

LEARNING STRATEGIES IN UNIVERSITY STUDENTS: A review article

Brannly Jarley Valles Quispe; Sharon Mendoza Lozano; Lin Álvarez Ríos; Tony Venancio Pereyra Gonzales; Alex Oblitas Serrano; Violeta Cadenillas Alborno

Universidad Cesar Vallejo - UCV, Moyobamba, San Martin, Peru.

Corresponding author: bvallesq@ucvvirtual.edu.pe; Master in Business Administration.

Abstract

The objective of this study was to analyze the implications of learning strategies in university students. As a method, original articles indexed in the Scopus database, published between 2020 and 2024, open access, in English and Spanish, were considered. As a result, learning strategies generate creativity and communication, allowing the acquisition of knowledge relevant to university education, facilitating the development of various competencies and skills. Through the creation of best practices, behavioral patterns as a learning technique offer students a significant benefit for their training. The student must dedicate time and effort to develop self-regulated learning strategies for academic integration that allows for solid professional and personal training.

Keywords

- Educational cooperation
- Skills
- Competencies
- Educational strategies

Introduction

In the current educational context, learning strategies play a crucial role in the academic performance of university students and are considered fundamental in the educational process (Contreras, 2021; Vega et al., 2024). These strategies are defined as the set of tools that the student uses to facilitate the teaching-learning process, and they contribute not only to performance, but also prepare students for the challenges of the knowledge society, where the ability to learn is important (Díaz-García et al., 2023; Ernst et al., 2022).

However, various investigations at a global level have identified significant problems in this area. At an international level, the situation is varied as in the case of Saudi Arabia, although the use of some learning strategies such as metacognition and memory keys were identified, the need to pay more attention to these strategies to improve academic performance was emphasized (Almoslamani, 2022). In Spain, a limited "learner engagement" has been observed, which negatively impacts the development of learning strategies and academic performance (Gavín et al., 2024).

In Latin America, in Ecuador, it was identified that university students have a low level of use of learning strategies, this situation limits the advancement of the knowledge society (Bernabé et al., 2022). In Colombia, based on a study, they found an average level of use of learning strategies, due to the fact that students lack an excellent commitment to their studies (Gómez et al., 2021). In Mexico, a study carried out identified that students showed a low influence in the context of learning performance, as a result of the Covid-19 pandemic, limiting the retention and transfer of knowledge (Demuner et al., 2023).

In Peru, the need and importance of developing integrative models of student learning is highlighted, incorporating both cognitive and emotional components so that students internalize,

grow, and incorporate these models into their lives in the form of useful personalities (Galvez, 2023). However, due to the COVID-19 pandemic, university students may present a low level of learning and academic performance (Acheampong, 2023). This leads to the adoption of new learning strategies that encourage teachers and students to boost academic performance (Asencios & Rivas, 2022; Gianfredi et al., 2024).

In teaching, learning strategies are considered means to achieve a goal. The use of tactics that the teacher actively employs in the educational process results in good teaching together with the teacher's knowledge (Madrid et al., 2023). Likewise, learning strategies are defined as the ideal means used by students, which contributes to or facilitates the teaching-learning process (Demuner et al., 2023). Similarly, it defines it as the set of tools that human beings use, allowing them to be able to learn permanently during a given process (Bernabé et al., 2022). Consequently, it is defined as cooperative teaching-learning methodologies that promote learning by competencies, developing professionals capable of meeting social demands (Martínez & Garcés, 2020).

In this context, learning strategies are conceived as methods for “learning to learn”, where students explore their capabilities and search for the meaning of the material studied (Gonzalo et al., 2020). In today's knowledge society, these strategies are crucial due to the growing need for adaptability and continuous learning (Bernabé et al., 2022).

Regarding the approach, Entwistle (1987), studied by Asikainen & Gijbels (2017), defined learning as a method that recognizes the student's goals and their relationship with the educational environment. He identifies three approaches: the deep one, where the student seeks to actively understand the material, connecting it with previous knowledge; the superficial one, focused on memorization without reflection; and the strategic one, where the student adapts his techniques to achieve academic success; each approach reflects a different way of interacting with the educational material.

Whereas, Biggs (2005) described three approaches to learning based on students' interpretations of academic tasks. The deep approach seeks to approach the work in a meaningful way, requiring a solid foundation of prior knowledge. The surface approach prioritizes completing the task quickly, favoring memorization over comprehension. The achievement (or strategic, according to Entwistle) approach focuses on getting the best grades, emphasizing time management rather than the relationship of the material to self-organization.

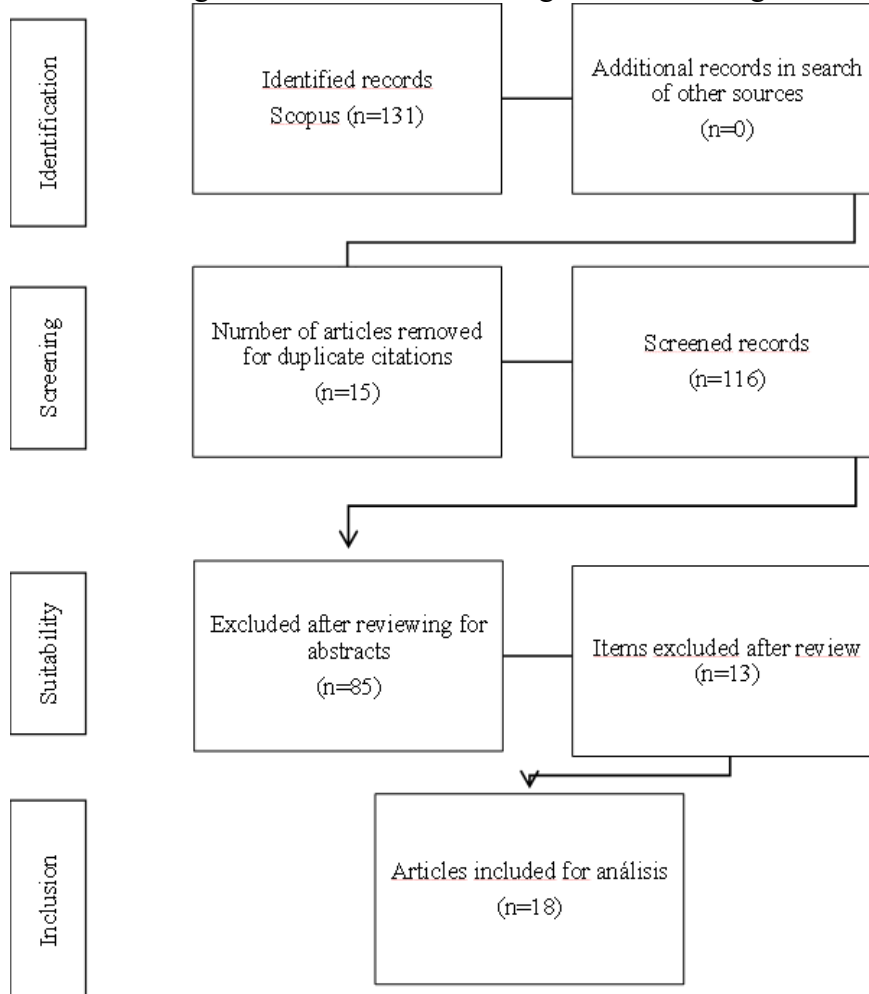
Approaches to learning, whether deep, surface, or strategic, significantly influence how students approach their academic tasks and, consequently, their performance. Understanding and properly applying these approaches is crucial for academic success (Pérez et al., 2020; Gomes et al., 2022). Under this situation, the following research question was raised: What are the implications of learning strategies in university students? Thus, the following main objective was formulated: to analyze the implications of learning strategies in university students, also characterizing the research selected during the review in databases.

Methodology

Academic articles were selected through exhaustive searches in databases, prioritizing those indexed in Scopus. The search strategies employed Boolean operators AND and OR, using keywords in Spanish and English and their combinations: ("learning strategies") AND ("university students" OR "higher education") AND ("self-regulated learning" OR "collaborative learning") AND ("academic performance" OR "academic performance") AND ("teaching strategies") OR ("metacognition" OR "cognitive skills").

Open access studies published between 2020 and 2024, in English or Spanish and articles with identification (DOI) were included. To ensure the transparency and systematization of the process, the PRISMA flowchart was used, which details the stages of identification, selection, eligibility and inclusion of research (Figure 1):

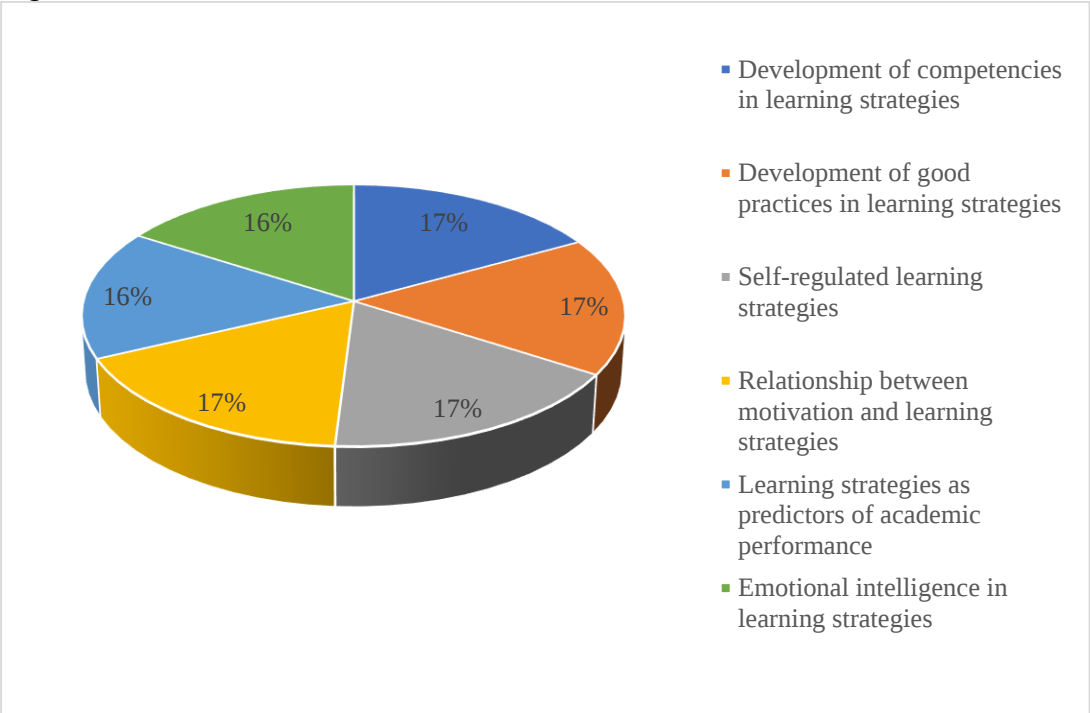
Fig. 1. Flowchart for selecting items according to the Prisma Declaration



Source: Compiled by author

Scopus database, of which competence development, good practices, self-regulated learning, the relationship between motivation and learning strategies each represented 17% of the articles analysed, with three studies in each category. Finally, learning strategies as predictors of academic performance and the influence of emotional intelligence on these strategies each constituted the remaining 16%. This distribution reflects a diversified academic interest in various aspects of learning strategies in higher education, shown in Figure 2:

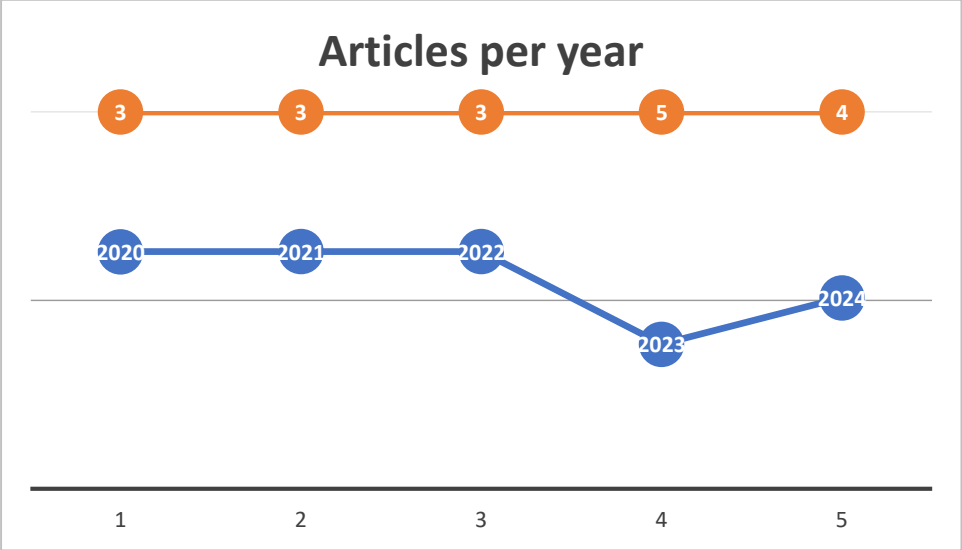
Fig. 2. Most used content in literature review



Source: Compiled by author

Regarding the number of articles per year, there is evidence of an increase in the last two years, 2023 and 2024, of publications, compared to the previous years, as shown in Figure 3 below:

Fig. 3. Articles found by year



Source: Compiled by author

Results and discussion

Table 1 lists the research included in this study on learning strategies in university students:

Table 1. List of selected research on learning strategies

No.	Affair	Author	Findings
1	Strategies for learning and developing skills	Hernandez et al. (2021)	Cooperative learning is conducive to the development of various investigative skills.
2	Gamification in the development of soft skills such as creativity and communication	Rivera et al. (2024)	Gamification helps to acquire knowledge and skills through creativity and communication.
3	Teaching strategies for virtual university education	Rivera et al. (2023)	Teaching strategies are very important; however, they need to be adapted to the type of educational model.
4	Good practices and learning strategies	Gozalo et al. (2020)	Good student practices are related to learning perspectives and allow them to train and evaluate themselves.
5	Interpersonal skills and active learning	Acevedo & Lazar (2022)	Active learning enhances college students' cultural assets and fosters the growth of interpersonal skills.
6	Collaborative work as an innovative teaching method	Nieto et al. (2024)	Collaborative work has been valued as an appropriate approach to improve knowledge acquisition.
7	Self-regulated learning strategies in students during the pandemic	Demuner et al. (2023)	Knowledge retention and transfer is expected to have a significant impact on student performance.
8	Self-regulated learning and pedagogical resource management strategies	Mina et al. (2021)	Self-regulation involves the incorporation of resources and generates a solid learning construction in university students.
9	Service learning in engineering student retention	Cornejo & Sanchez (2022)	Implementing innovative learning strategies achieves significant learning in the student, through theory and practice.
10	Supporting autonomy on academic satisfaction: motivation and academic commitment	Froment et al. (2023)	Motivation and commitment are mediators that teachers must incorporate to encourage autonomy in university students.
11	Cognitive learning strategies and study control	Felipe et al. (2020)	Cognitive strategies and study control generate greater performance and better results from university students.
12	Learning strategies and student engagement	Gavin et al. (2024)	Learning strategies and student engagement foster the acquisition of skills for continuous learning.
13	Learning strategies as predictors of academic performance	Vasquez (2021)	The learning strategies of university students predict their academic performance. Therefore, educational policies and practices that improve learning must be implemented.

14	Time management in Paraguayan medical students	Maidana et al. (2023)	Student time management is a predictor that suggests that disorganized behavior is a minor factor, thus discouraging students from engaging in unplanned activities.
15	Flipped classroom in learning strategies	Espada et al. (2020)	It is shown that the use of the flipped classroom approach increased the initial scores of the participants.
16	Emotional intelligence in the development of learning strategies	Nieto et al. (2024)	Anger is described by high emotional attention and low emotional clarity and repair, enjoyment is explained by high emotional clarity and repair.
17	Students' academic lives: positive emotions, mastery goals, and engagement	Datu et al. (2022)	Positive emotions do not predict subsequent proximal mastery goals or academic engagement. Subsequent positive emotions, behavioral engagement, and cognitive engagement are favorably predicted by proximal mastery goals.
18	Relationships between attention, clarity and emotional repair with ruminative responses	Bueno et al. (2023)	It shows that the only way in which the relationship between rumination elements and emotional attention changed was according to the degree of repair.

Source: Compiled by author

The discussion on learning strategies and skill development in university students reveals a multifaceted and dynamic panorama. The findings of various authors underline the effectiveness of methods such as cooperative learning (Hernández et al., 2021), gamification (Rivera et al., 2024), and active learning (Acevedo and Lazar, 2022) to improve both academic and interpersonal skills. The importance of self-regulated learning (Demuner et al., 2023; Mina et al., 2021) and effective time management (Maidana et al., 2023) are highlighted as key factors for academic success. In addition, the crucial role of emotional intelligence (Nieto et al., 2024) and motivation (Froment et al., 2023) in the learning process is emphasized. Adapting teaching strategies to the specific educational model (Rivera et al., 2023) and implementing innovative practices such as the flipped classroom (Espada et al., 2020) are also considered fundamental. Taken together, these findings suggest that a holistic approach that integrates cognitive, emotional, and motivational aspects is essential to optimize learning and skill development in higher education.

Learning strategies

Cooperative learning facilitates the development of various research competencies and other critical skills necessary to take advantage of current or future employment opportunities where these competencies are needed (Hernández et al., 2021). Therefore, through gamification, important application procedures are identified as those that foster greater creativity and communication and help people acquire the knowledge and skills necessary for a university education (Rivera et al., 2024). On the other hand, planning, control, motivation, communication, trust, empathy, creativity, design, forms of evaluation, collaborative work, constructivist approach and self-regulation techniques are some of the didactic tactics for online learning, however, they need to be modified to adapt to the needs of the educational model (Rivera et al., 2023).

Students' behavioral patterns and their different learning strategies provide interesting input, as students' Good Practices can be formed and assessed and are closely related to the student-centered learning perspective (Gozalo et al., 2020). It is found that the cultural diversity of first-generation college students increases with active learning, and that interpersonal skills are developed in both first- and second-generation students (Acevedo & Lazar, 2022). Although it involves more work and commitment from both the teacher and the student, collaborative work has proven to be an effective way to improve knowledge acquisition (Nieto et al., 2024).

The educational system has been facing multiple challenges in the knowledge society for several decades, including equity, modernization of learning processes, adaptation to labor demands and citizenship training (Ottone & Hopenhayn, 2007; Álvarez et al., 2024). According to their assessment of support, retention, and knowledge transfer, university students' success is significantly predicted by their use of self-regulated learning practices (Demuner et al., 2023).

The development of self-regulation is a process that requires time and effort on the part of the student and demands the increasing integration of resources from the academic context. The development of self-control demonstrates the student's successful academic integration in the university context and the solid construction of his or her career (Mina et al., 2021). On the other hand, to train better professionals and citizens, it is essential to put into practice creative and participatory learning proposals that integrate theory and practice, achieve meaningful learning in students, connect them with environmental problems, and foster a greater sense of social responsibility (Cornejo & Sánchez, 2022).

Through the complementary mediating effects of academic engagement and motivation, measures that support college students' autonomy and enhance their learning process can be incorporated into teacher preparation programs (Froment et al., 2023). Research has shown that students who achieve better results use a greater variety of study control strategies than students who achieve worse results. These strategies include planning, reviewing, searching for alternatives, time management, relearning, task detailing, controlling external variables, and having personal study aids (Felipe et al., 2020). Training activities that promote awareness of the learning process, the acquisition of skills necessary for lifelong learning, and professional development can be facilitated with the help of college students' learning strategies and their relationship with academic motivation and learner engagement (Gavín et al., 2024).

University managers should propose the creation of educational policies and programs aimed at achieving better learning, since the learning strategies used by students are predictive of their academic performance (Vásquez, 2021). Therefore, it can be stated that time management in students is a predictor that indicates that the preference for disorganization is a factor with less importance, because it partially contrasts with the assessment of goals and priorities, managing to prevent students from carrying out unplanned activities (Maidana et al., 2023). Similarly, the intervention has a long-term beneficial impact on management, showing that students achieve higher scores, applying the flipped classroom method. In addition, they demonstrate a main effect using the resource management method, achieving superior results (Espada et al., 2020).

While anger is described by high emotional attention and low emotional clarity and repair, enjoyment is explained by high emotional clarity and repair. Effective application of deep learning

procedures is predicted by enjoyment, and a part of this effect is generated by effective emotional repair (Nieto et al., 2024). Likewise, the engagement and goals aspects of the mastery method have favorable correlations with positive emotions at the same time. After adjusting for autoregressive effects, positive emotions do not predict subsequent academic engagement or mastery goals (Datu et al., 2022). Therefore, the degree of repair is a component that affects the link between rumination variables and attention. The relationships between each rumination element and emotional attention, as well as emotional clarity and repair, are shown (Bueno et al., 2023).

Conclusions

This systematic review on learning strategies in university students highlights their importance for academic success and comprehensive development. Strategies are essential tools for developing competencies, fostering creativity and acquiring relevant knowledge. The role of behaviour patterns and collaborative work in the learning process is emphasised, underlining the need for engagement between teachers and students. Self-regulated learning emerges as a process that, although demanding, leads to better academic integration and professional training. Academic engagement and motivation are identified as factors that drive student autonomy. Specific strategies such as planning and time management have proven effective in improving academic outcomes. Research also underlines the crucial role of emotional intelligence in learning, associating positive emotions with better academic performance.

While this study provides a solid foundation for understanding the impact of learning strategies in higher education, offering valuable insights for improving teaching-learning processes, it is important to acknowledge its limitations. The review is constrained by the methodological limitations of the original studies included, which may affect the generalizability of the findings. Additionally, the nature of systematic reviews does not allow for establishing direct causal relationships between learning strategies and academic outcomes, but rather provides an overview of trends and patterns observed in the existing literature.

Furthermore, the review may be limited by potential publication bias, as studies with positive results are more likely to be published and included in such reviews. The heterogeneity of the included studies in terms of sample sizes, cultural contexts, and specific learning strategies examined may also impact the consistency of the findings. Another limitation could be the lack of consideration for the long-term effects of learning strategies, as most studies focus on short-term academic outcomes.

Future research could benefit from longitudinal and experimental studies that allow for the assessment of the long-term effectiveness of the identified learning strategies and their applicability in different educational settings. Additionally, more research is needed to explore the interaction between various learning strategies and individual student characteristics, as well as the role of technology in facilitating effective learning strategies in higher education.

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