratory factor analysis (EFA) was conducted using a separate preliminary sample ($n = 95$) as a preliminary assessment of the factor structure to support item screening and refinement of the measurement scales. Item retention was guided by theoretical relevance and statistical evidence. Factor loadings ranged from .729 to .838, exceeding .60, while KMO values ranged from .716 to .780, indicating satisfactory factor loadings and sampling adequacy. All five constructs met the recommended criteria for eigenvalues and cumulative variance. Eigenvalues ranged from 2.38 to 3.10, exceeding 1, while cumulative variance explained ranged from 60.00% to 62.01%, meeting the 60% criterion.

Self-Directed Learning showed the highest eigenvalue ($E = 3.10$) and cumulative variance explained ($Cu\% = 62.01\%$). Overall, the measurement items met the required statistical and theoretical criteria. Reliability results further supported item retention, with Cronbach's alpha values ranging from .771 to .846, exceeding .70, and AIIC values ranging from .458 to .542, within the acceptable .30–.70 range. These results indicate that the retained items consistently measured their intended constructs, revealed satisfactory internal consistency, and avoided excessive item redundancy, thereby providing a reliable measurement foundation for subsequent CFA and SEM analyses, as shown in Table 5.

Table 5. Results of factor analysis and reliability analysis

Constructs		Factor Analysis				Reliability Test	
		FL	KMO	E	Cu%	α	AIIC
Self-directed Learning							
SDL1	I independently review previous lessons to strengthen my understanding of course content.	.743	.740	3.10	62.01	.846	.542
SDL2	I independently solve academic problems when completing my university studies.	.829					
SDL3	I connect what I learn in class with the knowledge and experiences gained outside the classroom.	.796					
SDL4	I independently seek information to improve my research and reading skills.	.759					
SDL5	I prepare for upcoming lessons by exploring relevant ideas and learning materials in advance.	.807					
Self-efficacy		FL	KMO	E	Cu%	α	AIIC
SE1	I believe I can manage my study time effectively to meet my academic responsibilities.	.793	.716	2.38	60.00	.771	.458
SE2	I think I can organize and complete my academic tasks effectively.	.745					
SE3	I believe I can manage academic stress effectively during my university studies.	.736					
SE4	I believe I can overcome the challenges that arise in my academic studies.	.807					
Peer Support		FL	KMO	E	Cu%	α	AIIC
PE1	My peers help me understand difficult course content when I need academic support.	.805	.780	2.45	61.33	.789	.484
PE2	My peers share useful knowledge and advice that helps me improve my academic work.	.756					
PE3	My peers encourage and motivate me to remain committed to my studies while working.	.802					

PE4	My peers offer support when I encounter difficulties balancing my work and study responsibilities.	.769					
Academic Resilience		FL	KMO	E	Cu%	α	AIIC
AR1	I remain focused on my academic studies even when I face difficult situations.	.772	.731	2.41	60.15	.779	.468
AR2	I can recover and continue studying after experiencing academic setbacks.	.756					
AR3	I persist in completing my academic tasks when I face difficulties.	.797					
AR4	I can adapt to challenging academic situations and find ways to overcome them.	.777					
Academic Success		FL	KMO	E	Cu%	α	AIIC
AS1	I perform well in my university courses while managing my work responsibilities.	.817	.766	2.44	60.81	.782	.473
AS2	I complete my academic assignments and requirements on time.	.784					
AS3	I achieve the academic goals I set for myself.	.838					
AS4	I can apply what I learn in class to complete academic tasks effectively.	.729					

Confirmatory Factor Analysis

A CFA was conducted in the second stage using the main sample ($n = 385$) to validate the measurement model and confirm the factor structure identified through EFA using an independent preliminary sample. The CFA was conducted to assess the measurement properties of the latent constructs before testing the structural model. The analysis was performed in two stages, including the first-order factor model and the second-order factor model. In the first-order CFA, the observed items were specified to load on their respective latent constructs. The initial assessment indicated that most retained items demonstrated standardized loadings above the recommended level of .60. However, SE4 was removed during the first-order CFA because its standardized loading was .659. Although this loading exceeded the minimum acceptable level of .60, it was below the more desirable threshold of .70. A standardized loading of .659 indicates that the item explains approximately 43.4% of its variance through the underlying construct (i.e., $(.659)^2 = .434$), leaving a relatively large proportion of unexplained variance.

Therefore, retaining this item could weaken the convergent validity of the construct, particularly the average variance extracted (AVE), and potentially affect the overall discriminant validity of the measurement model. Accordingly, SE4 was removed to improve the measurement quality and provide stronger evidence of construct validity. Following the removal of SE4, the second-order factor model was assessed to examine the higher-order structure of the measurement model. During this stage, AR1 and AS1 were removed based on evidence from the CFA, including cross-loadings, relatively high modification indices, and conceptual overlap among indicators. These findings suggested potential item redundancy and insufficient discriminant clarity. The removal of these items resulted in a more parsimonious measurement model with improved construct validity and theoretical distinctiveness. After the removal of SE4, AR1, and AS1, the final CFA measurement model demonstrated an acceptable overall fit.

The chi-square value was $\chi^2 = 287.313$ with 125 degrees of freedom, and the chi-square-to-degrees-of-freedom ratio was $\chi^2/df = 2.299$, indicating an acceptable model fit. The RMSEA = .058 also indicated an acceptable level of approximate fit. The incremental fit indices demonstrated satisfactory to good model fit, with NFI = .932, CFI = .960, TLI = .951, IFI = .961, and RFI = .917. In addition, the absolute fit indices were satisfactory, with GFI = .924 and AGFI = .896. Overall, these fit indices indicate that the final measurement model achieved an acceptable model fit and provided adequate evidence for the validity of the measurement structure. Therefore, the validated measurement model was considered appropriate for subsequent structural model analysis. The CFA results are presented in Table 6.

Table 6. Confirmatory Factor Analysis Model Fit Indices

Models	χ^2	df	p	χ^2/df	RMSEA	NFI
Results	287.313	125	>.001	2.299	.058	.932
Criteria				Acceptable Fit	Acceptable Fit	Acceptable Fit
Models	CFI	GFI	AGFI	TLI	IFI	RFI
Results	.960	.924	.896	.951	.961	.917
Criteria	Good Fit	Acceptable Fit	Acceptable Fit	Good Fit	Good Fit	Acceptable Fit

Convergent Validity and Composite Reliability

Table 7 shows satisfactory convergent validity and internal consistency of the measurement model. Standardized loadings (λ) ranged from .720 to .818, exceeding .60, with all loadings significant at $p < .001$. CR values ranged from .798 to .888, indicating good internal consistency, while AVE values ranged from .555 to .614, exceeding .50 and supporting convergent validity. Cronbach's alpha values ranged from .797 to .888, further confirming adequate reliability. Although SE4, AR1, and AS1 were removed during CFA due to measurement and model specification concerns, their removal did not compromise the measurement model. The remaining items continued to meet the recommended criteria for factor loadings, CR, AVE, and Cronbach's α . Overall, the final measurement model demonstrated adequate reliability and convergent validity, supporting its use in subsequent structural analysis.

Table 7. Confirmatory factor analysis results

Constructs	Standardized (λ)	t-value	p-value	CR	AVE	α
Self-directed Learning						
SDL5	.786	—	—	0.888	0.614	.888
SDL2	.765	16.742	***			
SDL3	.798	16.195	***			
SDL4	.797	17.068	***			
SDL1	.771	16.345	***			
Self-efficacy						
SE3	.779	—	—	0.798	0.568	.797
SE1	.738	14.604	***			
SE2	.743	14.707	***			
Peer Support						
PS2	.774	—	—	0.833	0.555	.832
PS1	.736	14.463	***			
PS3	.720	14.731	***			
PS4	.749	14.112	***			
Academic Resilience						
AR2	.790	—	—	0.809	0.586	.822
AR3	.782	15.505	***			
AR4	.723	16.836	***			
Academic Success						
AS2	.818	—	—	0.821	0.604	.808
AS3	.732	15.986	***			
AS4	.780	14.578	***			

Discriminant Validity of Constructs

According to Table 8, all square roots of the average variance extracted ($\sqrt{\text{AVE}}$) values, ranging from .745 to .784, exceeded the corresponding inter-construct correlations, supporting satisfactory discriminant validity based on the Fornell-Larcker criterion. The correlation analysis also showed

significant positive relationships among all constructs, with coefficients ranging from .640 to .727 ($p < .01$). The strongest correlation was observed between AR and AS ($r = .727$). Overall, the findings confirm that the constructs are empirically distinct while maintaining meaningful positive relationships.

Table 8. Discriminant Validity and Correlation Matrix

Constructs	SDL	SE	PE	AR	AS
SDL	.784				
SE	.658**	.754			
PE	.700**	.664**	.745		
AR	.640**	.722**	.642**	.766	
AS	.691**	.662**	.641**	.727**	.777

Note. Bold diagonal values represent $\sqrt{\text{AVE}}$; off-diagonal values indicate inter-construct correlations; ** Correlation is significant at the 0.01 level (2-tailed)

Common Method Bias

Given that the study relied on a single-source, self-reported questionnaire administered at one point in time, common method bias was assessed using a two-stage approach. First, Harman's single-factor test showed that the first factor accounted for 51.104% of the total variance, indicating a potential concern regarding CMB. Subsequently, the common latent factor (CLF) technique was applied within the CFA model by comparing standardized loadings before and after CLF inclusion. Although some differences exceeded the .20 threshold, suggesting some common method effects, CMB was not considered sufficiently substantial to undermine the findings. Nevertheless, its potential influence cannot be entirely ruled out given the single-source and cross-sectional nature of the data, and the findings should therefore be interpreted with appropriate caution.

Structural Equation Modeling Results

According to the SEM results shown in Figure 2, self-directed learning ($\beta = .13$), self-efficacy ($\beta = .76$), and peer support ($\beta = .34$) have positive effects on academic resilience. Among these predictors, self-efficacy demonstrates the strongest effect on academic resilience, followed by peer support and self-directed learning. The strong effect of self-efficacy suggests that confidence in managing academic tasks supports students' persistence and adaptation to difficulties. Similarly, peer support helps students cope with challenges through encouragement and assistance. Although weaker, self-directed learning also contributes to academic resilience through independent learning management. Furthermore, self-directed learning ($\beta = .17$), self-efficacy ($\beta = .34$), peer support ($\beta = .17$), and academic resilience ($\beta = .49$) all show positive effects on academic success. Academic resilience has the strongest direct effect, suggesting that students who can adapt to and persist through academic challenges are more likely to achieve academic success.

Self-efficacy also has a notable effect, indicating that confidence in managing academic tasks supports students' academic achievement. Meanwhile, self-directed learning and peer support show weaker but positive effects, suggesting that independent learning skills and support from peers also contribute to academic success. Overall, the structural model suggests that both students' personal characteristics and social support contribute to academic resilience and academic success, with academic resilience serving as a particularly important predictor of academic success. These findings are particularly relevant to working undergraduate students, who must balance academic demands with employment responsibilities and therefore may rely on both personal capabilities and social support to sustain their academic progress.

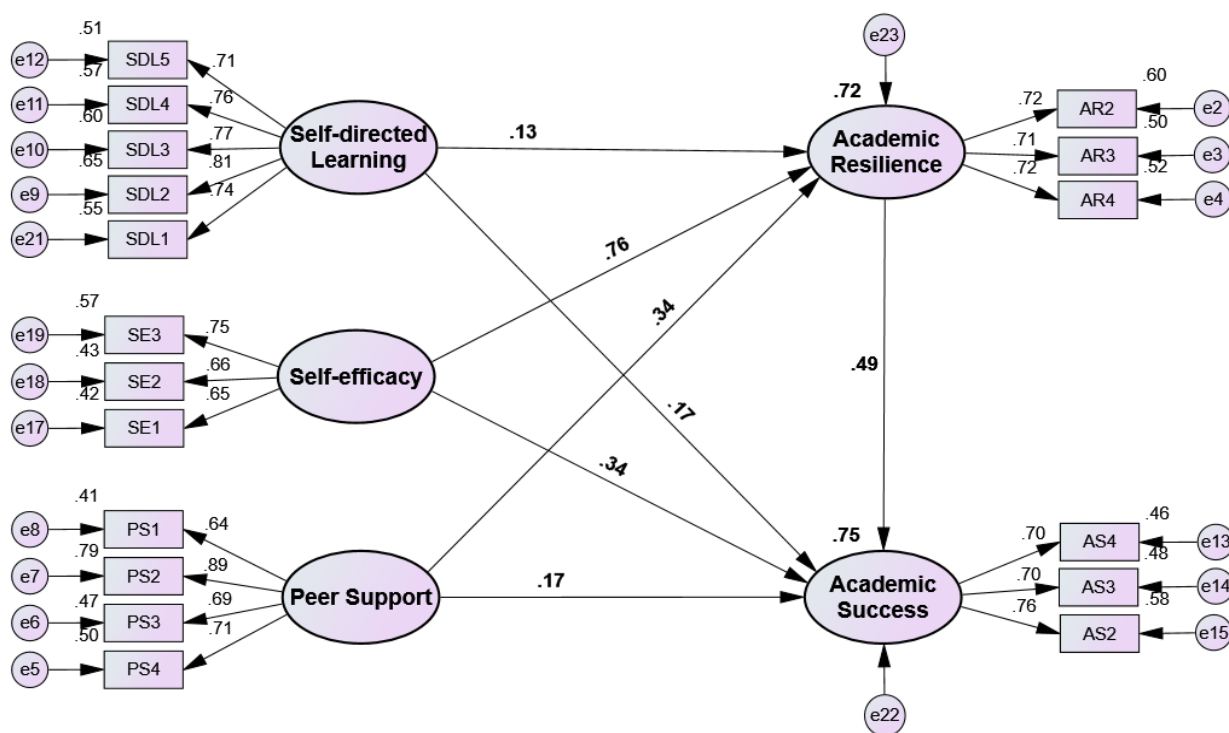


Figure 2. Proposed structural equation model results

Additionally, Table 9 presents the standardized path coefficients, t-values, and p-values for all hypothesized relationships. The findings indicate that H1, H2, H3, H4, H5, H6, and H7 are supported, as all hypothesized paths are statistically significant at the 0.05 level. Among the predictors of AR, SE ($\beta = .763$) demonstrated the strongest effect, followed by PS ($\beta = .340$) and SDL ($\beta = .131$). For AS, AR ($\beta = .493$) showed the strongest effect, followed by SE ($\beta = .340$), SDL ($\beta = .174$), and PS ($\beta = .167$). In addition, the squared multiple correlation coefficient (R^2) for AR was .72, indicating that SDL, SE, and PS collectively explain 72% of the variance in AR. Similarly, the R^2 for AS was .75, indicating that SDL, SE, PS, and AR collectively explain 75% of the variance in AS. These findings suggest that the structural model demonstrates strong explanatory power in explaining both AR and AS among working undergraduate students.

Table 9. Hypothesis Testing Results

Constructs	Hypothesis	Path Relations	β	t-value	p-value	Results
SDL	H1	SDL $\rightarrow$ AR	.131	2.646	.008	Supported
SE	H2	SE $\rightarrow$ AR	.763	6.173	.000	Supported
PS	H3	PE $\rightarrow$ AR	.340	6.430	.000	Supported
SDL	H4	SDL $\rightarrow$ AS	.174	3.661	.000	Supported
SE	H5	SE $\rightarrow$ AS	.340	2.628	.009	Supported
PS	H6	PE $\rightarrow$ AS	.167	2.651	.008	Supported
AS	H7	AR $\rightarrow$ AS	.493	3.662	.000	Supported

Note. β =standardized path coefficient; path significance is as follows: * $p < .05$, ** $p < .01$, *** $p < .001$, t-value > 1.96

Discussion

The findings indicate that self-directed learning, self-efficacy, and peer support are key factors in developing academic resilience among working undergraduate students in Cambodia. Among these, self-efficacy showed the strongest impact, followed by peer support and self-directed learning. This suggests that Cambodian students who work while studying may especially benefit from confidence in

their ability to manage academic responsibilities and overcome challenges resulting from balancing work and study. Peer support is also vital because working students may have limited time for academic interactions, making encouragement, help, and information from classmates valuable when facing academic difficulties.

Although self-directed learning had a weaker influence, it remains important because working students need to independently organize their learning, manage study time, and complete academic tasks despite job commitments. These findings align with previous research that highlights self-efficacy, self-directed learning, and social support as important resources for students' academic resilience and adjustment. The results also support Social Cognitive Theory (SCT) and Social Support Theory (SST). From an SCT perspective, self-efficacy and self-directed learning offer personal and behavioral resources that help students handle demanding situations. This is especially relevant for Cambodian working undergraduates, who must juggle academic demands with employment responsibilities.

Meanwhile, the positive impact of peer support aligns with SST, as interpersonal encouragement and assistance can help students cope with academic challenges. For working students, supportive classmates might offer academic information, help with coursework, and encouragement when work obligations limit available study time. Thus, both individual skills and social resources are important for maintaining academic resilience. The findings also show that self-directed learning, self-efficacy, peer support, and academic resilience significantly contribute to academic success, with academic resilience having the strongest effect. This aligns with existing research suggesting that students who adapt to difficulties, persevere, and continue their academic efforts despite challenges are more likely to achieve positive outcomes.

Self-efficacy helps students sustain effort and manage competing responsibilities, while self-directed learning enables them to take greater ownership of their studies when work schedules restrict supervised learning opportunities. Likewise, peer support can provide academic help and encouragement that supports students in progressing while balancing work and university studies. The model demonstrated strong explanatory power, with self-directed learning, self-efficacy, and peer support accounting for 72% of the variance in academic resilience, and these factors, along with academic resilience, explaining 75% of the variance in academic success.

Overall, these results suggest that personal, behavioral, social, and resilience-related factors together offer a comprehensive explanation of academic outcomes among Cambodian working undergraduate students. Enhancing self-efficacy, self-directed learning, peer support, and academic resilience may therefore help working students stay academically engaged and achieve better results. However, since the study was conducted among working undergraduate students at a private university, the findings may not fully apply to students from other private or public universities in Cambodia.

CONCLUSION

Conclusion

The primary objective of this study was to investigate the factors influencing academic success among working undergraduate students in Cambodia, with particular attention to the roles of self-directed learning, self-efficacy, peer support, and academic resilience. According to the SEM results, self-directed learning, self-efficacy, and peer support had positive effects on academic resilience. Among these factors, self-efficacy demonstrated the strongest effect, followed by peer support and self-directed learning. These findings suggest that confidence in managing academic responsibilities, support from peers, and independent learning skills are important for helping working students adapt to academic challenges.

Furthermore, self-directed learning, self-efficacy, peer support, and academic resilience all had positive effects on academic success. Academic resilience demonstrated the strongest effect, indicating that students who can adapt to difficulties, remain persistent, and continue their academic efforts despite work and study demands are more likely to achieve academic success. Self-efficacy also showed a notable effect, while self-directed learning and peer support contributed positively but comparatively less strongly. Overall, the findings suggest that both personal capabilities and social support contribute

to academic outcomes, with academic resilience serving as a particularly important predictor of academic success among working undergraduate students.

Overall, this study provides empirical evidence of the combined roles of personal, behavioral, social, and resilience-related factors in explaining academic success among working undergraduate students in Cambodia. The findings highlight the importance of strengthening self-efficacy, self-directed learning, peer support, and academic resilience to help students manage the demands of employment and higher education. However, the study was conducted among working undergraduate students at a single private university; therefore, the findings should not be overgeneralized to students from other private or public universities in Cambodia. Future research may examine these relationships across different universities, geographical areas, and student groups to provide broader evidence.

Implications of the Study

This study provides an insightful theoretical and practical understanding of academic success among working undergraduate students in Cambodia. Theoretically, the findings demonstrate the value of integrating personal, behavioral, social, and resilience-related factors to explain academic outcomes. The significant effects of self-directed learning, self-efficacy, and peer support on academic resilience support the relevance of Social Cognitive Theory and Social Support Theory in explaining how students manage academic challenges. Moreover, the strong effect of academic resilience on academic success indicates that resilience is an essential mechanism through which working students adapt to difficulties and sustain academic progress.

The findings also extend prior research by providing empirical evidence from the Cambodian higher education context, particularly among students combining employment with undergraduate study. Practically, the findings have implications for working students, educators, and higher education institutions. Universities and educators should foster self-efficacy by helping students develop confidence in managing academic responsibilities and overcoming difficulties. Self-directed learning can be strengthened through activities that promote independent learning, effective study management, and academic responsibility, particularly when employment limits students' study time. Peer support should also be encouraged through collaborative learning, peer assistance, and supportive classroom environments.

In addition, institutions may provide academic support, mentoring, peer-support activities, and flexible learning opportunities to strengthen academic resilience and help students manage competing work and study requirements. Students themselves also play a crucial role in improving academic success. They should take responsibility for their learning by developing self-directed learning behaviors, building confidence in managing academic tasks, seeking peer support, and strengthening resilience to adapt to challenges and remain persistent while balancing work and study. These practices may help working students manage competing employment and academic demands and sustain their academic progress.

Limitations and Future Research

This study provides empirical insights into the determinants of academic success among working undergraduate students in Cambodia; however, several limitations should be acknowledged. First, the study was conducted at a single private university. It included a higher proportion of female than male students, which may limit the generalizability of the findings to other institutional and demographic contexts. Second, the study focused on a specific group of working undergraduate students, and therefore, the findings may not fully represent students with different academic, employment, or personal circumstances.

Third, the sample size was determined based on the required sample-size calculation, but the use of convenience sampling may have limited the representativeness of the sample. Future studies could employ larger and more diverse samples using probability-based sampling across multiple public and private universities and different student contexts. Fourth, the study employed a quantitative, cross-sectional design based on self-reported questionnaire data, which limits causal interpretation and may introduce response bias. Although both Harman's single-factor test and the common latent factor approach were used to assess common method bias, such bias cannot be entirely ruled out.

Future research could adopt longitudinal or mixed-methods approaches and incorporate multiple data sources to strengthen causal interpretation and reduce potential common-method bias. Finally, the literature reviewed for this study primarily covered publications from 2020 to 2026. Future research could incorporate a broader range of foundational and recent studies to provide a more comprehensive understanding of academic success among working undergraduate students. Further research should also validate the proposed model using larger and more diverse samples across different Cambodian universities and contexts to assess its robustness and generalizability.

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COMPETING INTERESTS

The author declares that there are no competing interests associated with this study.

DECLARATION OF AI USAGE

The author used Grammarly to improve language clarity and consulted ChatGPT for explanations of statistical concepts and formulas. All research design, analysis, interpretation, and conclusions remain the author's original work and intellectual contribution.

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