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EDITED BY

Amna Mirza,
University of Delhi, India

REVIEWED BY

Chiara Pecini,
University of Florence, Italy
Syed Nadeem Fatmi,
Jamia Millia Islamia, India

*CORRESPONDENCE

Jessa B. Manulat
✉ jessa.banzon@gws.ctu.edu.ph

RECEIVED 22 May 2025

ACCEPTED 29 July 2025

PUBLISHED 10 October 2025

CITATION

Manulat JB (2025) Key predictors of academic success in flexible learning environments: a PLS-SEM analysis. *Front. Educ.* 10:1633040. doi: 10.3389/feduc.2025.1633040

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Key predictors of academic success in flexible learning environments: a PLS-SEM analysis

Jessa B. Manulat*

College of Education, Arts, and Sciences, Cebu Technological University Carmen Campus, Cebu, Philippines

This study analyzed the predictors of academic success in flexible learning environments among the college students who experienced the flexible learning modality from a state university in Cebu, Philippines. Specifically, it examined how academic success is affected by the key predictors such as the school climate, motivation, personal development, and study habits. The study was conducted among the 1,113 purposively sampled second to fourth year students enrolled in various academic programs across the different satellite and extension campuses of the university. It employed a descriptive quantitative research design. The data were gathered using an online survey through Google Forms. Data gathered were then analyzed using Partial Least Squares Structural Equation Modeling (PLS SEM) to determine the relationships between the identified key predictors and academic success. Findings revealed that school climate, personal development, and study habits significantly predict academic success. However, motivation was not one of the significant predictors in the context of academic success in flexible learning environments. Based on the findings, it is concluded that both institutional and individual factors—such as ensuring a supportive and conducive school climate, improving students' personal development, and cultivating a structured study habits—are essential to achieving academic success in flexible learning environments. The study recommends the development and implementation of targeted intervention programs to address these factors and enhance students' success in similar education settings.

KEYWORDS

academic success, flexible learning, flexible learning environments, school climate, study habits, personal development

Introduction

Academic success has emerged as a key area of focus in educational research, shaping individual futures and societal progress. Defined broadly, academic success includes attaining high grades, persistence through graduation, and acquiring essential skills that contribute to a student's personal, social, and professional life (York et al., 2015). Researches have showed that academic achievement as a key determinant of academic success is associated with stability, socioeconomic mobility, and overall aspects (Tinto, 2012). Based on these findings predictors of academic success has been an essential topic for researchers.

At the global level, the pandemic brought disruptions worldwide, causing various effects on the economy, health, and education (Mishra, 2020). This has caused problems to many including the restrictions in terms of mobility and programs. Based on UNESCO, schools have been closed worldwide at a rate of more than 90% during the time of pandemic in the year 2020 which has caused much to around 1.6 billion students (Kristof, 2020).

This drastic shift from full face to face class to distance learning has been extreme since the key drivers of education must adapt to it abruptly. The drastic change caused negative impact to educators since everyone must adapt to it regardless of previous background about distance learning. It resulted to issues on mental health and well-being (Kohout et al., 2022). These challenges were common in developing countries, where problems with limited infrastructure, financial aspects, and policy making definitely hindered effective education (Ntorukiri et al., 2022).

In the Philippine context, higher education institution benchmarked this global transition. Similar to the study of Qazi et al. (2024) higher education institutions in the Philippines underwent a drastic shift in education, transitioning from full face-to-face classes to online learning in March 2020 as a direct solution due to the pandemic. This sudden change in the educational landscape affected the students, educators, and the educational community. Higher education institutions started full online classes by then. However, in September 2022, Senator Pia Cayetano urged State Universities and Colleges (SUCs) to resume face-to-face classes to ensure budget allocations (Alagao et al., 2025). Consequently, institutions quickly moved from complete online learning to blended or flexible approaches, eventually returning to face-to-face classes supplemented with blended instructional methods.

To better understand the context of this study, it is crucial to distinguish between learning modalities. Face-to-face mode of learning is when the student and the teacher are physically interacting about the lesson in a manner that there is an immediate response to each other's concern (synchronous). On the other hand, online learning is a mode of learning where the student and the teacher are not physically interacting about the lesson however there is an immediate response to each other's concern (synchronous) if they meet on the specific time but there is a chance that the response is not immediately delivered (asynchronous) when the time is not set. Furthermore, flexible mode of learning is a combination of the benefits of face to face and online learning because it involves both synchronous and asynchronous mode of learning because there is an option for location and time flexibility.

Flexible learning became a strategy for accessible education, which offers online and in-person learning to cater to the diverse student needs (Kör et al., 2013). This strategy is often referred to as "open learning", "distance learning", and "e-learning". Flexible learning focus on student centered convenience since according to Mallow (2023), students can choose the time, place, and method of learning. Furthermore, it proved to be effective in promoting education despite the global disruptions. Research findings from Bozkurt and Sharma (2020) showed that there is an advantage for students who came from schools who follow educational mandates as shown in the performance of students in flexible learning environments who cope better when transitioning to returning to face-to-face classes. These flexible learning environments provide access to education, bridging the gap for those facing problems with the traditional learning modality.

International studies have already identified predictors of academic success in both face-to-face and online learning. Accordingly, academic success is influenced by multiple factors, as identified in existing literature. These include self-efficacy (Vuong et al., 2010), class attendance (Muller, 2015), time management

skills (Lahmers and Zulauf, 2000; Killen, 1994; Killen et al., 2003), motivation (Talbot, 1990), peer support (Gainen, 1995), and the quality of teaching (Bartz and Miller, 1991). In addition, aspects like school climate, personal development, and study habits are critical to academic outcomes (Dalton and Crosby, 2011; Daily et al., 2019). Another study highlighted that flexibility in learning schedules, modality together with personal dedication are factors where academic success is met (Nguyen and McGuirk, 2022). Other predictors to consider in academic success are school climate, motivation, personal development, and study habits. School climate is really important in ensuring positive student health and outcomes but is still under further investigation. A study of Daily et al. (2019) showed that learning is dependent on several factors including the institutions' curriculum, mandates, and social economic status. Studies from Dalton and Crosby (2011) also stressed that study habits and personality development influence students' academic success.

However, in the Philippine setting, limited studies explored how these predictors function within flexible learning environments, most specially in the post-pandemic era. Most of the predictors are for face-to-face classes, and some are in online classes, but not much comparison among the various predictors has been done in flexible learning. In this scenario, the researcher would like to assess the possible significant relationship between the factors affecting academic success in flexible learning environments, such as school climate, motivation, personal development, and study habits. It will give new theoretical insight into the key drivers in achieving success in flexible learning.

To address this gap, this work assessed the relationship between school climate, motivation, personal development, study habits and academic success among college students flexible learning environments. Validate the model through the Partial Least Squares Structural Model to contribute theoretical and empirical insights specific to Philippine context, while also aligning with global discussions on academic success in various learning modalities.

Hypothesis development

Model

H1

School climate positively affects academic success.

H2

Motivation positively affects academic success.

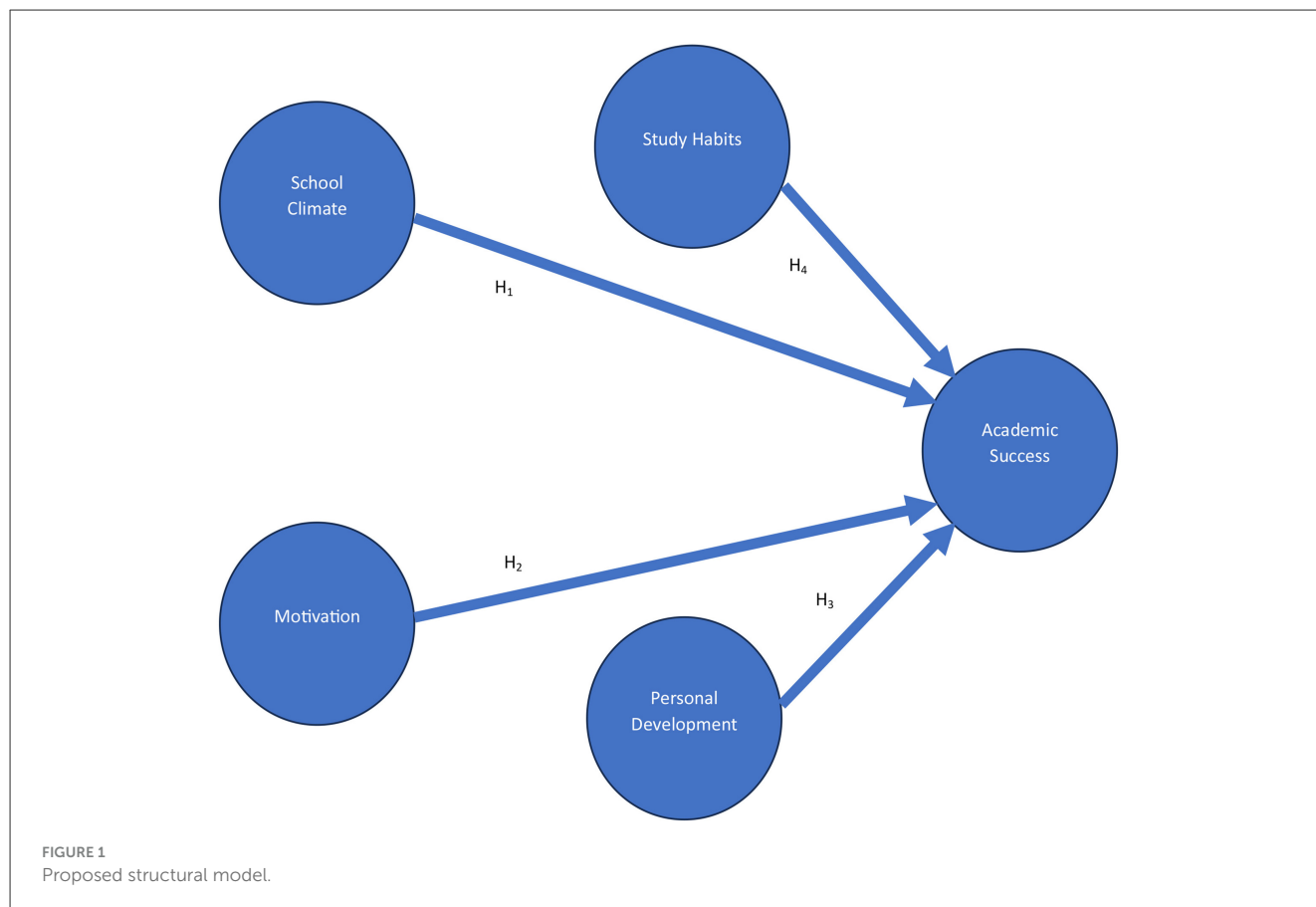
H3

Personal development positively affects academic success.

H4

Study habit positively affects academic success.

The study explored the relationship between school climate, motivation, personal development, study habits, and academic success in flexible learning environments. Its connections are illustrated in the structural model in Figure 1.



Methodology

Design

To determine the significant key predictors of academic success in flexible learning environments, this research paper utilized a descriptive quantitative research design. This paper specifically examined which of the key predictors affecting academic success in flexible learning environments; school climate, motivation, personal development, and study habits, have been found significant using the tool used. This study employed an adopted survey questionnaire to gather the data. Furthermore, the gathered data was analyzed using Structural Equation Modeling (SEM) in order to test the hypothesis. Specifically, this paper used the Partial Least Square – Structural Equation Modeling (PLS-SEM) to understand the relationship among the key predictors affecting academic success.

Environment

This research was conducted across the various campuses of a state university in Cebu, Central Visayas, Philippines. The campuses involved in this research encompass a wide geographical spread, representing diverse areas and communities, which includes northern, southern, and central campuses. The study gathered respondents from the various extension and satellite campuses. The sampling technique resulted to getting

a comprehensive cross-section of the respondents from various campuses thereby allowing for a diverse demographic backgrounds and academic profiles, thus ensuring generalizability and strength of the results.

Respondents

The targeted participants of this research are the second to fourth year students of the academic year the study was conducted. To invite the second to fourth year students across multiple campuses of a state university in Cebu Philippines, this research utilized a purposive sampling method. The inclusion criteria of the participants include students who have undergone the face-to-face class and distance learning from the various colleges across the different campuses within the university, ensuring a representative mix of academic disciplines and backgrounds.

The data collection was done through an online survey using Google Forms. This method was utilized due to its accessibility, logical efficiency facilitating participation across various campuses thereby allowing broad sample of respondents. Before the survey was conducted, the respondents were required to read, review, and understand the informed consent form. Once they have agreed, they will complete the form confirming their voluntary participation.

In addition, the study incorporated elements of random sampling within the online survey distribution to improve generalizability. Ultimately, the study yielded a total sample size of 1,113 respondents.

TABLE 1 Demographic characteristics of the respondents ($N = 1,113$).

Category	<i>n</i>	%
Gender		
Male	300	26.95
Female	771	69.27
LGBTQIAA+++	35	3.14
Prefer not to say	7	0.63
Civil status		
Single	1,101	98.92
Married	10	0.90
Separated	1	0.09
Widowed	1	0.09
Age (in years)		
15–20	427	38.36
21–25	651	58.49
26–30	27	2.43
31 and above	8	0.72
Senior high school track		
Academic	698	63
TVL	307	28
Arts and design	7	0.6
Sports	13	1.2
Old curriculum	88	7.9
Senior high school strand		
GAS	377	34
STEM	58	5.2
HUMSS	224	20
ABM	67	6
ICT	80	7.2
Performing arts	1	0.1
Athletics	4	0.4
Fitness	1	0.1
TVL	234	21
Old curriculum	67	6
Combined family income range (in PHP)		
P131,483 to P219,140	5	0.45
P76,669 to P131,482	4	0.36
P43,828 to P76,668	8	0.72
P21,914 to P43,827	28	2.52
P10,957 to P21,913	128	11.50
Below P10, 957	940	84.46

Table 1 presents the demographic information of the respondents. Based on the data, out of the 1,113 respondents, 69.27% identified as female, 26.95% as male, and 3.14% as LGBTQIAA+++. A small portion of respondents, 0.63% preferred not to disclose their gender.

Most respondents were single, accounting for 98.92%, while a small fraction were married 0.90%. The remaining respondents were separated 0.09% or widowed 0.09%.

The largest age group represented was 21–25 years old, making up 58.49% of the sample, followed by 15–20 years at 33.36%. Respondents aged 26–30 comprised 2.43% of the population, with only 0.72% of participants who were 31 years and above. It is the same as in the study of [Vinas and Aquino-Malabanan \(2015\)](#) in their study among the college students of a state university in the Philippines; the majority of the respondents were female, but they differ in terms of age bracket since majority of the age of their respondents fall in the range of 16–20 years since during this time, senior high school was not yet implemented, thus it is the average for college students during that time. Therefore, in the modern education system in the Philippines, their result resulted to similar average age bracket as with the results of this study.

For the senior high school track, it showed that there are 63% of the students who belong to the Academic track; 28% TVL track; 7.9%, from the old curriculum; 1.2%, from the Sports track, and 0.6% from the Arts and Design. This shows that the majority of the respondents belong to the academic track. It is also evident since the majority of the schools in public senior high schools offer Academic tracks and strands. It is reflected in the study of [Sarmiento and Orale \(2016\)](#) that students who want to pursue college are taking up the academic track during their senior high school.

For the senior high school strand, results showed that 34% are from GAS strand, 21% from TVL, 20% from HUMSS, 7.2% from ICT, 6% from both the old curriculum as well as from ABM, 5.2 from STEM, 4 or 0.4% from athletics, and 0.1% each from both fitness and performing arts.

This shows that the majority of the strands of the students are from GAS which is under the academic track. This is in consonance with the results of the senior high school track, which is academic. It is also evident in the study of [Mamolo \(2019\)](#) that the majority of the respondents in his study are taking up the general academic strand (GA/GAS) from the academic track.

An overwhelming majority of respondents (84.46%, $n = 940$) reported a monthly family income below Php 10,957. Only 11.5% fell within Php 10,957 to 21,913, and even fewer reported incomes in higher brackets. Notably, 0.45% of respondents reported a combined family income of Php 131,483 or above, highlighting a predominantly low-income sample population.

This data revealed that the majority of the respondents are living below the poverty line. This is in congruence with their parents' occupation, which is none or not reported. It is also evident since one of the university's previous goal which is quality education for underprivileged students. It is in consonance with the study of [Cleofas and Rocha \(2021\)](#) that the majority of the student's monthly income is <P10,000.00. With that, the school should create a social environment that promotes positive relationships with students and ensures that necessary resources are available so that students can easily avail themselves of in relation to their role as a student.

Survey instrument

In this study, several instruments verified by prior researchers were used: Part 1 is the demographic profile of the respondents. The profiles of the respondents include age and gender, civil status,

parents’ occupation, combined monthly income, senior high school track and strand, and college program enrolled. Part 2 is a Likert scale survey on the students’ school climate, motivation, personal development, and academic success. The Likert scale on school climate was an adapted questionnaire from the study of [Zullig et al. \(2010\)](#). The Likert scale on students’ motivation was adapted from Gottfried’s study ([Gottfried, 1985](#)). The personal development survey was adapted from Sevig’s study ([Sevig et al., 2000](#)). For academic success, it was an adapted from the study of [Woodman and Parappilly \(2015\)](#).

Treatment of the data

The data were checked for internal consistencies to determine the extent to which measured items within the same construct were related ([Hajjar, 2018](#)). In improving internal consistency, items that showed lower intercorrelations were eliminated between the items linked to the measures and those representing other measures. After maintaining internal consistencies, construct validity, and determining a good fit for the proposed model, a final test on the structural model was conducted through bootstrapping. Data are analyzed using PLS-SEM software 4.

Results

Measurement model assessment results

Reliability and validity assessments were pivotal in validating the research findings. The study used confirmatory factor analysis to identify common method bias. Before structural model analysis, the model must pass for acceptable convergent and discriminant validity to be considered free of standard method bias ([Kock et al., 2021](#)). Employing Cronbach’s alpha, a benchmark for consistency, the internal reliability of constructs was rigorously examined. Composite reliability (CR) was presented, like Cronbach’s Alpha ([Netemeyer et al., 2003](#)).

Constructs such as School Climate, Personal Development, Study Habits, proved commendable scores of Cronbach’s Alpha and composite Reliability, ranging from 0.876 to 0.934 and 0.885 to 0.936, all categorizing them within the “Excellent” range. The robustness of the study was further supported by the analysis of factor loadings, which continuously fell between 0.667 and 0.850, ensuring individual item dependability (see [Table 2](#)).

Correlation matrices of constructs

The Fornell-Larcker criterion, introduced by [Fornell and Larcker \(1981\)](#), is a recognized method for confirming discriminant validity by comparing squared construct correlations with the AVE.

Moreover, [Henseler et al. \(2015\)](#) introduced the Heterotrait-Monotrait (HTMT) correlation ratio as an additional discriminant validity metric. A lack of discriminant validity is shown by HTMT scores near 1.0. Using the HTMT as a criterion involves comparing it to a predefined threshold. If the HTMT value exceeds this cutoff, discriminant validity is said to be absent. [Kline \(2023\)](#) proposes

TABLE 2 Measurement model assessment results.

Items	Loadings	AVE	Cronbach α	CR
M1	0.793	0.655	0.934	0.936
M2	0.818			
M3	0.819			
M4	0.847			
M5	0.849			
M6	0.85			
M7	0.754			
M8	0.815			
M10	0.743			
PD2	0.674	0.576	0.876	0.885
PD3	0.73			
PD4	0.813			
PD5	0.835			
PD6	0.827			
PD8	0.746			
PD10	0.667			
SC1	0.708	0.556	0.9	0.918
SC2	0.727			
SC4	0.698			
SC5	0.799			
SC6	0.788			
SC7	0.771			
SC8	0.776			
SC9	0.725			
SC10	0.712			
SH1	0.735	0.596	0.924	0.936
SH2	0.756			
SH3	0.729			
SH4	0.79			
SH5	0.797			
SH6	0.755			
SH7	0.835			
SH8	0.741			
SH9	0.779			
SH10	0.793			

α , Cronbach’s alpha; CR, composite reliability; AVE, average variance extracted; M, motivation; PD, personality development; SC, school climate; SH, study habits.

0.85 as the threshold. Based on [Table 3](#), the HTMT values are <0.85, which range from 0.550 to 0.779, which implies that it has discriminant validity. Moreover, since the model has an acceptable convergent and discriminant validity, it can be deduced that it is free of standard method bias ([Kock et al., 2021](#)).

TABLE 3 Heterotrait-monotrait (HTMT) ratio of correlation.

Variable	Academic success	Motivation	Personal development	Study habits	School climate
Academic success					
Motivation	0.595				
Personal development	0.682	0.699			
Study habits	0.716	0.689	0.713		
School climate	0.596	0.779	0.658	0.550	

TABLE 4 Test of relationship on the key predictors of academic success in flexible learning.

Predictors affecting academic success in flexible learning	B	t-values	p-values	Decision	Description
H1: SC -> AS	0.197	4.885	0.00***	Supported	Significant
H2: M -> AS	0	0	1.00 ns	Not supported	Not significant
H3: PD -> AS	0.249	5.981	0.00***	Supported	Significant
H4: SH -> AS	0.371	9.039	0.00***	Supported	Significant

*** $p < 0.001$.

ns, not significant; AS, Academic Success; SC, School Climate; M, Motivation; PD, Personal Development; SH, Study Habits.

Path coefficient results

This section presents the bootstrapping results, a focused test of the significance of the respondents' perceptions of the study's variables about academic success. Table 4 offers a deeper dive into the relationships, presenting coefficients, t -values, p -values, and hypothesis testing outcomes.

Results in Table 4 indicate strong relationships between variables: notably, school climate ($\beta = 0.197$, $p < 0.001$), personality development ($\beta = 0.249$, $p < 0.0001$, and study habits ($\beta = 0.371$, $p < 0.001$) have a significant influence on behavioral intention. These outcomes, supported by high t -values and significant p -values, affirm the critical roles of the constructs in determining the key predictors of academic success in flexible learning, solidifying the model's foundational constructs. The final model with coefficients and significance is presented in Figure 2.

Discussion

This section presents the PLS-SEM results, highlighting several key factors significantly related to motivation, school climate, personal development, study habits, and academic success in a flexible learning environment. The findings suggest that School Climate (H1), Personal Development (H3), and Study Habits (H4) significantly affect academic success in a flexible learning environment. At the same time, Motivation (H2) does not significantly affect academic success in a flexible learning environment.

Results revealed that school climate (H1) had a significant effect on academic success. School climate plays a crucial role in the academic success of a student since it involves the main key drivers of education namely the student, the parents, the teachers, the staff, and the administration as a whole (Ningtias et al.,

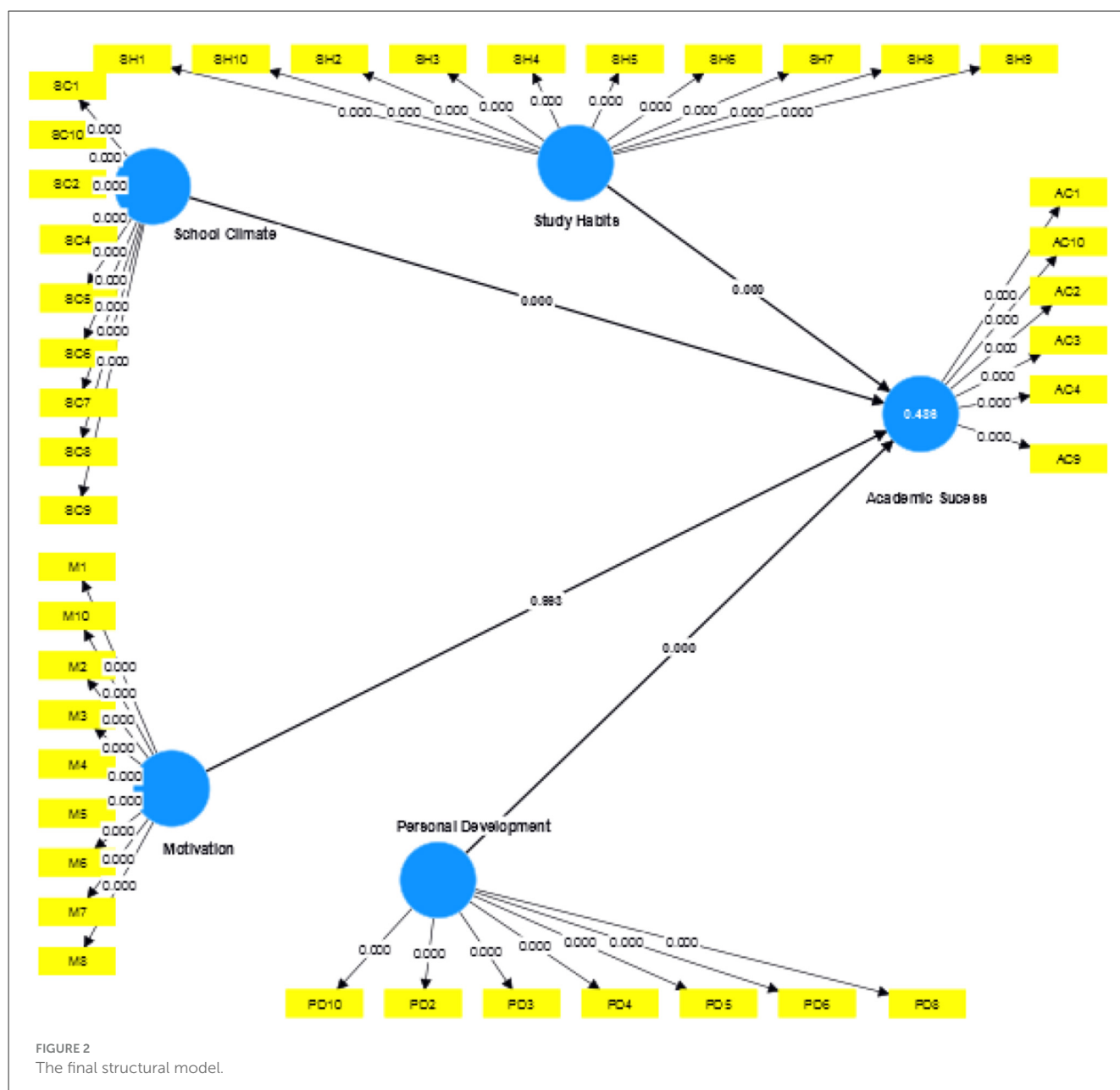
2021). Further, it involves the basic facilities to enhance various learning modalities.

This implies that the specific school climate of every learner affects their academic success (Daily et al., 2020). Also, a study shows that students with positive school climate perception tend to excel better (Ningtias et al., 2021), even in diverse and flexible learning environments. This relationship is true in teacher support, classroom management, and peer interaction. Positive perception of school climate was linked to improved performances thereby highlighting impact on cognitive development (Berkowitz et al., 2017; Wang and Degol, 2016).

Additionally, studies indicate that a supportive school climate can moderate the effects of socioeconomic disadvantages, allowing students from low social economic backgrounds to thrive academically. A well-managed disciplinary climate and feelings of safety create a conducive learning environment, which is especially critical in flexible or remote learning contexts (Cheema and Kitsantas, 2014; Ning et al., 2015).

The flexibility of learning modalities demands adaptability from students, and a stable school climate provides the emotional and structural support necessary for success. Students who feel connected to their school and perceive it as a safe and engaging place are more likely to demonstrate resilience and achieve their academic goals (Cohen and Geier, 2010; Morrison et al., 2013). A study highlighted that instructors must provide flexible learning environments so that students will improve self-efficacy and learning satisfaction (Gu and Sok, 2021).

Positive school climates, including supportive teacher-student relationships, student engagement, and a culture of academic emphasis, have enhanced student achievement. For instance, a study by Maxwell et al. (2017) on school climate resulted to the findings where academic emphasis, student-to-staff relations as well as values were highly correlated with an increase academic success.



The result also showed that Personal development (H3) significantly affects academic success. Personal development is crucial in predicting academic success, especially in flexible learning environments. Personal development is affecting academic success in a manner that is inevitable in nature. It embodies the totality of oneself including but not limited to physical, social, emotional and psychological aspect. One's way of handling oneself has a direct impact on its academic achievement and its future as a whole. Research suggests that various aspects of personal development, such as self-regulation, resilience, and personality traits, significantly impact students' academic outcomes.

For instance, personality traits have been found to have a significant effect on academic success more than other factors such as well-being or learning approaches. Moreover, [Moreira et al.'s \(2020\)](#) study revealed that personality significantly correlated

to academic success, such as the temperament and character dimensions. In fact, students with a pleasant personality exhibited better academic success than those with learning approaches or affective well-being.

Moreover, engagement, a crucial component of personal development, has been linked to better academic performance in flexible learning contexts. Flexible learning environments are also associated with electronic learning in which students engage actively with the topic together with their peers. Based on the findings of a study on the amount of student engagement in electronic learning, it was found out that students perform well academically when they show high behavioral engagement. Once students are engaged through various flexible learning opportunities, it is equated to enhancing their overall learning experience, which then turns into positive impacts on academic outcomes ([Kokoç, 2021](#)).

Furthermore, personal development is a key predictor of academic success in flexible learning environments and it is associated with words like personality engagement, and self-regulation. It shows that students who are improving their personal development skills most likely improve their academic success as well in flexible learning environments. It also includes recording of students' achievements, monitoring the progress, identifying strengths and weaknesses, focusing on students' progress as well as planning for future actions (Enkuzena et al., 2023).

Currently, emotional intelligence is linked to personal and academic success. In a study of Osma-Tan (2025) and Xu et al. (2023), they found out that as the emotional intelligence increases, there is a bigger chance that students manage stress effectively wherein they can understand their own emotions, learn how to think about others' sake rather than only their own benefit, which overall increases their personal and academic success. In cases when students learn about self-knowledge, they will learn on how to maneuver life's challenges including academic hurdles (Osma-Tan, 2025).

Research in Sustainability (2020) revealed that personality traits contribute much to deep learning, which in turn improves academic success. Personal development intervention like independent learning is the key to academic success in flexible learning environments (Furnham et al., 2013).

Self-efficacy, or the belief in one's ability to succeed in specific tasks, is a core aspect of personal development and a significant predictor of academic achievement. Studies in flexible learning contexts, such as online education, have shown that higher self-efficacy correlates with greater academic motivation, persistence, and performance (Artino, 2008). According to research published in *PLOS ONE* (2023), self-efficacy positively influences academic motivation, directly contributing to better outcomes in online learning.

In sum, personal development, through cultivating traits like personality, engagement, and self-regulation, is a significant predictor of academic success in flexible learning environments. These results underpinned that personal development together with academic skills is necessary in enhancing academic success.

Moreover, study habits (H4) significantly predict academic success in flexible learning. One's study habit positively affects academic success. Research shows that students with positive study habits tend to perform better academically. Studies found that strong study habits, including proper time allocation and regular review, positively correlate with academic success in various learning environments, including online education (Çakiroglu, 2014; Jafari et al., 2019). Students with various effective learning methodologies are linked to academic success (Viêt, 2022). Likewise, reading literacy is also linked to increase academic success (Talwar et al., 2022; Banat and Pierewan, 2019). It is in consonance with the study of Manulat (2023) that students need to improve study habits so that they will improve academically. It is supported by the study of Abid et al. (2023) that reading habits has a significant impact to academic success which includes reading strategies.

Similarly, good study habits, such as consistent self-study, homework completion, and proactive use of learning materials, directly influence higher academic achievement among students in distance learning settings (Sulaganni, 2016). Also, based

on the study of Magulod Jr (2019), there were significant relationships between learning styles, study habits, and students' academic performance.

Furthermore, study habits affect academic achievement directly and play a crucial role in reducing academic stress thereby helping students improve their academic performance in various flexible learning environments (Pathak, 2020). This resulted to cultivating strong study habits to students which are found to be beneficial to them in order for them to survive the varying flexible learning aspects where self-regulation and independent learning which are more critical than traditional settings. These results highlighted the importance of developing effective study habits as an important aspect in flexible learning concepts.

Therefore, cultivating strong study habits is essential for students to thrive in flexible learning situations, where self-regulation and independent learning are often more critical than in traditional settings.

These findings underscore the importance of developing effective study habits as a cornerstone for academic success, particularly in flexible learning contexts.

However, the analysis results also include the factors that are concretely unsupportive of the key predictors of academic success in flexible learning. Results revealed that motivation (H2) does not significantly affect academic success. One of the unexpected results of this research is the non-significance of motivation as a predictor of academic success in flexible learning environments. It has been presented by previous researches (Deci and Ryan, 1985; Pintrich and De Groot, 1990) that motivation has a positive impact to academic success however this study resulted the opposite.

For instance, studies examining the relationship between motivation and academic performance in online and blended learning settings found that while motivation contributes to academic outcomes, other factors such as emotional engagement, self-regulation, and psychological capital might be more influential in determining success (Liu and Du, 2024). Likewise, the study of Cetin (2015) is the same as the previous study, which showed that motivation was not correlated with academic achievement (Schmidt et al., 2006). There was only a correlation between "goal setting", one of the sub-factors of academic self-regulation learning, and GP. Motivation alone, particularly in the context of flexible learning, has shown mixed results, indicating that intrinsic and extrinsic motivation might not always predict performance effectively without supporting other psychological or emotional factors. For example, students may struggle to achieve high academic success in flexible learning without strong emotional engagement or a robust self-regulated learning approach, which can sometimes be more influential than motivation alone (Yu et al., 2022). Additionally, research has shown that intrinsic motivation is inversely proportional to the grade level (Ryan and Deci, 2000), which may help explain why motivation did not significantly predict success among college students in this study. Shala et al. (2024) similarly found that motivation and academic achievement at the tertiary level were not significantly correlated, suggesting that motivation's effect may be indirect or mediated by other variables like self-efficacy or engagement.

Findings from this study challenged that assumption suggesting that motivation may not have a direct influence on academic

success, in the context of flexible learning settings and among tertiary Filipino students in this post-pandemic era. This implies that there are other factors to consider which affected motivation based on other contexts.

Cultural aspect may also affect the results of motivation. Filipinos are extrinsically motivated by families, social norms and by poverty. It is complementary to the results of this study that the respondents' monthly family income wherein majority are living on the poverty line indicating that extrinsic goals like finishing the program and getting a job may play a dominant role than intrinsic academic motives (Salili, 1994). It is the same as with the results of Gagné and Perkins Driscoll (2022) that students are extrinsically motivated to succeed in school so they can escape poverty (Ryan and Deci, 2000). Afterall, motivation, whether intrinsic or extrinsic, does not guarantee significant academic performance enhancement (Achachagua et al., 2022).

Instructional and technological factors may also affect the results. Flexible learning in the context of asynchronous learning reduces engagement and social connection, in which both are very important to sustain intrinsic motivation (Ryan and Deci, 2000). If there's no face-to-face interaction, students feel disconnected and lower their interest and participation level. Settings results to lower cognitive effort thus lowers motivation level in school. Moreover, learners may have been constrained by poor internet connectivity, lack of quiet study spaces, and increased domestic responsibilities (Adedoyin and Soykan, 2020). Furthermore, artificial intelligence and peer chats can reduce academic integrity in flexible learning settings results to lower cognitive effort thus lowers motivation level in school. With all the easy access through various online tools, learners rely more on technological assistance and not on intrinsic motivation to understand the concept thus weakens motivation and academic efforts.

Methodologically, the questionnaire may incur conceptual misalignment that may have affected the results. Motivation, as a construct, in the questionnaire was not able to capture the concept of motivation among the learners today. Many of the items were anchored in intrinsic motivation such as personal interest in learning while flexible learning environments—specially during the pandemic—have shifted the focus to extrinsic motivation like submission of outputs, avoiding sanctions, or fulfilling expectations from family. The study focused only on the direct relationships through PLS-SEM, however it may have an indirect effect (Shala et al., 2024), mediated by other factors, rather than a direct effect on the academic success. In this case, the indirect effects such as mediating or moderating effects, were not explored.

Even if motivation, traditionally viewed as a key predictor of academic achievement, but was found insignificant in this research, just like the study of Lee (2022) on the South Korean students, that learning motivation did not directly correlate with academic achievement within a structural equation model framework, it is an eye opener for researchers to revisit how motivation functions in culturally diverse and technologically improving educational settings. The findings of this study align with emerging literature suggesting that motivation's impact may be indirect, mediated, or overshadowed by contextual, cultural, technological, and emotional variables. It calls for further research on local theories, context sensitive instrument, and further qualitative discussions to determine how and when does motivation affects academic success in flexible learning environments.

Implications

Several implications can be drawn out of this study. One implication is concerning the administration of the institution and the second is focusing on the student themselves. For the administration of the institution, since the school climate has been found to be a key predictor of students' success in flexible learning environments, this paper must give them the idea on which area to improve. It will become an eye opener for institutions to deal into other aspects like the infrastructures, the curriculum, the possible assistance they can give to foster flexible learning. It might include flexible arrangements in schedules, facilities, and educational resources in various platforms.

The second is the provision of insight to students as to the key predictors of academic success. It will equip them with knowledge as to what aspect to improve in dealing with academic success in flexible learning environments. As in the case of personal development, and study habits, it should be relayed to them that each one is significantly affecting the academic success thus it should be taken full consideration. They must find ways on how to improve oneself and how to improve their study habits.

Limitations and directions for future research

The limitation of this study is that it is limited to students who are enrolled in various campuses of a state university in the Philippines. Thus, it might have results that are strategically inapplicable to other studies.

Since this paper is quantitative and might lack in depth study, the researchers suggest on conducting qualitative analysis such as key informant interview and focused group discussions to triangulate the result that may include the students' lived experiences that could deepen the discussion as well as expound the findings about the relationship among the key predictors of academic success such as motivation, school climate, personal development, and study habits in a flexible learning environment.

Another area to investigate is the effect of AI tools on flexible learning. Investigating how AI can affect academic success can provide information for creating a supportive, flexible learning environment.

Another consideration is the assessment of the mediating or moderating effect of motivation in flexible learning settings still using PLS-SEM.

Another limitation of this study is that the researcher is the one administering the questionnaire through google forms to measure the constructs such as school climate, motivation, personal development, and study habits. Thus, there might be a potential self-report bias.

Finally, addressing ethical problems, such as data privacy, academic integrity, and accessibility, can considerably improve academic success in a flexible learning environment.

Conclusion

Based on the findings, school climate, personal development, and study habits are critical to academic success. Therefore,

a welcoming school climate encourages learning and supports student well-being where they can freely develop and improve themselves, thus enhancing their academic success. Personal development is also the key factor which contributes to students' ability by knowing their strengths and weaknesses thereby improving oneself to manage and keep up with the academic struggles. Moreover, consistent and correct study habits enable students to manage their academic responsibilities efficiently involving good time management skills leading to improved academic performance. These results highlight the need for a supportive school environment, personal growth and structured study habits to achieve academic success.

Based on the conclusion, it is recommended that the institutions enhance their school climate, find ways on how to improve students' personal development, and cultivate effective and efficient study habits in every student. Therefore, the university must ensure a welcoming atmosphere for the students to grow and develop their self-esteem. It includes but are not limited to ensuring a friendly but still professional atmosphere between students and faculty as well as students and staff; improve the school facilities to better suit the needs of the diverse learners; and update the curricula to include the latest technological innovation as well as allowing changes in set up to cater to flexible learning modalities in any form. Further, empowering the students to take control of their growth and development during their educational journey. It might include seminars and workshops on personal growth and development, team buildings, and other related activities to enhance oneself. Moreover, promoting efficient study habits by ensuring necessary resources are provided for students to access and avail quickly. It might include latest books, journal subscriptions, workshops on improving one's study habits and related activities. Incorporating each key predictor together, it will create a holistic academic success.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the study involving human samples in accordance with the local legislation and

institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

JBM: Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research and/or publication of this article.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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