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LEARNING STRATEGIES AND INCLUSION: FIRST-YEAR ENGAGEMENT WITH A 'LEARNING TO LEARN' MODULE

ESTRATÉGIAS DE APRENDIZAGEM E INCLUSÃO: PARTICIPAÇÃO DE ALUNOS DO PRIMEIRO ANO EM UM MÓDULO "APRENDER A APRENDER"

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Abstract
This study investigates the study practices and inclusion challenges of first-year undergraduates at a public university in Peru. It examines the use of learning strategies, their determinants, and student engagement with a remedial Learning to Learn module. Surveying 200 students from four academic programmes (two in Social Sciences and two in Sciences), the research employed descriptive and inferential analyses, including chi-square tests and regression models. Results reveal that students predominantly relied on lower-utility strategies such as rereading, highlighting, and note-taking, while the adoption of higher-utility strategies—such as elaboration, self-testing, and spaced practice—was limited. Gender and disciplinary field emerged as consistent predictors of study practices, with female students and those in Sciences reporting broader and more effective strategy repertoires. Motivation also played a crucial role: intrinsic motivation fostered, while amotivation constrained, the use of diverse and effective strategies. Difficulties in initiating tasks were widespread, reported by 54% of students, particularly males and those with lower self-perceived academic competence. Participation in the Learning to Learn module was modest, with only 27% attending any session and 21% completing it. Overall, the findings underscore the need to embed evidence-based study skills

Resumo
Este estudo investiga as práticas de estudo e os desafios de inclusão de estudantes do primeiro ano de graduação em uma universidade pública no Peru. Examina o uso de estratégias de aprendizagem, seus determinantes e o engajamento dos estudantes com um módulo de recuperação de Aprendizagem para Aprender. A pesquisa, que entrevistou 200 estudantes de quatro programas acadêmicos (dois em Ciências Sociais e dois em Ciências), utilizou análises descritivas e inferenciais, incluindo testes qui-quadrado e modelos de regressão. Os resultados revelam que os estudantes se basearam predominantemente em estratégias de menor utilidade, como releitura, destaque e anotações, enquanto a adoção de estratégias de maior utilidade – como elaboração, autoavaliação e prática espaçada – foi limitada. Gênero e área disciplinar emergiram como preditores consistentes das práticas de estudo, com estudantes do sexo feminino e aquelas em Ciências relatando repertórios de estratégias mais amplos e eficazes. A motivação também desempenhou um papel crucial: a motivação intrínseca fomentou, enquanto a desmotivação restringiu, o uso de estratégias diversas e eficazes. Dificuldades em iniciar tarefas foram generalizadas, relatadas por 54% dos alunos, particularmente os do sexo masculino e aqueles com menor autopercepção de competência

instruction within first-year curricula and to design inclusive, programme-integrated support systems.

Keywords: Educational Equality. Effective Learning Strategies. First-Year Undergraduates. ‘Learning To Learn’ Module. Remedial Education.

acadêmica. A participação no módulo Aprender a Aprender foi modesta, com apenas 27% participando de alguma sessão e 21% concluindo-a. No geral, os resultados ressaltam a necessidade de incorporar o ensino de habilidades de estudo baseadas em evidências nos currículos do primeiro ano e de elaborar sistemas de apoio inclusivos e integrados ao programa.

Palavras-chave: *Igualdade Educacional. Estratégias Eficazes de Aprendizagem. Alunos do Primeiro Ano de Graduação. Módulo "Aprender a Aprender". Educação Reparadora.*

1 INTRODUCTION

The low level of completion of university degrees in Peru remains a structural challenge for the national higher-education system. According to the Organisation for Economic Co-operation and Development {OECD} (2025), only 20% of young Peruvians complete higher education, placing the country below the Latin-American regional average. This situation is compounded by low progression to the second year and persistent structural barriers relating to student retention, academic support, and equitable access to public higher education (Organización de Estados Iberoamericanos para la Educación, la Ciencia y la Cultura [OEI], Observatorio Iberoamericano de la Ciencia, la Tecnología y la Sociedad [OCTS], & Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura [UNESCO], 2023). Several studies emphasise that the first year is critical for preventing dropout and fostering successful academic trajectories (Carranza et al., 2022).

International research shows that study practices are strongly mediated by individual, academic, and motivational factors (Dunlosky et al., 2013; Viau, 2009). In Latin America, Casali-Turpo et al. (2024) report that active strategies—such as self-testing and distributed planning—enhance performance among Peruvian students, yet lower-utility techniques like passive rereading and mechanical highlighting remain dominant. Similarly, Carranza et al. (2022) find that low intrinsic motivation undermines the development of autonomous study habits.

Despite these insights, many studies face methodological limitations that constrain national applicability: they target specific programmes, rely on small samples

or omit multivariable interactions. Three main gaps can be identified: (a) a lack of studies addressing study practices from an integrated, multivariable perspective; (b) scarce evidence on the effectiveness of remedial programmes such as 'Learning to Learn'; and (c) limited understanding of how socio-demographic, motivational and academic variables interact to shape practice.

While some research highlights the benefits of such remedial programmes for first-year adaptation, other studies question their long-term effectiveness or report inconsistent results depending on context, implementation quality, and student profiles (Burgess, 2025; Jacobs et al., 2025). These divergences justify further empirical work that considers the institutional–individual interplay.

In Peru, the 'Learning to Learn' module has been increasingly adopted within inclusion and retention policies to foster metacognitive awareness and self-regulated learning among first-year students. Its promise lies in bridging study-skills gaps among under-prepared entrants, many from under-resourced schools; however, national evidence on its uptake and effectiveness remains scarce.

Accordingly, this study examines (i) the study practices most frequently used by first-year undergraduates in Peruvian public institutions, (ii) factors associated with the adoption of higher-utility learning strategies, and (iii) variables influencing participation in a remedial Learning to Learn programme. We hypothesise that institutional support has not yet led to broad diversification of practices; that the use of higher-utility strategies is linked to socio-demographic and motivational variables; and that individual characteristics (e.g., academic background, prior exposure to self-regulation) condition engagement with remediation initiatives.

Briefly, the study finds that students predominantly rely on lower-utility techniques; intrinsic motivation and disciplinary context are associated with broader, more effective repertoires; and participation in the remedial programme is modest and shaped by programme-level integration—findings elaborated in the Results and Discussion.

2 THEORETICAL FRAMEWORK

2.1 Study practices and effective learning strategies

For many first-year undergraduates, entering university entails a profound academic and psychosocial transition. Coulon (2005) characterises this process as a 'psycho-pedagogical rupture', in which students must learn the 'profession of being a student'. This transition involves adjusting to unfamiliar behavioural, social, and academic expectations, including time management, independent study and the use of structured learning strategies.

These strategies—commonly referred to as study techniques, learning methods, or cognitive tools—are understood as organised, intentional, and adaptive behaviours that facilitate the acquisition and retention of academic content (Panadero, 2017). Over recent decades, cognitive psychology has expanded understanding of the mental functions underpinning effective learning, including attention, reasoning, memory, and metacognitive regulation (Bannert, 2021; Dunlosky & Rawson, 2015). Hattie and Donoghue (2016), notably, propose a staged model categorising strategies across surface, deep, and transfer phases, emphasising that the effectiveness of each strategy depends on the stage of learning.

Despite this growing evidence base, empirical studies consistently show that students seldom adopt higher-utility strategies spontaneously. Instead, they often rely on familiar familiar but less effective techniques—such as rereading and highlighting—that offer only modest gains in long-term retention (Karpicke et al., 2009). Two broad explanations have been proposed. First, contextual constraints such as time pressure, assessment formats, and workload lead students to select strategies based on convenience rather than efficacy (Blasiman et al., 2017). Second, many students have not received explicit instruction on the benefits and proper application of effective strategies (Kornell & Bjork, 2007; McCabe, 2011). For example, McCabe (2011) found that undergraduates frequently overestimated the usefulness of suboptimal techniques, suggesting a reliance on intuition and habit rather than informed decision-making.

In Latin American contexts, these challenges are intensified by structural and pedagogical limitations. Recent regional research indicates that first-year students—particularly those from disadvantaged backgrounds—often lack prior exposure to

strategic learning behaviours and enter higher education without having developed self-regulatory habits during secondary school (Lagubeau et al., 2020). Furthermore, Pérez-González et al. (2022) highlight the role of individual differences in self-regulated learning as key predictors of academic performance throughout multi-year programmes. These findings reinforce the need to adapt insights from cognitive science to the institutional and sociocultural realities of Latin American universities, ensuring that strategic learning support is both accessible and contextually relevant.

Taken together, this subsection supports Hypothesis 1: despite institutional support, first-year students predominantly rely on lower-utility strategies, and the diversification of study practices remains limited.

2.2 Support mechanisms in undergraduate programmes

Given persistently high failure and dropout rates during the first year of university study (Tinto, 2017), enhancing student retention through structured support has become a priority for higher education institutions worldwide. In Latin America—particularly in Peru and Chile—universities have introduced a range of institutional mechanisms, such as tutoring schemes, orientation modules, and embedded academic support, to promote academic integration and reduce early attrition (Cavagnoud & Ames, 2024).

In Peru, Cavagnoud and Ames (2024) studied scholarship recipients during the COVID-19 and found that academic support, particularly when combined with financial assistance, was vital to student persistence. Their qualitative study with 60 participants illustrated how institutional interventions complemented personal and familial resilience. In Chile, Lagubeau et al. (2020) found that large-scale active-learning strategies implemented in introductory physics courses significantly reduced failure rates, especially among students with weaker formal reasoning skills. These findings suggest that pedagogically embedded approaches can improve outcomes for underprepared students.

Nonetheless, several studies report that support initiatives often benefit those who are already self-regulated and motivated, while more vulnerable students are less likely to engage. Recent meta-analytic evidence confirms this concern: unless interventions are deliberately designed to reach high-risk groups, they risk reproducing existing inequalities in student success (Koçoğlu & Haidari, 2025).

Factors such as student engagement and perceived stigma can shape the effectiveness of academic support. In Chile, students from disadvantaged backgrounds often avoided remedial programmes due to concerns about being labelled as underperforming (Lagubeau et al., 2020). Moreover, integration into the curriculum appears crucial: support programmes embedded within disciplinary modules tend to yield more sustained academic benefits than standalone workshops (Cavagnoud & Ames, 2024; Koçoğlu & Haidari, 2025).

Despite ongoing reforms—including Chile's MECESUP programme, which has strengthened academic infrastructures—rigorous longitudinal evaluations of support initiatives in Latin America remain scarce. Critical analyses warn that without proactive outreach and pedagogical approaches tailored to students' needs, institutional efforts may fall short of their equity goals (Cavagnoud & Ames, 2024; Koçoğlu & Haidari, 2025).

In summary, although academic support mechanisms are expanding across the region, their effectiveness remains uneven. Success depends not only on structural availability but also on thoughtful design, curricular integration, and sustained engagement with the students who need them most. These considerations underpin Hypothesis 2 (H2): participation in the remedial programme is shaped primarily by structural and organisational factors—such as programme-level integration and timetabling—rather than by background characteristics such as socio-economic status or housing.

2.3 The importance of motivation in the first year of university

Motivation is a well-established predictor of academic success among first-year undergraduates. Central to this literature is Self-Determination Theory (SDT), which proposes a continuum ranging from intrinsic motivation to extrinsic motivation (identified and external regulation), and amotivation (Ryan & Deci, 2000). Intrinsically motivated students engage with academic tasks out of interest and perceived value, whereas extrinsically motivated peers respond to external contingencies. In contrast, amotivation reflects a lack of perceived contingency between effort and outcomes and is frequently linked to disengagement.

Recent Latin American confirm these dynamics. Carranza et al. (2022) validated the Research Motivation Scale with over 2,200 Peruvian students, showing that intrinsic

motivation strongly predicts academic engagement and correlates positively with self-regulatory behaviours, while amotivation is associated with lower use of support services. Similarly, Bustamante-Mora et al. (2023), in a study of engineering students across several Latin American universities, found that perceived competence and autonomy-supportive learning environments enhance intrinsic motivation, which in turn fostered deeper learning strategies.

At a broader level, a recent meta-analysis of SDT interventions in higher education (Wang et al., 2024) concluded that satisfying students' needs for autonomy, competence, and relatedness consistently improves academic engagement and well-being, with moderate to large effect sizes. Motivation also mediates the relationship between background and engagement: students from under-resourced schools in Peru tend to report lower self-determined motivation, which correlates with less frequent use of effective learning strategies (Carranza et al., 2022).

In sum, autonomous forms of motivation—whether intrinsic or based on identified regulation—are linked to deeper learning, stronger self-regulation, and improved academic performance, whereas amotivation is associated with disengagement and poorer outcomes. Motivation thus functions as a critical mechanism connecting individual characteristics to study behaviours and engagement with support systems.

These insights carry clear implications for practice in Latin American universities. Strategies that foster intrinsic and autonomous motivation—such as autonomy-supportive teaching, mentoring, and formative feedback—are likely to encourage students to adopt more effective learning strategies throughout their first year, especially among under-represented and disadvantaged populations.

Taken together, this subsection supports Hypothesis 3 (H3): students with higher intrinsic motivation (and lower amotivation) are expected to display a broader repertoire of study practices and fewer difficulties initiating academic tasks.

3 MATERIALS AND METHODS

3.1 Questionnaire-based survey (design, setting, participants, procedure)

We conducted a questionnaire-based study at the beginning of the academic year with 200 first-year students enrolled in four Education programmes at a public Peruvian

university—two Social Sciences programmes and two Science programmes—selected to reflect disciplinary diversity within a representative public university context. Paper-based surveys were administered in class during induction activities to maximise participation.

Inclusion criteria were: (i) enrolment as a first-year undergraduate in one of the four programmes, and (ii) attendance at the induction session. Questionnaires with more than 20% missing responses were excluded. Participation was voluntary and anonymous, and written informed consent was obtained prior to data collection.

3.2 Measures and adaptation/validation

We assessed study practices with using 29 items adapted from the MSLQ and cognitive strategy research, aligned with evidence on higher- and lower-utility techniques (Dunlosky et al., 2013; Pintrich et al., 1993). The instrument was translated into Spanish, reviewed by experts for contextual relevance, and piloted with 15 first-year students; minor wording adjustments were made accordingly.

Responses were recorded on a five-point Likert scale (1 = "never" to 5 = "always"). All 29 items are listed in Table 2. Two indices were constructed for the analyses in Section 4: a study practices score (sum of 29 items; range = 29–145) and an effective-techniques score (sum of five higher-utility items: self-testing, elaboration/self-explanation, question generation/self-questioning, interleaving/variation, spaced practice; range = 5–25).

Internal consistency (Cronbach's α) for the multi-item scales is reported in Section 4 (see also Morais et al., 2025,for related adaptation/validation work).

Motivational orientation was assessed using the Situational Motivation Scale (SIMS), which captures intrinsic motivation, identified regulation, external regulation, and amotivation on a seven-point scale (1–7) (Guay et al., 2000). The Spanish version followed the same process of translation, expert review, and piloting to ensure conceptual equivalence and response-process validity. Subscale means were computed and used as continuous predictors in the multivariate models presented in Section 4.

Students also reported common study-related difficulties and the number of weekly hours dedicated to out-of-class study. Additionally, the use and perceived effectiveness of ten learning techniques were recorded, following the higher-/lower-

utility taxonomy (Dunlosky et al., 2013). A global self-rating of academic performance was also collected. Institutional records provided complementary sociodemographic and academic variables to triangulate self-reports and support the multivariate analyses (Cerezo et al., 2019).

3.3 'Learning to Learn' module (intervention and participation coding)

At the beginning of the academic year, students were offered a remedial support module comprising a two-hour lecture on key principles of cognitive functioning and study strategies for successful transition to university, followed by five two-hour tutorials delivered on a fortnightly basis. Each tutorial combined a brief conceptual introduction with practical exercises and take-home materials, aiming to strengthen autonomous and strategic approaches to learning. The content, duration, and delivery format were kept constant across all sessions. Attendance was recorded using sign-in sheets completed by students at the start of each session.

Participation in the module was operationalised in three ways: first, a binary indicator capturing whether the student attended at least one session (either the lecture or any tutorial); second, a count of the total number of sessions attended; and third, a binary indicator for full completion, defined as attending both the lecture and all five tutorials. Session topics are summarised in Table 1. Descriptive statistics related to attendance and completion are reported in Section 4.3.1, and predictive models are presented in Tables 8 and 9.

Table 1. Content of the 'Learning to Learn' Module Sessions

Session	Topic	Focus
Lecture	Learning How to Learn	Key principles of cognitive functioning; the four pillars of learning.
Tutorial 1	Getting Organised	Distributed and varied practice; planning revision with multiple techniques.
Tutorial 2	Focusing Attention	Definition of attention; sources of distraction; attentional control, strategies to manage distractions.
Tutorial 3	Getting Involved	Active engagement in learning; asking questions; elaboration techniques.
Tutorial 4	Consolidating	Developing automaticity to free cognitive resources; extended practice; testing effect; spaced retrieval.
Tutorial 5	Staying Motivated	Types and sources of motivation; feedback; self-esteem.

Note. Each tutorial session addressed a specific aspect of self-regulated learning, combining theoretical input with applied strategies. Source: Authors

All sessions followed the same pedagogical structure, and the content, duration, and delivery format were held constant across tutorials. Attendance was recorded using sign-in sheets maintained by the course staff. For analysis purposes, participation was coded according to the three categories previously described.

3.4 Statistical analyses

All statistical analyses were conducted using IBM SPSS Statistics 29 (IBM Corp., Armonk, NY). Descriptive statistics were used to summarise the characteristics of the sample and the item-level frequencies for the study practices. Differences between groups in the frequency of individual study practices were examined using Pearson's chi-squared (χ^2) tests.

Linear regressions models were employed to identify the predictors of two composite scores: the study practices score and the effective-techniques score. Results are reported using standardised beta β coefficients, two-tailed significance level ($\alpha = .05$), and model R^2 values. Assumptions of linear regression—normality of residuals, homoscedasticity, and multicollinearity (variance inflation factor < 5) — were tested and met.

Binary logistic regressions modelled (i) difficulty getting started with work and (ii) participation at least once in the module. We report odds ratios (Exp(B)) and Nagelkerke R^2 with 95% confidence intervals. Reference categories match Section 4: Male (gender), Social Sciences (programme), Disadvantaged (socio-economic status), Other (housing), Not first-time entrant, Low self-perceived academic level.

Missing data represented less than 5% of cases across variables and were addressed using listwise deletion following verification of approximate randomness. A sensitivity analysis using mean imputation for missing values on scale items produced substantively similar results; these are available upon request.

3.5 Ethical considerations

The study adhered to the principles of the Declaration of Helsinki and complied with the institutional regulations of a public university in Peru. In accordance with institutional policy, formal ethical approval was not required, as the study involved an

anonymous questionnaire, did not collect sensitive personal data, and entailed no more than minimal risk to participants. All students were fully informed of the study's aims and procedures and provided voluntary written informed consent prior to data collection. All data were de-identified before analysis to ensure anonymity and confidentiality.

3.6 Materials, data, and code availability

Although the questionnaire, codebook, and analysis syntax were developed as part of this study, they are not included as supplementary materials due to institutional restrictions on the public sharing of instructional and evaluation tools. Furthermore, the de-identified dataset is not available to protect participant confidentiality and to avoid the risk of re-identification in small programme-level subgroups. Researchers interested in accessing the materials for replication or educational purposes may contact the corresponding author.

4 RESULTS

4.1 Characteristics and study practices of the sampled students

4.1.1 Social and academic characteristics

The sample comprised 200 first-year undergraduates enrolled in four academic programmes in Education at a public university in southern Peru: 65.5% in Programme in Social Sciences Programmes and 34.5% in Sciences Programmes. Female students represented made up (64%) of the sample, while male students accounted for 36%.

Regarding parental socio-economic status (SES), 37% came from advantaged households, 33% from middle-status families, and 22% from disadvantaged backgrounds, based on parental occupation and education. Housing conditions showed that 52% lived with parents, 26% in their own accommodation, and 22% in other arrangements (e.g., with relatives, shared rentals). The average age was 19 years, and all participants entered university directly after secondary school.

4.1.2 Students' study practices

We analysed 29 items grounded in cognitive psychology and self-regulated learning research (Dunlosky & Rawson, 2015; Panadero, 2017), which highlight the benefits of strategies such as elaboration, self-testing, and time management. These items were drawn and adapted from validated instruments on learning strategies and motivational profiles. An item-level approach, rather than composite scoring, was adopted to capture specific behavioural patterns among first-year students.

Table 2. Proportion of students in the sample (N = 200) reporting frequent use of study practices ("most of the time" or "always")

Study Practice	Percentage of students (%)
Attend lectures	98.0
Read slowly when content is difficult	83.7
Organise notes	76.8
Record academic dates in a planner	75.1
Highlight or underline key content	74.3
Ask classmates for explanations	72.4
Review course content after incorrect answers	70.4
Rephrase content for explanation	68.3
Include visuals in notes (figures, tables, graphs)	67.8
Explain problems using course content	64.7
Review and complete notes after class	58.8
Revise chapter after lectures	57.4
Make connections between course readings and tutorials	56.6
Divide content into manageable sections	52.4
Estimate study time needed	50.2
Use past exams or practice tests	49.9
Vary study strategies (e.g., reading, writing, problem-solving)	46.8
Review chapters before starting study sessions	44.3
Create own examples	42.6
Take practice tests without notes	42.0
Explain concepts to peers	40.7
Analyse textbook visuals	40.2
Ask lecturers for clarification	35.4
Create a revision timetable	33.8
Adapt revision for multiple-choice exams	33.1
Take notes while reading	32.7
Generate and answer own questions while reading	32.1
Cram before exams	26.7
Request additional materials from lectures	8.6

Note. Associations between study practices and gender, programme of study, housing type, and first-time entrant status were examined using chi-squared tests. SES = socio-economic status, based on parental occupation and education.
Source: Authors

Students reported frequent use of surface-level strategies, particularly attending lectures (98.0%), reading slowly when content was difficult (83.7%), organising notes (76.8%), and highlighting key content (74.3%). These behaviours were especially prevalent among female students and those enrolled in Social Sciences programmes. Conversely, more cognitively demanding practices—such as elaboration, planning, and self-testing—were used less frequently generating questions, creating revision timetables, or taking practice tests without notes were each reported by fewer than half of the students.

Chi-squared tests indicated that attendance—nearly universal and plausibly influenced by the timing of the survey during in-person induction—was significantly higher among female students ($\chi^2 = 16.37$, $p < .01$) and first-time entrants ($\chi^2 = 31.60$, $p < .01$). Reading slowly when content was difficult (83.7%) was also more common among female students ($\chi^2 = 20.67$, $p < .01$). Organising lecture notes (76.8%) was significantly more prevalent among female students ($\chi^2 = 86.98$, $p < .01$), first-time entrants ($\chi^2 = 14.49$, $p < .01$), and Social Sciences students ($\chi^2 = 48.34$, $p < .01$). Recording academic deadlines in a planner (75.1%) was more common among female students ($\chi^2 = 48.68$, $p < .01$), and highlighting (74.3%) was more frequent among female students ($\chi^2 = 145.45$, $p < .01$) and Social Sciences students ($\chi^2 = 56.21$, $p < .01$).

By contrast, some practices were rarely reported. Only 8.6% of students requested additional materials from lecturers, although this was more common among Science students ($\chi^2 = 20.14$, $p < .01$) and first-time entrants ($\chi^2 = 13.69$, $p < .01$). Cramming (26.7%) was significantly more frequent among male students ($\chi^2 = 16.62$, $p < .01$); generating and answering one's own questions while reading (32.1%) was more often reported by male students ($\chi^2 = 19.76$, $p < .01$) and Science students ($\chi^2 = 17.12$, $p < .01$); adapting revision to multiple-choice formats (33.1%) was more common among female students ($\chi^2 = 11.25$, $p < .05$) and students living alone ($\chi^2 = 17.45$, $p < .05$); and creating a revision timetable (33.8%) was more prevalent among female students ($\chi^2 = 26.89$, $p < .01$).

To complement the item-level analysis, a composite study practices score was calculated by summing responses across all 29 items (Likert 1 = "never" to 5 = "always"). Scores ranged from 46 to 135, with a mean of 100 (SD = 14), suggesting that, on average, students frequently engaged in a broad range of practices.

These results reveal a heterogeneous pattern: familiar, surface-level strategies (e.g., attending lectures, highlighting, organising notes) are widely adopted, whereas more effective techniques—elaboration, planning, self-testing—remain underused. The persistent influence of gender and programme aligns with findings in Latin American contexts (Carranza et al., 2022).

4.2 Study of the determinants of study practices

The analysis in Section 4.1 showed heterogeneous patterns in students' study practices. While familiar strategies—such as attending lectures, highlighting content, and organising notes—were widely adopted, techniques involving elaboration, planning, and self-testing showed lower uptake. Differences by gender and academic programme were also apparent. Building on these patterns, this section examines how motivational, contextual, and background factors relate to the diversity of study practices using multivariate modelling.

4.2.1 Diversity of study practices

We estimated linear regression models with the composite study practices score as the dependent variable and students' characteristics as predictors. Model 1 included socio-demographic and educational variables; Model 2 additionally incorporated intrinsic motivation; Model 3 replaced intrinsic motivation with amotivation.

Table 3. Effect of Student Characteristics and Motivation on Study Practices Score

		Standardised β Coefficient		
Reference variable	**Active variable**	**Model 1**	**Model 2**	**Model 3**
Programmes of Study	Sciences vs. Social Sciences	0.093*	0.140***	0.088*
Gender	Female vs. Male	0.288***	0.248***	0.269***
Socio-economic status (SES)	Advantaged vs. Disadvantaged	0.039 ns	0.025 ns	0.040 ns
	Middle vs. Disadvantaged	0.009 ns	0.005 ns	0.012 ns
Type of housing	Own vs. Other	0.024 ns	0.022 ns	0.025 ns
	Parental vs. Other	0.037 ns	0.043 ns	0.046 ns
First-time entrant	Yes vs. No	0.020 ns	0.016 ns	0.015 ns
Self-perceived academic level	Good vs. Low	0.258***	0.197***	0.244***
Intrinsic motivation	—	—	0.316***	—
Amotivation	—	—	—	-0.150***

Model R^2	9.6%	23.5%	17.3%

Note. Standardised β coefficients. Predictors are dummy-coded with the following reference categories: Social Sciences (programme), Male (gender), Disadvantaged (SES), Other (housing), Not first-time entrant (entry status), and Low (Self-perceived academic level). Model R^2 reported for each specification. ***p < .01; **p < .05; *p < .10; ns = not significant.
Source: Authors

Gender showed a strong and consistent association with the diversity of study practices: female students scored higher than male students when controlling for other variables. Field of study also played a role: students in Science Programmes reported a broader repertoire of study practices compared to those in Social Sciences programmes. Self-perceived academic level was positively associated with diversity of practices (good vs. low).

Model R^2 was 9.6% in Model 1 and increased to 23.5% with the inclusion of intrinsic motivation (Model 2). Replacing intrinsic motivation with amotivation (Model 3) yielded a slightly lower explanatory power (17.3%). As Models 2 and 3 are non-nested specifications, the differences in R^2 are descriptive and should not be interpreted as direct trade-offs.

By contrast, socio-economic status, housing type, and first-time entrant status were not statistically significant in any model.

4.2.2 Difficulties encountered by students

We examined the extent to which students reported specific difficulties related to their learning strategies (Table 4).

Table 4. Distribution of Students in the Sample (N = 200) According to the Difficulties Encountered (in %)

Difficulty	**% Students**
Using your notes	4.3
Taking an interest in the course	8.2
Understanding theory and concepts	9.3
Understanding course-related applications/exercises	9.4
Grasping the course structure	10.4
Making connections with prior knowledge	11.4
Understanding subject-specific vocabulary	15.4
Taking notes during lectures (structure, legibility)	17.2
Selecting important ideas from the course	19.5
Going beyond rote memorisation	20.7
Revising other than by rereading	29.0

Difficulty	% Students
Conducting research in the library	37.5
Concentrating	38.9
Estimating study time needed per subject	45.4
Getting started with work	54.3

Note. Percentages reflect students who reported each difficulty "most of the time" or "always".
Source: Authors

Over half of the students reported difficulty getting started with work. We therefore estimated logistic regression models—including programme, gender, SES, housing, first-time entrant status, Self-perceived academic level, intrinsic motivation and amotivation—to asses the likelihood of reporting this difficulty (Table 5).

Table 5. Probability of a Student Encountering Difficulties in Getting Started with Work (odds ratios, Exp(B))

		Exp(B)	
Reference Variable	**Active Variable**	**Model 1**	**Model 2**
Programmes of Study	Sciences vs. Social Sciences	0.780 ns	0.308 ns
Gender	Female vs. Male	0.553 ***	0.559 ***
socio-economic Status (SES)	Advantaged vs. Disadvantaged	1.281 ns	1.224 ns
	Middle vs. Disadvantaged	0.791 ns	0.747 ns
Type of Housing	Own vs. Other	0.840 ns	0.822 ns
	Parental vs. Other	1.123 ns	1.057 ns
First-time entrant	Yes vs. No	0.728 ns	0.710 *
Self-Perceived Academic level	Good vs. Low	0.473 ***	0.444 ***
Intrinsic motivation	—	—	0.940 ***
Amotivation	—	—	1.083 ***
Nagelkerke R^2		10.8%	12%

Note. Odds ratios (Exp(B)). Reference categories: Social Sciences (programme), Male (gender), Disadvantaged (SES), Other (housing), Not first-time entrant (entry status), and Low (Self-perceived academic level). Nagelkerke R^2 reported for each specification. ***p < .01; **p < .05; *p < .10; ns = not significant.
Source: Authors

In the logistic models, female students and those who self-assessed their academic level as good were significantly less likely to report difficulty initiating academic work. First-time entrants also showed a marginally reduced likelihood ($p < .10$). Higher intrinsic motivation was associated with lower odds of reporting this difficulty, whereas amotivation increased the odds. The Nagelkerke R^2 ranged from 10.8% to 12.0%.

4.2.3 The use of effective study practices

We assessed study practices in terms of their pedagogical utility, grouping techniques into high- and low-utility categories.

Table 6. Distribution of Students in the Sample (N = 200) According to Their Use of the Proposed Learning Techniques (in %)

Learning Technique Category	Learning Technique	% of Students
Less effective	Rereading	82.9%
	Highlighting/underlining	70.8%
	Writing summaries	67.2%
	Using mnemonic devices	64.1%
	Visual imagery	58.9%
More effective	Taking self-tests	47.2%
	Generating questions	44.6%
	Explaining content aloud	40.9%
	Varying learning strategies	40.8%
	Applying spaced practice	27.9%

Note. Percentages reflect frequent use ("most of the time" or "always"). Category allocation follows the high-/low-utility distinction used in the study.
Source: Authors

Students demonstrated a clear preference for lower-utility strategies (e.g., rereading and highlighting). Fewer than half reported using self-testing or question generation. To quantify adoption of high-utility techniques, we computed a composite score (0–25) by summing the five recommended practices; higher scores indicate greater alignment with evidence-based learning. The mean score was 17.2 (SD = 3.6; range = 5–25).

We then modelled determinants of this score.

Table 7. Effect of Student Characteristics on Use of Effective Learning Techniques

		Standardised B coefficient	
Reference Variable	**Active Variable**	**Model 1**	**Model 2**
Programmes of Study	Sciences vs. Social Sciences	-0.020 ns	-0.068 ns
Gender	Female vs. Male	0.162 ***	0.178 ***
Socio-economic status (SES)	Advantaged vs. Disadvantaged	-0.026 ns	-0.022 ns
	Middle vs. Disadvantaged	-0.005 ns	-0.008 ns
Type of housing	Own vs. Other	-0.013 ns	-0.013 ns
	Parental vs. Other	0.063 ns	0.068 ns
First-time entrant	Yes vs. No	-0.100 **	-0.099 **
Intrinsic motivation	—	0.198 ***	—

		Standardised B coefficient	
Amotivation	—	—	0.077 ns
Model R^2		8.2%	5.8%

Note. Standardised β coefficients. Reference categories: Social Sciences (programme), Male (gender), Disadvantaged (SES), Other (housing), and Not first-time entrant (entry status). The dependent variable is the composite score of higher-utility techniques (0–25). ***p < .01; **p < .05; *p < .10; ns = not significant.
Source: Authors

4.3 Student participation in the proposed remedial programme

4.3.1 Attendance and completion rates

A total of 60 students attended the lecture component of the remedial module, and 74 participated in at least one tutorial session. In total, 54 students (27%) attended at least one session (lecture or tutorial), and 42 students (21%) completed the entire module. The low completion rate may reflect the optional nature of the programme.

4.3.2 Factors influencing participation

We estimated logistic regression models to assess the probability of attending at least one session, including the lecture.

Table 8. Probability of Participating in at Least One Session of the Remedial Module (odds ratios, Exp(B))

		Exp(B) Value			
Reference Variable	**Active Variable**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Gender	Female vs. Male	0.448 ***	0.458 ***	0.479 ***	0.523 ***
Socio-economic status (SES)	Advantaged vs. Disadvantaged	1.085 ns	1.129 ns	1.145 ns	1.053 ns
	Middle vs. Disadvantaged	0.976 ns	1.005 ns	1.035 ns	0.935 ns
Type of housing	Own vs. Other	0.690 ns	0.665 ns	0.663 ns	0.682 ns
	Parental vs. Other	1.265 ns	1.233 ns	1.178 ns	1.371 ns
Self-perceived academic level	Good vs. Low	0.715 ns	0.760 ns	0.749 ns	0.723 ns
Intrinsic motivation	—	0.994 ns	—	—	—
Amotivation	—	—	1.038 ns	—	—
Use of ineffective techniques	High vs. Low			0.936 ns	
Nagelkerke R^2		16.2%	15.6%	15.4%	18.1%

Note. Odds ratios (Exp(B)). Reference categories: Male (gender), Disadvantaged (SES), Other (housing), Low (Self-perceived academic level). ***p < .01; **p < .05; p < .10; ns = not significant. Source: Authors

In all models, female students were significantly less likely to participate in the remedial module. No other predictors showed statistically significant effects.

4.3.3 Session attendance patterns

We also modelled the number of sessions attended as a continuous outcome (Table 9).

Table 9. Effect of Student Characteristics on the Number of Module Sessions Attended (Standardised β coefficients)

		B Coefficient Value			
Reference Variable	**Active Variable**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Gender	Female vs. Male	-0.236 ***	-0.230 ***	-0.231 ***	-0.225 ***
Socio-economic status (SES)	Advantaged vs. Disadvantaged	0.009 ns	0.001 ns	0.002 ns	0.005 ns
	Middle vs. Disadvantaged	0.020 ns	0.005 ns	0.014 ns	0.006 ns
Type of housing	Own vs. Other	0.015 ns	0.024 ns	0.019 ns	0.010 ns
	Parental vs. Other	0.095 ns	0.090 ns	0.086 ns	0.094 ns
Self-perceived academic level	Good vs. Low	-0.038 ns	-0.033 ns	-0.035 ns	-0.045 ns
Intrinsic motivation	—	—	-0.001 ns	—	—
Amotivation	—	—	—	0.023 ns	—
Use of ineffective techniques	High vs. Low	—	—	—	-0.033 ns
R^2		21.6%	20.9%	20.6%	21.1%

Note. Standardised β coefficients. Reference categories: Male (gender), Disadvantaged (SES), Other (housing), Low (Self-perceived academic level). ***p < .01; **p < .05; p < .10; ns = not significant.
Source: Authors

Across all models, female students attended significantly fewer sessions on average. No other predictors reached statistical significance.

4.3.4 Summary of findings

Participation in the remedial programme was modest overall, and clear gender differences emerged in both likelihood of participation and number of sessions attended. These results suggest that programme design and scheduling may influence the uptake of optional academic support modules, particularly among female students.

5 DISCUSSION

This study investigated the diversity of study practices among first-year undergraduates and the individual factors associated with both the use of effective strategies and the experience of common study difficulties. The findings supported the working hypotheses derived from the theoretical framework: motivation, gender, field of study, and self-perceived academic competence were systematically associated with students’ approaches to learning at the outset of university.

Across the sample, students reported widespread reliance on familiar, lower-utility techniques (e.g., rereading, highlighting), whereas higher-utility practices—such as self-testing, elaboration, interleaving/variation and spaced practice—were comparatively less frequent. This pattern is consistent with cognitive and self-regulated learning research indicating that students often favour convenient but suboptimal strategies and may lack explicit instruction for implementing evidence-based techniques (Dunlosky & Rawson, 2015; Karpicke et al., 2009; Panadero, 2017).

Motivation emerged as a key determinant. Intrinsic motivation was positively associated with a broader and more effective repertoire of study practices, while amotivation related to difficulties initiating academic tasks. These associations align with Self-Determination Theory and work linking motivational orientation to self-regulation and deep processing (Ryan & Deci, 2000; Zimmerman & Schunk, 2011), including recent Latin American evidence on competence/autonomy support and strategy use (Bustamante-Mora et al., 2023; Carranza et al., 2022; Wang et al., 2024).

Gender, disciplinary context and academic self-concept also mattered. Female students reported a wider strategic repertoire; students in Science programmes showed greater engagement with effective techniques than peers in Social Sciences; and a positive self-perceived academic level was linked to fewer difficulties starting work. These patterns converge with regional studies that document uneven academic socialisation at entry to university and the importance of self-regulatory habits (Cavagnoud & Ames, 2024; Lagubeau et al., 2020; Pérez-González et al., 2022).

Methodologically, the item-level approach (29 items) provided nuance that composite indices can obscure, pinpointing specific behaviours (e.g., task initiation, planning, self-testing) that are amenable to targeted support—thus answering calls for

more granular, context-sensitive measurement in higher education research (Dunlosky et al., 2013; Marín-Díaz et al., 2022).

The results suggest that improving equity in early university requires more than broadening access. First, explicit instruction and practice opportunities for higher-utility techniques (retrieval practice, spacing, elaboration, interleaving) should be embedded within disciplinary courses rather than confined to optional remediation. Second, motivation-supportive teaching—fostering autonomy, competence and relatedness—can address initiation difficulties and narrow gaps linked to prior schooling (Ryan & Deci, 2000; Wang et al., 2024; Zimmerman & Schunk, 2011). Third, programme design and timetabling appear salient for participation in support offers; where study-skills provision is integrated and scheduled within programmes, uptake barriers are likely lower (Cavagnoud & Ames, 2024; Koçoğlu & Haidari, 2025; Lagubeau et al., 2020). These implications align with regional priorities to democratise retention and success (Tinto, 2017) and speak directly to educational equality. These implications speak directly to educational equality: by embedding evidence-based study-skills instruction and motivation-supportive teaching at programme level, institutions can reduce entry-level disparities and promote sustained engagement among under-represented groups.

Several limitations should be noted. Findings are context-specific (single public university; four programmes; N = 200) and rely on self-report in a cross-sectional design; causal inference is not warranted and generalisability is limited. Model fit was modest, suggesting unmeasured contributors (e.g., assessment design, workload, peer dynamics, instructional clarity). Measures of motivation were captured with SIMS; only intrinsic motivation and amotivation were included in the main models.

Future studies should employ longitudinal and mixed-methods designs, combining survey data with behavioural or administrative records (e.g., LMS traces, grades) to track change over time; experimentally test whether embedding strategy instruction within first-year disciplinary modules improves uptake and outcomes, especially for under-represented groups; examine potential moderators (e.g., integration and timetabling at the programme) to assess whether they condition gender or motivation effects on participation; and develop implementation-quality measures (e.g., spacing schedules, retrieval frequency, feedback cycles) to capture how strategies are actually used.

6 CONCLUSIONS

This study highlights that first-year undergraduates commonly rely on lower-utility study techniques. Intrinsic motivation, gender, disciplinary context, and self-perceived academic competence were systematically associated with the breadth and effectiveness of students’ study practices. By employing an item-level analytical approach, the study uncovered actionable behavioural patterns often obscured by composite scores.

To foster equitable learning, institutions should embed explicit instruction and opportunities to practise high-utility techniques—such as retrieval practice, spaced learning, and elaboration—within first-year disciplinary curricula. Motivation-supportive teaching strategies may help address initiation difficulties and reduce academic disparities linked to prior educational experience.

While the findings offer practical insights, several limitations must be acknowledged. The study relied on self-reported data from a single public university and used a cross-sectional design. Generalisability is therefore limited, and no causal inferences can be made.

Future research should adopt longitudinal and experimental designs to examine whether programme-level integration of study-skills instruction fosters sustained uptake and academic success—particularly among under-represented students. Investigating structural moderators (e.g., scheduling and curricular integration) may also help identify scalable, equity-oriented interventions. Such designs align with the aims of this Special Issue and offer promising avenues to promote inclusive student success in public universities.

CREDIT AUTHOR STATEMENT

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INSTITUTIONAL REVIEW BOARD STATEMENT

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki and the institutional regulations of the host university. According to institutional policies, formal ethical approval was waived because the study did not involve medical procedures, sensitive personal data, or interventions posing any risk to participants. Prior to data collection, all participants were fully informed about the purpose of the study and provided their voluntary written informed consent. Anonymity and confidentiality were strictly maintained, and all collected data were anonymized to protect participants' identities.

INFORMED CONSENT STATEMENT

Informed consent was obtained from all subjects involved in the study.

DATA AVAILABILITY STATEMENT

The data supporting this study's findings are not publicly available due to ethical and privacy restrictions. As the dataset contains sensitive participant information, it cannot be shared. For any inquiries regarding the data, please contact the corresponding author.

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Authors' Contribution

Both authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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