Autonomous Learning in Higher Education Students: A Systematic Review of The Literature On Wos Between 2019-2022

Carlos Martín Mares-Ruiz[1], Lizbany Sujey Cardoza-Sernaqué[2*], Yadira Julia Jiménez-Jáuregui[3], Sofía Emilce Belleza-Torrejón[4], Lissette Margarita Salas-Torres[5], José Víctor Peláez-Valdivieso[6]

[1,3,5]*University César Vallejo, Lima, Peru*

[2,4]*Technological University of Peru, Lima, Peru; E-mail: c21809@utp.edu.pe*

[6]*Universidad Privada Norbert Wiener, Lima, Peru*

Abstracts: In higher education, autonomous learning is the capacity that students develop from the combination of a series of affective, social, cognitive and metacognitive factors that allow students to self-regulate their learning. In this context, the present study aims to systematize the evidence from the scientific literature in relation to autonomous learning in higher education students. The PRISMA 2020 method was used for the phase of identification of records in the WoS (Web of Science) database during the period 2019-2022, which allowed the identification of 8,339 studies, and from the application of data exclusion criteria, 13 were selected. studies whose purpose was to answer the research question: What skills do higher education students use to develop autonomy in their learning? The data was systematized based on the authors, countries of publication according to the origin of the journal, keywords, dimensions, instruments used, application strategies and conclusions of the studies to analyze possible patterns, similarities and characteristics that can be contrasted with others. studies to identify possible strengths or weaknesses regarding autonomous learning in higher education students. The results show that Spanish journals lead in content on the subject. Likewise, there is a wide variety of keywords such as: higher education, academic self-regulation, learning strategies, etc. In addition, 84.6% of the studies used questionnaires for the development of their research. It is concluded that, according to the content of the studies, it is important to highlight that the use of ICT and teaching support are important to promote the self-regulation of the learning of university students, as well as to highlight that, through pedagogical mediation, Through counseling, tutorials and teaching support, it facilitates the development of planning skills, concentration, motivation and reflection on the learning of higher education students.

Keywords: Autonomous Learning, Students, Higher Education, ICT, Systematic Review.

1. INTRODUCTION

Entering university life is a moment of great satisfaction and pride combined with uncertainty and fear. This is a process that proposes personal, social, family and academic changes, which must be assumed from the moment of deciding to enter higher education. Even the strategies that the learner applied for years and that were useful must be modified and adapted to the new contexts, to acquire new habits and educational practices [1]; that is, the development of new roles and commitments in the student is required, leading him to improve or modify certain skills, beliefs or ideas about university education and the achievement of its effectiveness [2].

Thus, there has been a shift from the "university of teaching" to the "university of learning" [3], from a constructivist conception of learning, based on meaningful knowledge and autonomy of the student, who knows his own cognitive and metacognitive processes also understood as autonomous learning that allows him to reflect on his own instruction and enrich his cognitive structure [4], [5].

Autonomy is then the ability of the student to take charge of his or her own learning through objectives and the progression of this [6], [7]. It can also be understood as the ability to learn to learn, where students become eternal learners, governing their own learning process [8]. A process in which it will be necessary, constantly, to count on the active involvement of students in order to build their own study, capable of monitoring and evaluating their performance, thus overcoming the comfort of copying notes or simply handling and reproducing the contents of a manual [9].

It should be emphasized that autonomy is a teacher-student link where the teacher guides, gives instructions, illuminates the dilemmas and directs the students so that they can establish their purposes and achieve their graduation [10]. In this sense, it is also a call to action for teachers, who must motivate it, through instructions on how to assume the activities entrusted and encourage these same practices to fulfill the rest of their responsibilities and monitor their progress for proper learning [8], [11].

The teacher's motivation should encourage "critical and reflective thinking" and give way to self-direction and self-regulation of one's own learning process [12]. In this sense, the learner chooses, prepares, links and interprets new knowledge and incorporates it into his or her intellectual organization, being able to use it later in different aspects of life [13].

In this transition, the link between motivation and autonomy is evident, since the desire to learn is the force that leads us to carry out activities [6]. In addition, it is here that students expected to have intrinsic interest in studying, to engage in the use of deep processing strategies, to make an effort, to take responsibility for the tasks and to have self-regulation strategies [14].

The year 2020, a time of pandemic, has shown the need and urgency of fostering skills that allow students to be self-managing and self-regulated, including even competencies to plan their learning activities and self-evaluate [15]. Undoubtedly, the use of digital technologies has not only been used for the design of didactic resources in virtual teaching, but fundamentally they have represented valuable instruments and tools for students to develop autonomous learning that have allowed them to investigate, research, develop the ability to create and provide solutions to their environment [16].

ICT thus became an unavoidable demand [17] and the current university students who are the centennials or generation Z, digital natives who grew up in the midst of technological transformation, adapted to it and are in contact with this form of online education [18]. In this autonomous management, learners deployed a series of skills such as analyzing and discriminating information, comparing data, facts or phenomena, as well as explaining, arguing, evaluating and formulating proposals for solutions to their learning difficulties [19]. In addition, competencies such as organization, self-learning, use of technological applications, autonomy, adaptation [20], and even creativity, innovation and critical thinking [21], [22].

Therefore, it is of great interest today to develop cognitive and metacognitive skills that strengthen the autonomy of university students in the process of learning and development of their generic and specific competencies of their professional training [23]. To this end, the renewal of curricula is imminent [24], as well as more flexible work environments that allow the diversification of structures, modes and ways of organizing study, knowledge and competencies for the teaching-learning process [25], [26].

Finally, the development of autonomous learning is important because it involves the three pillars of education: knowing, knowing how to do and wanting; the same that contribute to the management and construction of knowledge, generating capacities of initiative, critical and reflective attitude, use of self-regulated metacognitive skills [12], leadership, motivation, creativity and innovation in the student as well as the practice of synergy, assertiveness and cooperation in the classroom and the community [27].

Considering the importance of autonomous learning in the field of professional training and accelerated after the pandemic context, the need arises to address the systematic review of the literature that provides an answer to the research question: What skills do higher education students use to develop autonomy in their learning? The objective of the study was: to analyze and systematize the existing literature in the WoS (Web of Science) database on autonomous learning in higher education students during the period 2019-2023, as well as to identify the literature produced during the period 2019-2023; to collect information regarding the place/country of publication based on the origin of the journal; to identify which are the key words dimensions and instruments, focus of the study; and finally to analyze the results of the research.

2. METHODOLOGY

For the development of the systematic review of the literature, understood as a critical and replicable synthesis of the results of scientific publications available in databases on the same topic, which provides a better scope for answering the research questions [28]. The PRISMA 2020 method was used as an orderly and structured guide for the preparation and publication of systematic reviews and meta-analysis [29], which have been carried out in recent years and have achieved important results in research [30], [31].

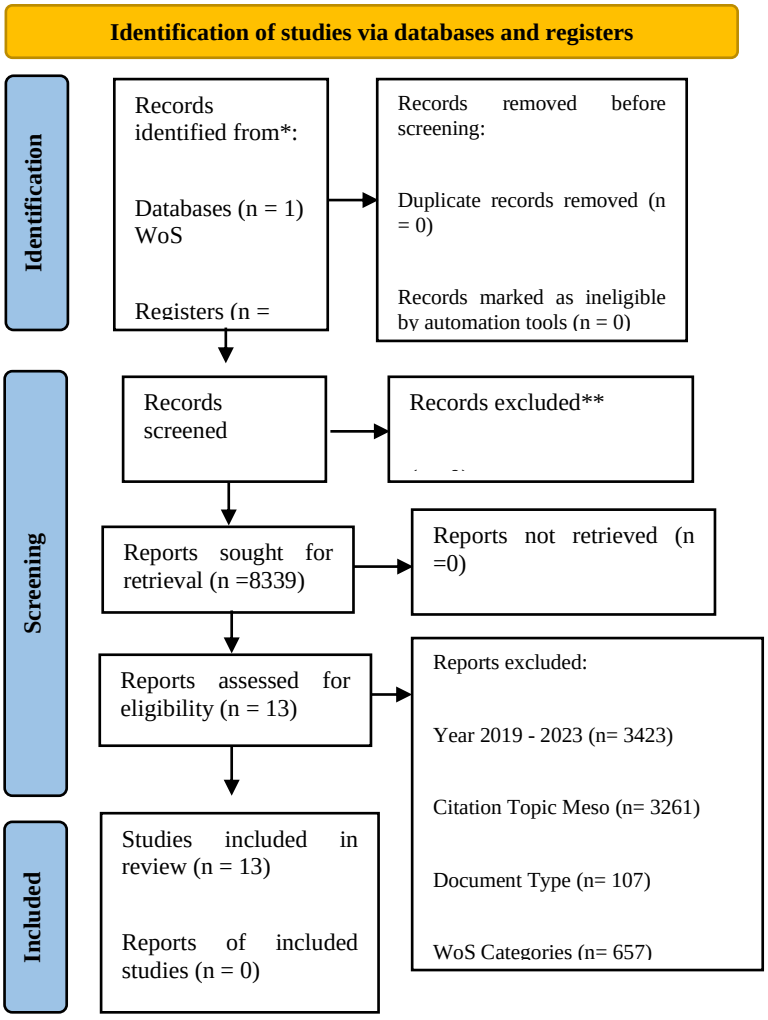

Figure 1. PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only.

During the data identification phase, we chose to use the WoS (Web of Science) database, since it adopts criteria recognized by the scientific community, as well as multidisciplinary publications from different countries and languages. For convenience, the English language was used to construct the search equation for studies with the combination of key words (Table 1), returning a number of studies, which are detailed in Table 2.

In addition, Boolean descriptors were used to elaborate the search equations in the database, in this case: "AND", "OR", "NOT". Phase 1 of the search generated a total of 8,339 studies which, after the application of inclusion and exclusion criteria, finally resulted in 13 articles, as shown in Fig. 1, called PRISMA 2020, flow diagram (PRISMA 2020).

Table 1. Keywords, search synonyms.

Key words	Search synonyms
Autonomous learning	"Autonomous learning" OR "Independent learning" OR "Self-learning" OR "Self-regulated learning"
University student	"University student" OR University

Table 2. Search equation in wos and details of study identification.

Database (WoS)	Initial and final search equation (English)	Registrations
Before refining	("Autonomous learning" OR "Independent learning" OR "Self-learning" OR "Self-regulated learning") AND ("University student" OR University)	8339
After refining	(((ALL=(("Autonomous learning" OR "Independent learning" OR "Self-learning" OR "Self-regulated learning") AND ("University student" OR University))) AND (TMSO==("6.11 Education & Educational Research") AND PY==("2023" OR "2022" OR "2021" OR "2020" OR "2019") AND DT==("ARTICLE") AND OAJ==("ALL OPEN ACCESS") AND LA==("SPANISH") AND TASCA==("EDUCATION EDUCATIONAL RESEARCH") AND CU==("MEXICO" OR "ARGENTINA" OR "CHILE" OR "COLOMBIA" OR "ECUADOR" OR "COSTA RICA" OR "CUBA" OR "PERU"))) NOT (DX2NG==("11373749"))) NOT (DX2NG==("7128153"))	13

The criteria for inclusion and exclusion of studies were developed taking into account the following requirements: (a) full articles on autonomous, self-regulated or independent learning; (b) open access text files; (c) scientific publications in Spanish; (d) publication interval between 2019 and 2023; (e) research topic: education and educational research; (f) Spanish-speaking countries in the Americas, since the European reality is very different; (g) research on university students; (h) studies that are articles, excluding theses, books, conference papers and reviews.

It is worth mentioning that during the analysis, articles belonging to Ana C. Maldonado-Fuentes, because the article escapes from the subject of study and presents qualitative research that is characterized by social representations on the evaluation of teachers in training and that of Florencia Daura, since the study is focused on high school students. In addition, it was possible to identify that, according to the established criteria, no publication was registered during the year 2023, which is why the results presented are given during the interval 2019-2022.

The systematization of the selected research generated 2 content study matrices (tables) which emphasize: author and year; title of the study; country of publication; key words; dimensions described; instruments used; research approach; strategies and conclusions.

3. RESULTS

The results of the 13 studies included in the review are detailed below. It is presented in two parts, Table 3 and 4 show evidence collected on autonomous learning in higher education students.

Table 3. Evidence collected on autonomous learning showing: author/year, country of publication, key words and dimensions

	Author/ Year	Title	Country (Source)	Key words	Dimensions
1	(Martínez y Gaeta, 2019) [32]	Use of the Moodle virtual platform for the development of self-regulated learning in university students.	Spain	Higher education, self-management, learning strategies, motivation, information and communication technologies	Cognitive, Motivational, Supportive strategy, contextual
2	(Puya et al., 2021) [33]	Academic self-regulation and autonomous learning in the Basic Education program at	Ecuador	Academic self-regulation, autonomous learning, teaching and learning process.	Student volume, academic self-regulation, educational level, explorer,

		Peninsula Santa Elena State University.			integrator.
3	(Gaxiola y González, 2019) [34]	Perceived support, resilience, goals and self-regulated learning in high school graduates.	Mexico	Learning strategies, baccalaureate, student adaptation.	Positive attitude, sense of humor, perseverance, religiousness, self-efficacy, optimism and goal orientation.
4	(Vargas y Villalobos, 2019) [35]	Teaching strategies for the promotion of autonomous learning in university students using LMS platforms.	Costa Rica	Distance education, LMS, learning in autonomy, learning to learn, meaningful learning	Collection of information, manager of your learning.
5	(Tur et al., 2022) [36]	Self-regulated learning and Personal Learning Environments in initial teacher training student perceptions and proposals for tools and resources.	Spain	Training of trainers, university teaching, perception, learning strategy, information technology.	Self-regulated learning in digital environments, virtual learning environments, learning processes
6	(Gaeta et al., 2020) [37]	Future outlook, learning patterns and academic performance in Mexican university students.	Spain	Future perspective, learning patterns, learning, higher education.	Learning strategies, dominance of different learning patterns and academic performance.
7	(García et al., 2020) [38]	Self-regulation of learning in distance vocational education: effects of time management.	Spain	Educational technology, vocational training, e-learning, self-regulation, time management	Self-regulation of learning, improvement of learning efficiency, study time, and control group.
8	(Dolores et al., 2022) [39]	Positive parenting and self-regulation of learning in adolescents.	Ecuador	Positive parenting, self-regulated learning, active learning, parental achievement goals, motivation, parental control.	Motivation for learning, autonomy for self-regulated learning, positive relationship
9	(González et al., 2019) [40]	Teaching climate conducive to learning. A study at the Faculty of Engineering of the University of Atacama.	Cuba	Classroom environment, higher education, quality of education perception, Teaching process.	Organization and discipline, cooperative learning
10	(Moreno, 2021) [41]	Cambiar la evaluación: Un imperativo en tiempos de incertidumbre	Ecuador	Evaluación, evaluación del aprendizaje, evaluación para el aprendizaje, educación superior, profesorado, investigación cualitativa.	Habilidades de comunicación verbal y escrita, aprendizaje autónomo, creatividad, pensamiento crítico
11	(Cañas, 2019) [42]	ABP: reestructurando los laboratorios de química	Spain	Autoaprendizaje, trabajo práctico, competencias para la vida, estrategias de investigación, formación profesional.	Retroalimentación para orientar su propuesta, habilidad para trabajar en equipo, confianza en sí mismo, ética profesional
12	(Giayetto, 2020) [43]	Virtual modality in a medical career discipline in times of pandemic: students' perceptions	Spain	Student perception, virtual modality, medical career, pandemic.	Positive aspects: Availability of time to organize oneself and be able to study at one's own pace, self-learning.
13	(Lozano, 2021) [44]	Evaluation of learning through educational multimodality, case study: Administrative Accounting group.	Costa Rica	Learning assessment, educational multimodality, self-regulation, meaningful learning, multimodal assessment.	Educational multimodality, reducing the failure rate, teamwork, case studies, etc.

Table 4. Scientific evidence on autonomous learning in higher education students, identifying instrument, approach, strategies and conclusions.

	Instrument	Approach	Strategies	Conclusions
1	MSLQ Scale (Motivated Strategies for Learning Questionnaire), Skaalvik Goal Orientation Scale, Self-Regulation of Learning Processes Inventory	Quantitative	A virtual accompaniment program was implemented through the Moodle platform. The quasi-experimental approach to the process consisted of providing additional and diverse content, as well as facilitating interaction in the forums via chat, three times a week. The teacher's role was focused on acting as a mediator during the process.	The accompaniment program demonstrated its effectiveness, since the students who participated in the experimental group experienced a significant increase in the processes of self-regulation of learning in general. Specifically, an increase in goal orientation towards knowledge acquisition, interest in the subject, use of learning strategies, use of technological tools and study time was observed. In addition, there was evidence of an improvement in self-regulation strategies for learning and in the perception of teacher support in training tasks.
2	Questionnaire	Quantitative	A survey was conducted by means of a 20-question questionnaire, addressed to a sample of 133 students. To collect the information, the survey technique was used and a digital questionnaire created on the Google Forms platform was chosen. This choice allowed reaching a larger number of students in an efficient manner.	There is a direct relationship between academic self-regulation and autonomous learning, i.e., as academic self-regulation increases, autonomous learning also increases. Similarly, it was observed that as autonomous learning increases, so does academic self-regulation..
3	MSLQ Questionnaire	Quantitative	The MSLQ Scale was used to assess self-regulated learning, and a strong focus on social and academic aspects was observed. In terms of strategy development, the importance of concentration was emphasized, as it involves understanding, asking questions and staying alert.	The promotion of perceived social and academic support from family and friends of adolescents is a valid recommendation to indirectly impact self-regulated learning. In this way, social and academic supports should be encouraged, with the objective of influencing the development of self-regulated learning skills.
4	Semi-structured Questionnaire	Qualitative	A semi-structured questionnaire was used to obtain the opinion of 38 teachers of subjects that employ a Learning Management System (LMS) in distance students of the School of Social Sciences and Humanities of the university where the study was carried out. The objective was to investigate the teachers' perception of the improvement in the development of the subjects through the strategies they employ to promote autonomous learning.	The importance of collaborative work in autonomous learning is highlighted, as well as the lack of methodological knowledge and application of strategies in subjects through LMS platforms. The need for training processes to reduce the existing bias is also highlighted. Teachers demonstrate a clear understanding of what autonomous learning implies, where the main role of the student as responsible for his/her own learning process, without the constant presence of the teacher, is emphasized.
5	Questionnaires	Qualitative	It allows to verify relationships between variables (relationship analysis) between variables has been used in educational research. variables has been used in educational research and it is through this analysis that we seek to establish theoretical models based on self-regulated learning, taking into account students' perceptions of digital resources from the perspective of the Personal Learning Environment (PLE). The results are divided into two sections that address the research questions. First, students' perceptions of the digital tools involved in each phase of self-regulated learning are examined. Then, a series of theoretical models are presented that offer tools and resources for self-regulated learning in the context of students' PLE development.	The importance of integrating digital tools and resources in the learning processes is highlighted in its pedagogical foundation, and having reference models on the related metacognitive levels can improve the didactic proposals implemented. As for the results of the students' perception of gamified quizzes contrast with the critical view that associates exams with traditional approaches based on the reproduction of knowledge, and this opens new discussions on whether the social dimension can compensate for these limitations.

6	Self-Regulated Learning Scale: Survey Data Temporal Perspective Inventory (ZTPI)	Quantitative	The data were collected in group sessions during academic hours, with the prior authorization of the management team and faculty members at both universities. The questionnaires were administered in electronic format in the presence of the professor, and each session lasted approximately 45 minutes. The students were informed of the purpose of the study, their participation was voluntary and the confidentiality of the information collected was assured. The questionnaire used is for university students, it is composed of 56 items that are grouped into five temporal dimensions, which refer to the beliefs, preferences and values related to a temporal orientation.	The dimensionality analysis of the ZTPI revealed the presence of five factors identified as: (a) Negative Past, (b) Hedonistic Present, (c) Future, (d) Positive Past and (e) Fatalistic Present. The results obtained indicate that the learning-centered learning pattern is positively related to academic performance. On the other hand, maintaining a hedonistic perspective on the present and a non-directed learning pattern are negatively correlated with academic performance. These findings suggest that adopting a deep processing approach and self-regulating learning leads to better academic performance. The results obtained reveal a significant positive association between the student-centered learning pattern and academic performance.
7	"Dedication to the course" "Progress bar"	Mixed (Quantitative - Qualitative)	This tool makes it possible to visualize an estimate of the time spent studying. Initially, the tool was designed exclusively to be viewed by the teacher. However, the necessary adjustments were made to the source code of the block so that it could also be viewed by the students. In this way, the teacher was allowed to assign the display of the block to the corresponding experimental group in Moodle and hide it from the control group. The additional tool used in the research presents information visually about student participation in each of the required activities. It uses color coding that allows the student to identify which activities have been completed and which still need to be completed. For the teacher, the tool provides an overview showing the progress of all students in a group, which is useful for identifying those students at risk..	No significant difference was found in academic performance between the groups, regardless of the type of virtual classroom in which they interacted. However, significant differences were observed in the time spent and daily connections between the groups, according to the type of virtual classroom used. In conclusion, students in the group with a progress bar improved their efficiency, as they achieved similar academic results to the other students in approximately half the time.
8	Self-Regulation of Learning Scale. Parental Achievement-Oriented Goals Scale. Perceived Parental Autonomy Support Scale, P-PASS	Quantitative	An adaptation of the Self-Regulation of Learning Questionnaire (SRQ-L), which consists of two subscales: Autonomous Regulation and Controlled Regulation, was carried out. This questionnaire was completed by adolescents. In addition, an adaptation of the Parental Achievement Goals (AGQ), an instrument consisting of 11 items evaluated on a Likert scale of seven degrees of agreement, ranging from "do not agree" (1) to "strongly agree" (7), was carried out. The Parental Achievement Goals scale addresses two dimensions: autonomy support, which includes indicators such as choice within certain limits, explanation of the reasons behind demands, rules and limits, and conscious acceptance and recognition; and psychological control, which refers to the promotion of performance goals.	There is a positive relationship between parental autonomy support and autonomous learning regulation in adolescents. This confirms that positive parenting by parents is a factor that promotes this type of learning, which is characterized by being active and self-directed, and could be associated with satisfactory academic achievement. Therefore, the need for close collaboration between the family and the school is highlighted so that parents reinforce the type of parental behavior that facilitates the student's participation as a protagonist in his or her learning process.
9	Teaching climate scale conducive to university student learning (ECEFAE)	Mixed (Quantitative - Qualitative)	This instrument (ECEFAE) was developed to diagnose the teaching climate. This instrument consists of 12 variables and 60 indicators, with 5 items for each variable. The validation of the ECEFAE instrument was carried out using	It is evident that the teaching climate does not adequately favor learning. Among the variables evaluated, those that obtained the best scores, at a medium level, were autonomous learning, organization and discipline, and cooperative learning. On the other hand, the

			two approaches to verify its external and internal consistency. First, a pilot test was carried out with students from different faculties and careers at the university to evaluate the understanding of each linguistic formulation of the instrument and make the necessary adjustments. Then, Cronbach's Alpha coefficient was applied to determine the overall reliability of the questionnaire.	worst evaluated variables, at a low level, were learning assessment, environmental conditions and the theory-professional practice link. The conclusions highlight the need to consider, in future research, the comparison of teachers' and students' perspectives, as well as the combination of quantitative and qualitative approaches in climate studies to achieve a deeper diagnosis. The results of this study have been taken into account for the pedagogical training of the teaching staff. The study of variables and indicators through the application of the ECEFAE made it possible to identify the aspects that require special attention in the transition to student-centered teaching in UDA's engineering careers.
10	Semi-structured Interviews	Qualitative	More than thirty semi-structured interviews were conducted with full-time teachers who taught basic education subjects, such as Sustainability and Environmental Culture, Introduction to Mathematical Thinking, and Academic Literacy. In addition to the interviews, student interviews and classroom observations were included as part of the methodology used.	It was noted that learning assessment is characterized as an individualized and context-dependent practice. It was identified that the lack of teacher training influences assessment conceptions and practices, and an incipient development of participatory forms of assessment was observed. In addition, the main findings reveal that assessment continues to focus on the role of the teacher and that teachers value both the mastery of disciplinary content and the skills through which students demonstrate their knowledge. After analyzing the data, efforts by faculty to expand and make learning assessment instruments more flexible were evident. However, a change in their conceptions of assessment was not observed, since the idea of an assessment oriented mainly towards certification and accountability prevails, to the detriment of an assessment focused on understanding and improving learning. This hinders the transition to an evaluation focused on learning.
11	Surveys/Measuring instrument Semi-structured interviews	Qualitative	Students expressed their opinions using a Likert scale, in which a value of 1 represents complete disagreement and a value of 5 indicates complete agreement. The study collected both quantitative and qualitative information by including both closed and open-ended questions. The research is framed within an interpretive socioconstructivist approach and uses a mixed methodology. The sample consisted of students over 18 years of age who were in their second year of study. Participation in the survey was anonymous and voluntary. On the paper form, students were asked to indicate their consent to answer the survey/questionnaire. All students who completed the course, regardless of whether they were promoted or not, responded to the survey.	The questions were examined for comprehension, coherence and relevance to the desired measure. As a result of this validation process, two questions were reformulated and one was eliminated, leaving a total of eleven closed-ended questions and four open-ended questions. The overall results with our students are promising. Both the surveys and the opinions expressed in interviews (conducted with both students who have passed the course and those who have not) and personal conversations with former students who have gone through the same experience confirm that, although they may express dissatisfaction at the time with the effort required, they also value the learning that comes from the effort. Preparing our students to be able to self-regulate their learning is a challenge we must accept.
12	Questionnaire	Mixed (Quantitative - Qualitative)	The objective of this study was to know the opinion and the difficulties perceived by the students of Microbiology and Parasitology of the Medical School of the National University of Villa María in Córdoba, Argentina, with respect to this drastic change to the virtual modality.	The learning contexts, the planning of teaching and learning situations should be taken into account in order to favor self-regulation of learning in higher education. Likewise, it is highlighted that the collection of previous knowledge, the interaction between teacher and students, the collaborative work among students, the activities of feedback of learning by the

				teacher with their respective counseling or tutoring strengthens the academic performance of students and generates favorable conditions for the self-regulation of their learning.
13	Interview Questionnaire	Mixed (Quantitative - Qualitative)	Through the application of the group interview technique and an individual satisfaction questionnaire, information was collected from a group of 36 students of the Administrative Accounting course of the Bachelor's Degree in Financial Administration. These students expressed their dissatisfaction with the learning and evaluation process. The main objective was to analyze the evaluation of learning, beginning by examining the structure of the evaluation process and determining the extent to which it was used during the period in which the subject was taught.	The results obtained from the application of educational multimodality revealed a 94% improvement in the group's learning. In addition, a decrease in the failure rate to 8% was observed. The implementation of self-regulation, together with self-assessment, reached a development level of 95%, which contributed to its perception as a tool allied to learning and to significant progress in autonomous learning. This case study demonstrated the students' capacity to acquire knowledge, which implies that teachers should seek and adapt educational strategies and models that facilitate the learning process. In addition, it is important that these strategies be attractive to motivate students' study and dedication, and the paradigm that exams should be intimidating and rigid should be eliminated.

CONCLUSION AND DISCUSSION

The objective of the study was to systematize the evidence of the scientific literature in relation to autonomous learning, considering the strategies and skills put into practice by university students to develop autonomy in their learning. The study concluded that pedagogical mediation, through counseling, tutoring and teacher support, plays a decisive role in the generation of favorable conditions for the development of planning skills, concentration, motivation and reflection on their own learning of university students [33].

For the development of learning autonomy, evidence from scientific literature reveals that teachers use as main didactic strategies: collaborative work, self-regulation of learning and self-evaluation of academic activities in teaching scenarios mediated by learning technologies in order for students to control the process and achievement of their learning goals and results [38]. In this context, it is relevant to highlight the role of the university teacher to generate motivating, challenging and contextualized teaching situations in virtual learning environments in order to ensure that their students strengthen planning, monitoring and self-evaluation or self-reflection activities of the processes of acquiring knowledge, skills and attitudes in their professional training.

The teacher's performance has been fundamental in the development of autonomous learning skills in higher education, which is why, faced with the difficulties of virtual education in which the student does not have the physical presence of the teacher, it has been necessary to implement training processes for higher education teachers on issues of self-regulation of learning in virtual learning environments, It has been necessary to implement training processes for higher education teachers on issues of self-regulation of learning in virtual learning environments, use of strategies and pedagogical resources that promote autonomous learning in these environments as found by Tiburcio (2021) and Lozano (2021) [40], [41], [42], [43].

The incorporation of technological tools and the use of educational platforms in virtual teaching during the pandemic have favored the design of educational material, organization, follow-up, monitoring, evaluation and feedback of academic activities in virtual learning environments [44].

Finally, scientific evidence reports the relevance of social academic support by friends or students who are part of collaborative work teams in learning activities within professional training, friends who exert academic influence and who are not directly part of the student's university context and family support exert a mediating role in the development of self-regulation skills and learning autonomy in higher education [34], [35].

REFERENCES

[1] Ortega-Cortez A, Espinoza-Navarro O, Ortega A, Brito-Hernández L. Rendimiento académico de estudiantes universitarios en asignaturas de las ciencias morfológicas: uso de aprendizajes Activos Basados en Problemas (ABP). International Journal of Morphology 2021;39:401–6. https://doi.org/10.4067/S0717-95022021000200401.

[2] Fernández-Molina M, González V, del Molino G. Perfil del alumnado universitario de Educación Infantil. Un estudio descriptivo desde los inicios del Espacio Europeo de Educación Superior hasta los Estudios de Grado (2006-2010). Revista de Investigación Educativa 2011;29:187–203.

[3] Tejada J, Ruiz C. Evaluación de competencias profesionales en educación superior: retos e implicaciones. Educación XX1 2016;19:17–38. https://doi.org/10.5944/educxx1.12175.

[4] Olmedo E. Enfoques de aprendizaje de los estudiantes y metodología docente: Evolución hacia el nuevo sistema de formación e interacción propuesta en el EEES. Revista de Investigación Educativa 2013;31:411–29. https://doi.org/10.6018/rie.31.2.133501.

[5] Zambrano C, Díaz A, Perez M, Rojas D. Análisis de estrategias de autorregulación en estudiantes de pedagogía de una universidad chilena. Formación Universitaria 2020;13:223–32. https://doi.org/10.4067/S0718-50062020000500223.

[6] Benson P. Teaching and researching: autonomy in language learning. 2nd ed. London: Routledge; 2013. https://doi.org/10.4324/9781315833767.

[7] Dang T. Learner Autonomy: A Synthesis of Theory and Practice. The Internet Journal of Language, Culture and Society 2012:52–67.

[8] Vázquez L, Hernández M. Alumnos en pandemia: una mirada desde el aprendizaje autónomo. RDU 2021;22:1–10. https://doi.org/10.22201/cuaieed.16076079e.2021.22.2.11.

[9] Jam, F.A., Khan, T.I., Zaidi, B., & Muzaffar, S.M. (2011). Political Skills Moderates the Relationship between Perception of Organizational Politics and Job Outcomes. [10] Killen R. Effective teaching strategies: lessons from research and practice. 6th ed. South Melbourne, Vic.: Cengage Learning Australia; 2013.

[11] Little D. Learner autonomy. 1: Definitions, issues and problems. Dublin: Authentik Language Learning Resources; 1991.

[12] Peinado J. Experiencias del profesorado acerca del aprendizaje autónomo en estudiantes de modalidad a distancia y el uso de recursos digitales. RIDE Revista Iberoamericana para la Investigación y el Desarrollo Educativo 2020;10. https://doi.org/10.23913/ride.v10i20.645.

[13] Crispín M, Doria M, Rivera A, de la Garza M, Carrillo S, Guerrero L, et al. Aprendizaje autónomo: Orientaciones para la docencia. México: Universidad Iberoamericana; 1991.

[14] Garello M, Rinaudo M. Autorregulación del aprendizaje, feedback y transferencia de conocimiento. Investigación de diseño con estudiantes universitarios. Revista Electrónica de Investigación Educativa 2013;15:131–47.

[15] Little D, Dam L, Legenhausen L. Language learner autonomy: Theory, practice and research. Ireland: Trinity College; 2017. https://doi.org/10.21832/LITTLE8590.

[16] Ponce E, Acosta D, Buendía G. El modelo instruccional ASSURE como herramienta para el aprendizaje autónomo en tiempos de crisis. Revista Conrado 2021;17:428–35.

[17] Talavera F, Hurtado-Mazeyra A, Ponce E, Moscoso C, Bustamante T. La flexibilidad como elemento de cambio para la creatividad e innovación en el aula universitaria. RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao 2019;2019:81–92.

[18] Quinteros C, Migone D. ¿Cómo aprende la Gen Z y qué esperan de la educación? Observatorio / Instituto para el Futuro de la Educación 2020. https://observatorio.tec.mx/edu-bits-blog/generacion-z-expectativas-educacion/ (accessed August 30, 2023).

[19] Suyo-Vega J, Polonia A, Miotto A. Revisión sistemática sobre aprendizaje autónomo universitario a través de la virtualidad. 3C TIC 2021;10:17–47. https://doi.org/10.17993/3ctic.2021.102.17-47.

[20] Román J. La educación superior en tiempos de pandemia: una visión desde dentro del proceso formativo. Revista Latinoamericana de Estudios Educativos 2020;50:13–40. https://doi.org/10.48102/rlee.2020.50.ESPECIAL.95.

[21] Pereira J, Jiménez M, Cubero A, Quesada R, Jiménez S. Desarrollo de las habilidades de pensamiento crítico, creatividad e innovación y resolución de problemas en Ciencias noveno año, Costa Rica. Revista Electrónica Calidad en la Educación Superior 2021;12:308–37. https://doi.org/10.22458/caes.v12i1.3560.

[22] Cangalaya L. Habilidades del pensamiento crítico en estudiantes universitarios a través de la investigación. Desde El Sur 2020;12:141–53. https://doi.org/10.21142/des-1201-2020-0009.

[23] Martínez-Sánchez L, Molina-Valencia J, Rodríguez-Padilla L, Ruiz-Rodríguez J, Jaramillo-Jaramillo L. Relación entre formación investigativa, fortalecimiento del aprendizaje autónomo y gestión del tiempo en educación médica de pregrado. Revista Electrónica Educare 2022;26:1–21.

[24] Roque Y, Valdivia P, García S, Zagalaz M. Metacognición y aprendizaje autónomo en la Educación Superior. Educación Médica Superior 2018;32:293–302.

[25] Kramarski B, Michalsky T. Investigating preservice teachers' professional growth in self-regulated learning environments. Journal of Educational Psychology 2009;101:161–75. https://doi.org/10.1037/a0013101.

[26] Rezende F, da Fonseca L, Nunes V, da Silva G, Antas L. A student-centered approach for developing active learning: the construction of physical models as a teaching tool in medical physiology. BMC Medical Education 2014;14:189–98. https://doi.org/10.1186/1472-6920-14-189.

[27] López M. Diseño y análisis del Cuestionario de Estrategias de Trabajo Autónomo (CETA) para estudiantes universitarios. Revista de Psicodidáctica 2010;15:77–99.

[28] Linares E, Hernández V, Domínguez J, Fernández S, Hevia V, Mayor J, et al. Metodología de una revisión sistemática. Actas Urológicas Españolas 2018;42:499–506. https://doi.org/10.1016/j.acuro.2018.01.010.

[29] Hutton B, Catalá F, Moher D. La extensión de la declaración PRISMA para revisiones sistemáticas que incorporan metaanálisis en red: PRISMA-NMA. Med Clin (Barc) 2016;147:262–6. https://doi.org/10.1016/j.medcli.2016.02.025.

[30] Urrútia G, Bonfill X. Declaración PRISMA: una propuesta para mejorar la publicación de revisiones sistemáticas y metaanálisis. Med Clin (Barc) 2010;135:507–11. https://doi.org/10.1016/j.medcli.2010.01.015.

[31] Page M, McKenzie J, Bossuyt P, Boutron I, Hoffmann T, Mulrow C, et al. Declaración PRISMA 2020: una guía actualizada para la publicación de revisiones sistemáticas. Revista Española de Cardiología 2021;74:790–9. https://doi.org/10.1016/j.recesp.2021.06.016.

[32] Martinez-Sarmiento L, Gaeta-Gonzalez M. Use of Moodle virtual platform for the development of self-regulated learning in university students. EDUCAR 2019;55:479–98. https://doi.org/10.5565/rev/educar.883.

[33] Puya A, Ruiz Y, Garcia M. Academic self-regulation and autonomous learning of the Basic Education Major at University Estatal Peninsula de Santa Elena. Revista Ciencias Pedagógicas e Innovación 2021;9:33–9. https://doi.org/10.26423/rcpi.v9i2.426.

[34] Gaxiola J, Gonzalez S. Perceived support, resilience, goals,and self-regulated learning in high school students. Revista Electrónica de Investigación Educativa 2019;21:1–10. https://doi.org/10.24320/redie.2019.21.e08.1983.

[35] Vargas-Cubero A, Villalobos-Torres G. Teaching strategies to promote autonomous learning in university students by means of Learning Management Systems (LMS). Revista Electrónica Calidad en la Educación Superior 2019;10:215–46. https://doi.org/10.22458/caes.v10i2.2715.

[36] Tur G, Ramirez-Mera U, Marín VI. Self-regulated learning and personal learning environments in pre-service teacher education: students' perceptions and proposals for tools and resources. Revista Complutense de Educación 2022;33:41–55. https://doi.org/10.5209/rced.71002.

[37] Gaeta M, Reyes M, Gonzalez M, Garcia-Bejar L, Espinosa M, Gutierrez M, et al. Time perspective, learning patterns and academic achievement in mexican university students. Estudios sobre Educación 2020:9–31. https://doi.org/10.15581/004.39.9-31.

[38] Garcia-Marcos C, Lopez-Vargas O, Cabero-Almenara J. Self-regulated learning in online vocational education and training: effects of time management. Revista de Educación a Distancia 2020;20:1–21. https://doi.org/10.6018/red.400071.

[39] Dolores M, Torio S, Murga-Menoyo M. Positive parenting and self-regulation of learning in adolescents. Alteridad 2022;17:291–303. https://doi.org/10.17163/alt.v17n2.2022.09.

[40] Gonzalez-Maura V, Lopez-Rodriguez A, Valdivia-Diaz J, Carvajal-Coello K. A teaching environment that favors learning. A study at the university of Atacama (Cuba) faculty of engineering. Revista Educación 2019;43:241–58. https://doi.org/10.15517/revedu.v43i2.32773.

[41] Moreno-Olivos T. Changing evaluation: A must in times of uncertainty. Alteridad 2021;16:223–34. https://doi.org/10.17163/alt.v16n2.2021.05.

[42] Cañas M. PBL: rethinking chemistry laboratories. REDU Revista de Docencia Universitaria 2019;17:25–39. https://doi.org/10.4995/redu.2019.11667.

[43] Giayetto V, Peirotti M, Aimaretto C, Vera M. Virtual mode in a discipline in the Medicine career in times of pandemic: students' perception. REDU Revista de Docencia Universitaria 2020;18:67–80. https://doi.org/10.4995/redu.2020.14040.

[44] Lozano-Montero E. A learning assessment through educational multimodality: a case study of an administrative accounting group. Revista Educación 2021;45:398–416. https://doi.org/10.15517/revedu.v45i1.41423.

DOI: https://doi.org/10.15379/ijmst.v10i4.2060