# Effect of Motivation to Learn and Environmental Factors on University Students' Study Habits

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## ABSTRACT

**Aim.** The objective of this cross-sectional study was to analyse the relationship between age, sex, study environmental conditions, motivation to learn, and study habits among university students at the Technical University of Manabí, Ecuador.

**Methods.** A descriptive-correlational study with predictive scope was conducted using a non-experimental, cross-sectional design. A self-report questionnaire was administered to assess study environment conditions, motivation to learn, and study habits to 273 university students between October 2023 and January 2024. Descriptive statistics, correlational analyses, and multiple linear regression were performed using IBM SPSS Statistics (version 27).

**Results.** Descriptive analyses revealed high levels of motivation to learn, moderate levels of study habits, and comparatively lower levels of favourable environmental conditions for studying. Correlational analyses showed positive and significant associations between environmental conditions, motivation to learn, and study habits. The regression model explained 16% of the variance in study habits, identifying motivation to learn as the strongest predictor, followed by environmental conditions, while age was not significant and gender showed a small effect.

**Conclusions.** Study habits in higher education are better explained by the combined contribution of motivational and contextual factors than by static sociodemographic characteristics. Motivation guides academic engagement, while environmental conditions facilitate its stabilization in consistent study routines.

**Keywords**: study habits; motivation to learn; study environmental conditions; university students; learning environment; self-regulated learning; higher education.

## Introduction

Efficient use of time, along with the development of study skills, habits, and strategies, are fundamental to learning (Mappadang et al., 2022; Schuster et al., 2020). In particular, the formation of study habits in formal education is essential for developing appropriate academic behaviour. Study habits are considered to be common practices and tendencies that people adopt to acquire knowledge (Angkarini, 2021) and stable, conscious behaviour that is adopted to facilitate learning and access to knowledge (Ünal, 2021).

Recent studies have shown that study habits have a significant impact on academic performance and student satisfaction (George-Reyes et al., 2023) and are positively associated with high academic achievement (Aljaffer et al., 2024). Abdolreza Gilavand and Yasaman Emad (2021) and Agoestina Mappadang et al. (2022) further indicate that effective study techniques, such as time planning, stu-

dent interest in learning, and the suitability of learning spaces, are positively related to academic performance. However, having good study skills and habits is not always enough to overcome learning difficulties (Svartdal et al., 2021), as their effectiveness can be influenced by students' self-efficacy beliefs and academic engagement (Luo et al., 2023).

Other authors highlight that the superficial use of learning strategies (Biwer et al., 2020; David et al., 2024) and poor time management (George-Reyes et al., 2023) hinder the proper development of study habits. Furthermore, the behavioural patterns associated with study habits vary according to contextual and personal factors such as concentration, school environment, and study modality (David et al., 2024; Sánchez-Ramírez et al., 2022). These variations suggest that study habits cannot be understood in isolation, but rather as the result of the interaction between internal dispositions and external learning conditions.

In addition to motivational and environmental factors, sociodemographic characteristics such as age and gender have also been examined in relation to academic behaviour, although findings remain inconsistent and often depend on the inclusion of psychological mediators (Kaedabi-Donkor et al., 2025; Wang & Yu, 2023). This indicates the importance of analysing these variables within integrated models that simultaneously consider individual and contextual dimensions.

The development of study habits and their relationship to motivation and environmental conditions is fundamental to university learning and is part of a lifelong educational process (Cigdem & Oncu, 2024; Xu et al., 2022). However, empirical models that jointly examine sociodemographic variables, motivational processes, and environmental conditions to explain study habits are still needed, especially in Latin American higher education contexts.

With this background, the objective of this cross-sectional study was to analyse the relationship between age, sex, study environment conditions, motivation to learn, and study habits among university students at the Technical University of Manabí, Ecuador.

Based on theoretical framework and previous empirical evidence, the following research hypotheses were proposed:

H1. Age will be associated positively with study habits while sex, study environment conditions, and motivation to learn are considered simultaneously.

- H2. Female students are expected to report higher levels of study habits than male students when considered simultaneously with age, study environmental conditions and motivation to learn.
- H3. Study environment conditions will be positively associated with study habits when age, sex, and motivation to learn are considered simultaneously.
- H4: Motivation to learn will be positively associated with study habits when age, sex, and study environment conditions are considered simultaneously.

# Methodology

## Research Design

A cross-sectional design was used to investigate the associations between study environment conditions, motivation to learn, age, and gender study habits. This methodology enabled the analysis of relationships among the study variables and the estimation of their individual contributions to study habits, without inferring causality. Regression-based models are methodologically justified in non-experimental research (Hernández & Mendoza, 2018) and have been widely implemented in studies of study habits and related academic variables (George-Reyes et al., 2023).

## Participants

A non-probability sampling method relying on voluntary participation was employed (Hernández & Mendoza, 2018; Mayorga & Ruiz, 2014). The sample comprised 273 students from the Technical University of Manabí (UTM), with 90% identifying as female. Participant ages ranged from 15 to 50 years ($M$ = 23.6, $SD$ = 6.40). The mean age was 23.7 years for female and 22.8 years for male.

## Measures

### *Study Environmental Conditions*

The variable was measured using nine items (e.g., Do you get adequate oxygenation, temperature and humidity when you study?) adapted from the Study Habits and Motivation to Learning Questionnaire developed by Carmen Oñate (2001), with validity of use for the Latin American context (Acevedo et al., 2015; Castro et al., 2009) to evaluate the availability of basic study conditions. Responses were recorded dichotomously (0 = *no* to 1 = *yes*). Internal consistency was assessed with the Kuder–Richardson 20 coefficient (KR-20), resulting in a value of .71, which is regarded as acceptable (Hair et al., 2019).

### *Motivation to Learn*

Motivation to learn was assessed using seven items (e.g., Do you consider that what you are studying is related to your interests?) from the Study Habits and Motivation to Learning Questionnaire developed (Oñate, 2001), with validity of use for the Latin American context (Acevedo et al., 2015; Castro et al., 2009).

Responses were collected on a dichotomous scale (0 = *never* to 1 = *always*), with higher scores reflecting greater autonomous motivation. The internal consistency of the scale, as measured by KR-20, was .63, which is considered acceptable for cultural context and research purposes (Hair et al., 2019; Mahdavi-Roshan et al., 2018).

### *Study Habits*

Students' study habits were measured using eight items (e.g., Do you have a more or less regular study schedule?) from Study Habits and Motivation for Learning Questionnaire developed (Oñate, 2001), with validity of use for the Latin American context (Acevedo et al., 2015; Castro et al., 2009). Items were answered dichotomously (0 = never, 1 = always), with higher scores reflecting more consistent study habits. The values of KR-20, was .71 (Hair et al., 2019).

## Statistical Analysis

No missing data was identified in the study. Descriptive statistics, including mean, standard deviation, skewness, and kurtosis, were calculated for all study variables. Associations between dichotomous variables were assessed using the phi (φ) coefficient. In accordance with the guidelines of David Funder and Daniel Ozer (2019), φ values of .10 were considered small effects, values of .20 or greater as moderate effects, and values of .30 or greater as large effects.

A multiple linear regression analysis was performed to determine whether age, sex, study environment conditions, and motivation to learn were associated with students' study habits. To assess potential multicollinearity among the predictors, variance inflation factor (VIF) and tolerance indices were calculated, adopting the conventional cut-off criteria of VIf < 5 and tolerance > .20 (Hair et al., 2019).

# Results

## Descriptive and Correlacional Analyses

Descriptive statistics showed that students exhibited high levels of motivation to learn, moderate study habits, and lower levels of supportive study environmental conditions. Analysis of distributional properties revealed substantial skewness and kurtosis for age and motivation to learn. In contrast, environmental conditions and study habits demonstrated less pronounced deviations from normality (see Table 1).

Phi coefficients revealed significant positive associations among study environment conditions, motivation to learn, and study habits. Additionally, point-biserial correla-

tions demonstrated that both age and sex were positively and significantly associated with motivation to learn, while no significant associations were identified with study habits.

Based on effect size guidelines (Funder & Ozer, 2019), the association between environmental conditions and motivation to learn was moderate. In comparison, the associations between environmental conditions and study habits, as well as between motivation to learn and study habits, were large (see Table 1).

**Table 1**

*Descriptive Statistics and Correlations Among Study Variables*

| Variable | M | SD | Skew | Kur | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|---|
| *1. Study environmental conditions* | 0.63 | 0.25 | -0.39 | -0.62 | - | .42*** | .51*** | -.03 | -.06 |
| *2. Motivation to learn* | 0.92 | 0.14 | -2.44 | 6.69 | | - | .56*** | .35*** | .14* |
| *3. Study Habits* | 0.54 | 0.27 | -0.18 | -0.89 | | | - | .09 | .07 |
| *4. Age* | 23.59 | 6.39 | 2.07 | 4.84 | | | | - | .04 |
| *5. Sex* | | | | | | | | | - |

*Note*. 0 = male, 1 = female; ***$p < .001$.

*Source.* Own research.

## Regression Analyses

Multicollinearity diagnostics indicated no evidence of collinearity concerns among the predictors. Tolerance values ranged from .96 to .98, well above the conventional cutoff of .20, and VIf values ranged from 1.01 to 1.03, far below the threshold of 5. These results suggest that the predictors were largely independent and that the regression coefficients were not affected by inflated standard errors due to multicollinearity.

The regression model accounted for a significant proportion of variance in study habits ($F = 13, 54$, $p < .001$; $R^2 = .16$). Being female was negatively associated with study habits, whereas study environment conditions and motivation to learn were positively associated with study habits. Among the predictors, motivation to learn showed the largest standardised coefficient, indicating that it was the strongest predictor of study habits. Age was not significantly associated with study habits.

**Table 2**

*Results of Regression Analysis for Variables Predicting Study Habits*

| Variable | B | SE B | β | t | p |
|---|---|---|---|---|---|
| Sex | -0.10 | 0.04 | -.11 | -2.04 | .042 |

| Variable | B | SE B | β | t | p |
|---|---|---|---|---|---|
| Age | 0.01 | 0.02 | .03 | 0.55 | .557 |
| Environmental conditions | 0.16 | 0.05 | .16 | 2.91*** | .004 |
| Motivation to learn | 0.77 | 0.13 | .35 | 5.98*** | < .001 |

*Note.* 0 = male, 1 = female; ***$p < .001$.
*Source.* Own research.

## Discussion

The results of the study partially support the hypotheses and reveal that study habits in higher education cannot be adequately explained by isolated sociodemographic variables, but rather emerge from a psycho-contextual architecture in which motivational and environmental factors play a central role. In general, it is shown that motivation for learning and study environment conditions have greater explanatory weight than age and gender, indicating that self-regulated academic behaviour is shaped primarily by psychological and contextual processes closer to academic performance than by static sociodemographic characteristics. This interpretation is consistent with the evidence synthesised by Leihong Wang and Zhonggen Yu (2023), who show that gender differences in academic variables are often mediated by motivational and self-concept factors, and with the findings reported by Zhihong Xu et al. (2023), who highlight that self-regulated learning strategies and environmental conditions have more consistent explanatory effects on academic outcomes in various educational contexts.

In relation to Hypothesis 1, age did not show a significant association with study habits, suggesting that the influence of age may be diluted when predictors more closely related to academic behaviour, such as motivation and self-regulation, are incorporated. Recent literature supports this interpretation, noting that demographic factors tend to have small or inconsistent effects when psychological resources such as self-efficacy, intrinsic motivation, and metacognitive strategies are controlled for (Cigde & Oncu, 2024; Xu et al., 2022). Similarly, Rebecca Kaedabi-Donkor et al. (2025) show that age-related differences in academic variables tend to diminish when motivational variables are incorporated into explanatory models. Therefore, the study's results reinforce the idea that study habits do not depend directly on maturation factors, but rather on more immediate psychological and contextual mechanisms that mediate academic behaviour.

Regarding Hypothesis 2, sex showed a small but significant negative association with study habits ($\beta = -.11$). Although the effect was statistically significant, its small magnitude indicates that it cannot be interpreted as a structural difference attributable to gender alone. Contemporary evidence suggests that gender differences in academic variables are often mediated or moderated by factors such as self-concept, motivation,

and self-efficacy, rather than by sex as an isolated variable (Wang & Yu, 2023). Likewise, recent studies in higher education show that gender variations in study behaviour and strategies are sensitive to context, disciplinary area, and specific academic demands (Aljaffer et al., 2024). In this sense, the effect described above should be interpreted within a multivariate framework, considering that gender may be capturing differential configurations of academic experiences, motivational resources, and contextual demands, rather than directly determining the consolidation of study habits.

Hypothesis 3 was confirmed. The conditions of the study environment were positively and significantly associated with study habits, both in the correlational analyses and in the regression model. This result is consistent with studies showing that environmental variables such as lighting, ventilation, ergonomics, and distraction control influence key cognitive processes such as concentration and persistence (Brink et al., 2021; Bustamante-Mora et al., 2025; Yang & Jeon, 2023). The results observed in the study suggest that the environment operates as a behavioural scaffold that facilitates the translation of academic intentions into systematic routines, providing structural conditions that support self-regulation (Litalien et al., 2024; Merikova, 2024).

Likewise, Hypothesis 4 was empirically supported. Motivation to learn showed a robust positive association with study habits and emerged as the predictor with the highest standardised weight in the model ($\beta = .35$). This finding is consistent with Self-Determination Theory (Ryan & Deci, 2020; Ryan & Vansteenkiste, 2023), which posits that motivation to learn promotes sustained engagement and internalisation of academic behaviour. When students perceive their studies as meaningful and aligned with their personal interests, they are more likely to establish stable routines and maintain persistent efforts. These results also converge with research highlighting the central role of self-regulated learning in academic performance (David et al., 2024; Svartdal et al., 2021; Zimmerman, 2002).

Although motivation showed the highest standardised coefficient, environmental conditions retained a significant contribution, underscoring the complementary nature of both factors. The model explained 16% of the variance in study habits. Although this percentage may be considered moderate, it is consistent with the inherent complexity of academic behaviour, which is determined by multiple individual dimensions such as self-determined motivation, the study context that facilitates organisation, planning, and self-regulation of learning (Biwer et al., 2020; David et al., 2024; Funder & Ozer, 2019; Svartdal et al., 2021). In this sense, the explained variance supports the relevance of simultaneously integrating motivational and contextual factors in understanding study habits.

Additionally, the positive association between environmental conditions and motivation to learn demonstrates a structural interdependence between context and motivational disposition, rather than a simple coexistence of factors. According to Richard M. Ryan and Edward L. Deci (2020), structured and functional environments not only optimise the physical conditions for study, but also facilitate the satisfaction of basic

psychological needs, particularly competence and autonomy, promoting more internalised and self-determined forms of academic regulation. However, the moderate magnitude obtained in this relationship indicates that motivation is not explained solely by environmental quality; rather, intrinsic dispositions, self-efficacy, and cognitive commitment continue to be determinants in the activation and persistence of academic behaviour (Luo et al., 2023; Mappadang et al., 2022). Thus, motivation is necessary but insufficient to consolidate study habits, whose stabilisation requires contextual conditions that reduce friction and sustain planning and attention over time, as evidenced by Bukola Adewale et al. (2021) and Ma. Janice Gumasing et al. (2023).

Overall, the findings support an integrative perspective on study habits, understood as behavioural patterns that emerge from the accommodation between internal motivational resources and external structural conditions. In line with Self-Determination Theory and models of academic self-regulation (Ryan & Deci, 2020; Zimmerman, 2002), the consolidation of academic routines does not depend exclusively on motivational intention or the physical environment, but on the convergence of both: motivation guides and energises behaviour, while the context enables its stable repetition until it becomes a habit (David et al., 2024).

## Partial Implications

From an applied perspective, the study results indicate that interventions aimed at strengthening study habits in higher education should adopt a comprehensive approach that explicitly articulates motivational factors and contextual learning conditions. The findings show that, although motivation to learn is a relevant predictor, its impact on the consolidation of stable habits is enhanced when students have adequate environmental conditions for study.

In this regard, it is pertinent for higher education institutions to promote physical and organisational environments that facilitate concentration, planning, and academic persistence, such as functional, ergonomic study spaces with control over distractions. Likewise, the results suggest the importance of guiding students in the strategic management of their own learning environments, particularly in hybrid or virtual modalities, where the quality of the study space depends to a greater extent on individual self-regulation.

Complementarily, the findings support the design of training programmes that integrate the development of self-regulation skills, time planning, and strategic use of the environment as central components of university learning. Such interventions could help translate motivational disposition into consistent academic routines, reducing contextual friction and strengthening the behavioural stability associated with study habits.

## Limitations of the Study

Despite the results achieved, several limitations of the study must be considered. First, the cross-sectional and non-experimental design prevents causal inference. Although regression analysis allows for the estimation of statistical predictive relationships, the directionality between environmental conditions, motivation to learn, and study habits cannot be established. Therefore, it is not possible to determine whether favourable environments improve motivation and habits, whether motivated students structure their environments more effectively, or whether reciprocal effects occur over time. Longitudinal and experimental designs would therefore be necessary to clarify these temporal and causal dynamics.

Second, the study relied exclusively on self-report measures, which may introduce common method variance and biases related to social desirability or subjective perception. While self-report instruments are widely used in research on motivation and study habits, they may inflate associations between variables measured within the same response format. In this regard, future research should incorporate multi-method approaches, including behavioural indicators (e.g., recorded study time, environmental monitoring measures), observational assessments, or academic performance records, to triangulate findings and reduce potential measurement bias.

Third, the model explained 16% of the variance in study habits, indicating that other unmeasured variables likely contribute to their development. Factors such as academic self-efficacy, personality traits, cognitive strategies, institutional support, or socioeconomic conditions could further explain the variability in study behaviour. Expanding the explanatory model would allow for a more comprehensive understanding of the multilevel determinants of academic self-regulation.

Finally, the sample was drawn from a single higher education institution, which limits the generalisability of the findings. Institutional culture, disciplinary distribution, and socioeconomic context can influence both environmental conditions and motivational profiles. Future studies should replicate the model across different universities, academic fields, and educational modalities to test the robustness and intercontextual stability of the observed relationships.

# Conclusions

The study's findings show that study habits in higher education cannot be explained solely by motivational disposition or contextual conditions in isolation, but rather by their combined contribution. Motivation to learn proved to be the strongest predictor of study habits, while environmental conditions also contributed significantly to their explanation, demonstrating the complementary role of psychological and contextual factors in the consolidation of such academic routines.

However, age did not show a significant independent association with study habits, while gender showed a small effect, suggesting that study behaviour is influenced more by motivational and environmental processes in the context than by static sociodemographic characteristics. Therefore, the configuration of academic self-regulation seems to depend mainly on modifiable psychological resources and contextual possibilities, rather than on sociodemographic attributes.

Overall, the findings support an integrative perspective in which the stabilisation of study habits results from the alignment between motivational energy and the environmental conditions of the study environment. This evidence highlights the importance of designing comprehensive institutional and pedagogical strategies that simultaneously strengthen motivation to learn and improve study conditions to foster consistent and sustainable academic behaviour

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