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# Perception of the learning climate and its prediction of wellbeing in psychology students at a Chilean university

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Autonomy-supportive environments have been identified as predictors of students' wellbeing and engagement. This paper aimed to examine the perception of learning climate and its predictive ability in the multidimensional wellbeing of university students. An associative and predictive approach was adopted, carried out through a cross-sectional study that included 295 students from a Chilean university. Participants completed a learning climate questionnaire and the PERMA-Profil. Results indicated that students reported moderately high levels of wellbeing in general, with the dimensions of positive relationships, engagement, and purpose showing the highest scores. Regarding learning climate, responses indicated a mostly positive perception, with scores above the midpoint on the scale. No significant differences were found in wellbeing or perception of learning climate according to academic year. However, a significant interaction effect between gender and learning climate was found for overall multidimensional wellbeing,  $F(1, 286) = 4.67, p = 0.032, \eta^2 = 0.016$ . Men in the high learning climate group showed higher wellbeing than women, while women in the low climate group outperformed men in the same group. Additionally, significant gender differences were observed in the engagement dimension,  $F(1, 286) = 11.23, p < 0.001, \eta^2 = 0.033$ , with men in the high learning climate group reporting higher engagement, and women in the low learning climate group showing higher engagement than their male counterparts. Perception of learning climate explained a significant amount of the variance in all dimensions of wellbeing. These findings highlight the importance of promoting learning environments that foster autonomy and teacher support, and suggest that the learning climate may have different impacts on wellbeing depending on gender.

## KEYWORDS

subjective wellbeing, psychological wellbeing, autonomy support, higher education, flourishing

## 1 Introduction

During their university years, young people experience situations that enable them to train and become professionally competent. They also could develop positive aspects related to their personal growth and motivation. Some students encounter difficulties in academic performance, which result in wellbeing issues and success in their university careers (Appleseth et al., 2023). The literature on higher education suggests that teacher autonomy support can promote educational success and student motivation (Okada, 2023). Therefore, the goal of educational institutions is to allow students to thrive in terms of classroom functioning, engagement, social development, and wellbeing (Ryan et al., 2023). The key to achieving this is providing conditions that allow students to satisfy their needs for autonomy, competence, and relatedness, which has subsequent benefits for learning and wellbeing (Howard et al., 2024).

Wellbeing is a construct studied from various perspectives. One is the hedonic perspective, which emphasizes overall life satisfaction, including domains such as work, academics, and relationships (Diener and Ryan, 2009). From this perspective, wellbeing can be described as the subjective evaluation that individuals make of their life experiences and the emotions associated with them (Passeggia et al., 2023). Therefore, it refers to subjective happiness, enjoyment, and pleasure in life (Auyeung and Han Mo, 2019).

Another perspective that has studied wellbeing is eudaimonia, which involves personal growth, purpose, and orientation toward self-realization (Ryan and Deci, 2006; Ryff, 1989). In this perspective, psychological wellbeing is considered a multidimensional construct associated with elements of engagement, meaning, and life achievements (Auyeung and Han Mo, 2019; Barra Almagia, 2012; Passeggia et al., 2023). Thus, psychological wellbeing can be explained as the positive functioning of individuals with their environment and high levels of satisfaction in various life spheres (Ryff and Keyes, 1995).

This study considers the PERMA model of wellbeing formulated by Seligman (2018) to address the construct. This theoretical perspective explains wellbeing as a multidimensional construct with eudaimonic and hedonic components, including positive emotions (P), engagement (E), relationships (R), meaning (M), and accomplishment (A). In the general population, PERMA components have been positively associated with overall satisfaction, job satisfaction, and positive effects, and negatively associated with negative effects (Cabrera and Donaldson, 2023). In the university student population, the components of PERMA have been associated with autonomy, resilience, flourishing, physical health, vitality, and character strengths such as curiosity, love of knowledge, gratitude, and love (Coffey et al., 2016; Leontopoulou, 2020).

Other perspectives consider wellbeing to include both interpersonal and intra-individual dimensions. The former refers to relationships with others, while the latter points to self-referent attitudes such as personal growth, self-beliefs, and experiences of mastery (Burns, 2017). In the Ibero-American context, PERMA has been analyzed among university students concerning interpersonal and intra-individual variables, finding significant associations between PERMA components and growth mindset, positive affects,

social interactions, overall life satisfaction, academic performance, secure attachment, university life adaptation, happiness, and indicators of physical and mental health. Conversely, negative relationships were found with academic anxiety, fixed mindset, and negative affect (Chaves et al., 2023; Cobo-Rendón et al., 2021; Umucu et al., 2024; Yang et al., 2024).

### 1.1 The role of autonomy support in promoting wellbeing and engagement in educational setting

Wellbeing has been associated with the satisfaction of basic psychological needs such as autonomy, competence, and social relationships (Mayerhofer et al., 2023; Pineda-Espejel et al., 2023). This association is addressed by the Self-Determination Theory proposed by Deci and Ryan (2000, 2002), a theoretical perspective that posits that these basic psychological needs—autonomy, competence, and relationships—need to be met to promote optimal functioning and, consequently, wellbeing.

Additionally, the theory proposes that basic psychological needs can be satisfied in interpersonal contexts that promote autonomy, enable the perception of competence through effective interaction with the environment, and foster significant social relationships (Deci and Ryan, 2000, 2002). Therefore, the type of educational context can influence students' wellbeing. However, individual and interpersonal factors, and even the type of culture—whether individualistic or collectivist—should be considered to understand wellbeing, along with differences between men and women within the same culture (Barra Almagia, 2012).

In this study, we delve into the basic psychological need for autonomy, understood as having the capacity for choice, associated with volition and self-perception that one's behaviors originate from one's own decisions (Ryan and Deci, 2017). Autonomy support, understood as the extent to which the environment enables individuals to perceive that they make decisions instead of being coerced (Grolnick, 2003). In Reeve (2016) study, applied the concept of autonomy support to teachers' motivational styles in the classroom and defined six essential aspects of teaching that support autonomy: (a) considering students' perspectives; (b) revitalizing internal motivational resources; (c) offering explanatory rationales; (d) using informational and non-pressuring language; (e) acknowledging and accepting negative affect; and (f) being patient. In summary, autonomy support refers to instructional efforts that satisfy students' need to be initiators of their behaviors (Reeve, 2016). Educational psychology research thus highlights the role of teachers in supporting students' motivation.

Autonomy has been studied concerning wellbeing and learning among university students (Holzer et al., 2021; Howard et al., 2021; Leow et al., 2023; Nalipay et al., 2020). On one hand, it has been found in motivational profiles of university students that those grouped in a profile with higher levels of learning autonomy also exhibited higher levels of academic satisfaction (Vergara-Morales et al., 2019). Additionally, it has been identified that increasing perceived autonomy support is linked to increased autonomous

motivation, with findings consistent in the opposite direction—when there is a high increase in autonomy control by the teacher, students' motivation and satisfaction diminish.

Linking constructs, autonomy support is strongly associated with the dimensions of the PERMA model (Seligman, 2018). In this case, autonomy support fosters the emergence of positive emotions in students, as it helps them develop greater perceived competence and intrinsic value toward learning activities (Berweger et al., 2021). Studies have shown that when students perceive an environment that respects their autonomy, they experience more positive emotions and a reduction in negative emotions such as stress or frustration (Meng-Ting Lo, 2021). In terms of engagement, autonomy support is closely related. According to Jiang and Tanaka (2022), students who perceive a high level of autonomy support, through the satisfaction of their psychological needs, show greater academic engagement and satisfaction with university life. This engagement is not only emotional but also behavioral and cognitive, involving active participation in the learning process. Within the same framework, another study investigated whether students' classroom engagement, in addition to being influenced by teachers' motivational styles, could also predict changes in those styles. The results showed that autonomy-supportive teaching predicted increases in student engagement across all its dimensions. Additionally, students' agentic engagement at the beginning of the semester also predicted increases in perceived teacher autonomy support, suggesting that active student engagement can influence teachers' teaching styles (Matos et al., 2018).

In the case of positive relationships within the classroom, both among peers and with faculty, these relationships foster student wellbeing. Autonomy support is linked to improved interpersonal interactions, providing an environment where students feel valued and recognized, which strengthens their support networks and sense of belonging (Wu and Xindong, 2024). This perception of support fosters healthier relationships and reduces feelings of isolation. Autonomy support is also related to a greater sense of purpose associated with wellbeing. Students who find meaning in their studies, such as those in counseling programs, tend to show higher wellbeing and greater perceived competence (Hurst and Prescott, 2021). An environment that fosters autonomy promotes meaningful and purposeful learning, motivating students to establish deeper connections between their academic goals and personal lives. Finally, academic achievements in this context are also influenced by autonomy support. A meta-analysis by Okada (2021) found that perceived autonomy support has a positive impact on academic performance and a moderate to large influence on students' autonomous motivation. Therefore, an environment that supports self-direction allows students to manage their own learning more effectively, which translates into better academic outcomes.

Autonomy support, has also been studied among university students, who are regularly exposed to deadlines, stressful situations associated with academic events and evaluations, and even competition with peers for better grades, situations that can impact their perception of autonomy. Research shows that autonomy support from parents, friends, and romantic partners is linked to university students' subjective wellbeing (Ratelle et al., 2013). Indeed, when students perceive high levels of these three sources of autonomy support, they report higher wellbeing levels.

In the academic context, it has been found that students who perceived support from their teachers and a high sense of autonomy reported greater engagement with their studies, which indirectly influences their wellbeing (Luruli et al., 2020). Certainly, an important relationship has been found between autonomy support from teachers and the satisfaction of students' basic psychological needs, as well as a decrease in anxiety and an increase in the likelihood of participation and adaptive beliefs regarding evaluation, implying self-regulated learning processes (Cho et al., 2023).

Similarly, the value of teacher support in predicting academic satisfaction has been corroborated, suggesting that autonomy support serves as a nutrient to satisfy basic psychological needs, with adaptive consequences in terms of increased participation, confidence, and student engagement, contributing to a positive relationship with intrinsic motivation (Huéscar Hernández et al., 2022). On the other hand, qualitative studies have documented that when students perceive low freedom, autonomy, competence, and relationships, anxiety ensues along with a perception of low capacity to act according to certain external demands (Tymms and Peters, 2020).

In the experience of international students, the willingness of instructors to create autonomy-supportive learning environments, that is, learning environments oriented toward responding to students' autonomy needs, allowing them to participate in classes, generating confidence in that participation, and the possibility of connecting with peers, has been explored (Cho et al., 2023). One of the strategies that enabled the perception of autonomy was the discussion of topics that students perceived as interesting and that promoted class participation, highlighting those teachers previously considered the most relevant topics for learning quality. It is important to note that these learning environments are structured; they are not unlimited opportunities for decisions or freedoms. Thus, it has been established that when students perceive they have the freedom to act autonomously and competently within a meaningful context, it brings benefits to their wellbeing.

## 1.2 The learning climate and autonomy support on university students' wellbeing and academic outcomes

In the educational context, the importance of the perception of autonomy as element related to self-regulated learning for the wellbeing of university students has also been emphasized (Hoque et al., 2023). In light of this, in the field of Science, Technology, Engineering and Mathematics (STEM), courses have been designed with strategies oriented toward motivational beliefs and learning skills, through tutoring strategies that encourage autonomy, peer relationships, and learning confidence (self-efficacy), achieved through the opening of possibilities in the choice of thematic areas of interest autonomously by the student, working in small groups, and well-established materials with various learning integration activities, to promote student wellbeing (Mayerhofer et al., 2023).

However, evidence contrary to the literature has been found, as a study in China found that perceived student autonomy in the classroom was inversely related to life satisfaction (Chen et al., 2017). The explanation was related to first-year students who had

just graduated from high school, where they were under a teaching style very oriented toward controlling student autonomy, which could affect their satisfaction upon entering university, where they encountered a learning environment that encouraged decision-making, freedom, and autonomy, which was perceived as a stressful situation for students in the adaptation process.

Another object of study in literature is the learning climate. Recent studies have explored the learning climate, specifically the type of learning climate that can be associated with a surface approach to learning among students. In this regard, it is observed that a controlling learning climate style does not enable the perception of autonomy in students, adding to uncertainties in the learning environment, which can frustrate the satisfaction of students' basic psychological needs, compromising their meaningful learning and wellbeing (Englund et al., 2023).

In this case, the learning climate, according to self-determination theory, can be either controlling or supportive, depending on how teachers manage their interactions with students. This concept encompasses elements such as the emotional and social atmosphere in which students learn, and how that atmosphere affects their motivation and engagement (Reeve, 2009). A positive learning climate is characterized by an environment that promotes engagement, emotional support, and relationship-building between students and the teacher. According to previous studies, the learning climate refers to the overall environment in which students learn, including social and emotional interactions among them and with the teacher. Sulla et al. (2023) emphasize that this climate is strongly influenced by interpersonal synchrony and teacher support, which foster critical thinking, decision-making, and problem-solving through collaborative learning. An effective learning climate should encourage shared regulation of learning, where students actively engage in knowledge construction and in managing the social and emotional challenges that arise during group learning (Hadwin et al., 2018). Thus, the learning climate can directly influence both wellbeing and academic outcomes (Sulla et al., 2023).

The learning climate, understood as the social and pedagogical environment that prevails in educational settings, plays a fundamental role in promoting student wellbeing. Various studies have established that pedagogical practices, particularly those that support autonomy, not only enhance intrinsic motivation but are also key predictors of student wellbeing. Research has shown that autonomy support, a practice in which educators encourage independent decision-making, has a positive effect on student wellbeing. Su and Reeve (2011) observed that when teachers adopt an autonomy-supportive approach, students experience higher levels of intrinsic motivation, which in turn improves their overall wellbeing. This occurs because a positive learning climate is established, where students not only feel more motivated to learn but also experience greater satisfaction in their school activities, contributing to a healthy emotional environment.

In this case, autonomy support is a more specific concept and refers to the teacher's actions that promote students' self-determination, that is, their ability to make decisions and be active agents of their own learning. Autonomy support is manifested when teachers adopt a teaching style that allows students to feel they have control over their actions by offering choices, listening to their opinions, and encouraging personal initiative (Deci et al., 1981). This type of support fosters intrinsic motivation, as students

perceive that their interests and needs are acknowledged and valued. Sulla et al. (2023) indicate that teachers can facilitate socially shared regulation of learning through strategies that promote autonomy, such as offering scaffolding, temporary supervision, and reflective questioning, allowing students to take ownership of the cognitive and emotional regulation skills necessary for academic success.

Similarly, Jiang and Tanaka (2022) pointed out that autonomy support also has a significant impact on psychological wellbeing. The fact that students feel empowered in their decisions and academic tasks creates an environment where autonomy is not just an educational practice, but a tool to promote wellbeing. This is consistent with self-determination theories (Deci and Ryan, 2000), which suggest that when the psychological needs for autonomy, competence, and relatedness are met, individuals achieve higher levels of wellbeing. Likewise, studies such as those by Soenens and Vansteenkiste (2010) and Neufeld and Malin (2020) have highlighted that the perception of autonomy in the learning environment directly impacts school satisfaction and emotional wellbeing. These studies conclude that an environment that facilitates autonomy, competence, and positive relationships generates a more satisfying educational experience, contributing to a more balanced and positive emotional state. Additionally, Gutiérrez and Tomás (2019) emphasized the relationship between perceived autonomy support and academic performance, indicating that student wellbeing not only improves their subjective wellbeing experience but also influences their engagement and performance in the classroom, reinforcing the integral role of the learning climate in wellbeing. Therefore, when the learning climate provided by the teacher is oriented toward promoting autonomy, it becomes a key predictor of student wellbeing. Teachers' promotion of autonomy is a critical factor that must be considered in creating educational environments that not only foster academic success but also promote the overall wellbeing of students.

For this reason, online psychological interventions have been designed to improve the wellbeing of university students, with proven effects in reducing depressive symptoms and increasing wellbeing, flourishing, positive emotions, and the need for autonomy (Auyeung and Han Mo, 2019). It was identified that these last two constructs act as active elements of post-intervention changes, specifically explaining that the need for autonomy is a psychological mechanism associated with general health and inversely with depression, which could be sensitive to positive psychology interventions, highlighting the importance of the need for autonomy as an essential element in identity formation.

The relevance of this study lies in exploring factors that are under-researched in the Ibero-American literature, such as the learning climate from a perspective of managing the need for autonomy in educational contexts and its impact on university students' wellbeing, delving into its hedonic and eudaimonic elements from the multidimensional perspective of PERMA. Similarly, continuing to delve into the psychological processes involved in study retention and reducing students' intention to drop out of their careers, previous research has indicated that constructs related to satisfaction, engagement, autonomy, and wellbeing are related to dropout (Bernardo et al., 2022; Jenó et al., 2023; Marôco et al., 2020). Moreover, it seeks to understand how teaching methodologies impact the satisfaction of students' basic



needs and, in effect, how self-perceived autonomy in learning processes influences wellbeing.

This study aims to deepen the university student's experience, generating data that can address current training challenges. Therefore, the objective of this research is to examine the perception of the learning climate and its predictive capacity on the multidimensional wellbeing of university students. The hypothesis system guiding this study is as follows:

H1: There are differences in the learning climate and the multidimensional wellbeing of students according to the academic year.

H2: There are differences between the learning climate and the multidimensional wellbeing of students according to gender.

H3: There are differences in multidimensional wellbeing in students with high and low perceptions of the learning climate.

H4: The perception of the learning climate predicts the multidimensional wellbeing of university students.

## 2 Materials and methods

### 2.1 Design

A predictive associative methodology (Ato et al., 2013) was chosen to examine the perception of the learning climate and its predictive capacity on the wellbeing of university students. Consequently, this research is framed as a cross-sectional study, as only one measurement of the variables of interest was taken. This study was cross-sectional since the data were collected at a single point in time (Hernández Sampieri et al., 2014).

### 2.2 Participants

Responses from 295 university students majoring in Psychology (71 males, 219 females, 5 preferred not to say) from a Chilean university were analyzed. The average age was 21.35 years (SD = 2.93). Table 1 shows the distribution of participants according to academic year. Additionally, 71.89% indicated that this was their first experience in higher education. An accidental non-probability sampling method was used, based on the availability of students present in the classrooms at the time of questionnaire administration. Assuming a 95% confidence level ( $\alpha = 0.05$ ) and a statistical power of 80% ( $1 - \beta = 0.80$ ), the expected effect size for the analyses was estimated. In the case of *t*-tests and ANOVA, the required sample size depends on the effect size expected to be observed. Since this study compares groups based on variables such as gender and academic year, a sample of 295 participants is adequate to detect small to moderate effect sizes (Cohen, 1988).

TABLE 1 Description of participants by year of university entry.

Year of entry	Frequency	Percentage
2019	33	11.2
2020	78	26.4
2021	102	34.6
2022	82	27.8
Total	295	100.0

## 2.3 Instruments

### 2.3.1 Learning climate

The Learning Climate Questionnaire (LCQ; Williams and Deci, 1996) consists of 15 items responded to on a Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). This questionnaire assesses the degree to which participants perceive their leader (e.g., professor, coach) promotes their autonomy. Higher scores indicate greater autonomy support from the professor. It is a unifactorial questionnaire with adequate psychometric properties for use in university students ( $S-B\chi^2/df = 2.17$ ,  $S-B\chi^2 = 195.49$ ,  $df = 90$ ,  $RMSEA = 0.058$ ,  $CFI = 0.99$ ). Item factor loadings ranged from 0.25 to 0.81, all significant. The reliability of this scale has been  $\alpha = 0.93$  (Matos Fernández, 2009).

### 2.3.2 PERMA profiler

The PERMA-Profiler is an instrument designed to assess wellbeing in multiple dimensions based on the PERMA theory. It consists of 23 questions addressing five key aspects of wellbeing: positive emotions, engagement, relationships, meaning, and achievement. Additionally, it incorporates items contrasting with negative emotions, feelings of loneliness, and health perception. Participants respond on a Likert scale from 0 to 10. Psychometrically, the five-dimensional structure has been confirmed in its original version ( $RMSEA = 0.06$ ,  $SRMR = 0.03$ ,  $CFI = 0.97$ ,  $TLI = 0.96$ ,  $\chi^2 = 10.606$ ,  $DF = 80$ ) (Kern et al., 2015). In terms of reliability among university students, internal consistency values range from  $\alpha = 0.73$  to  $\alpha = 0.90$  for individual dimensions and from  $\alpha = 0.92$  to  $\alpha = 0.94$  for the complete scale (Kern et al., 2015). In the Chilean validation, the factorial structure of the instrument was maintained ( $RMSEA = 0.054$ ,  $CFI = 0.94$ ,  $TLI = 0.95$ ,  $\chi^2 = 411.953$ ,  $DF = 80$ ) with reliability indices ranging from  $\alpha = 0.40$  to  $\alpha = 0.87$  for dimensions and  $\alpha = 0.91$  for the total scale (Cobo-Rendón et al., 2020).

## 2.4 Procedure

This study is part of a larger project titled "Academic Emotions, Wellbeing, and Autonomy Support as Predictors of Adaptation and Intention to Drop Out in University Life," evaluated by the Ethics Committee of the University of Development, Chile. The researchers contacted the authorities of the Faculty of Psychology to explain the study details and obtain approval to administer the questionnaires in their courses, ensuring a high response rate. Some researchers personally attended classrooms to inform students about the study and request their participation. Then, students

were invited to complete the questionnaires via QR codes after reading and signing an informed consent. The average response time was 15 min, and no incentives were offered for participation. This research was evaluated and approved by the Ethics Committee of the University of Development on October 4, 2022.

## 2.5 Data analysis plan

The collected data were stored in a Google form for management. Descriptive and central tendency analyses were conducted on the variables of the learning climate and wellbeing with their dimensions. The reliability of the responses was evaluated using Cronbach's alpha coefficient and McDonald's omega coefficient. Inferential analyses (Student's *t*-tests and ANOVA) were performed to examine differences in the scores of the variables of interest according to gender and academic year. Linear regression analysis was conducted to identify the predictive capacity of the perception of the learning climate on multidimensional wellbeing and its dimensions. The fulfillment of statistical assumptions for the use of these tests was verified. The data were analyzed using JASP 0.16 and Power BI.

## 3 Results

Below are the results of the evaluation of the learning climate and wellbeing of university students to address the objective of this work, which is to examine the perception of the learning climate and its predictive capacity on the wellbeing of university students.

When evaluating the average wellbeing scores, it was found that the highest scores were in the dimensions of positive relationships, followed by engagement and purpose, respectively. The dimensions of positive emotions, perception of achievement, and perception of health were averaged around 4, indicating a medium level on the response scale. Overall, there is a medium-high level of wellbeing concerning the analyzed responses. Regarding the perception of the learning climate, it scored above 4, with most responses falling in the middle range of the scale. [Table 2](#) presents descriptive statistics on the scores of the dimensions of wellbeing and the perception of the learning climate.

### 3.1 Learning climate and student wellbeing according to academic year and gender

When evaluating the students' responses with the aim of addressing the hypotheses related to significant differences in the scores of the learning climate and wellbeing based on academic year and gender (H1 and H2), the analyses performed did not reveal statistically significant differences in the perception of the learning climate or in student wellbeing based on these criteria. Independent *t*-tests by gender did not reveal significant differences in any of the evaluated dimensions (see [Table 3](#)), and in the case of ANOVA analyses by academic year, neither the perception of the learning climate nor any of the evaluated dimensions of wellbeing (positive

TABLE 2 Descriptive statistics on perception of learning climate and wellbeing.

Dimensions	Min	Max	M	SD
Positive emotions	1.33	7.00	4.978	1.308
Engagement	1.00	7.00	5.154	1.023
Positive relationships	1.00	7.00	5.339	1.281
Purpose	1.00	7.00	5.098	1.419
Achievement	1.00	7.00	4.960	1.283
Health	1.00	7.00	4.706	1.534
Negative emotions	1.00	7.00	4.135	1.220
Multidimensional wellbeing	1.07	7.00	5.106	1.102
Learning climate	1.33	7.00	4.458	1.375

Min, minimum; Max, maximum; M, mean; SD, standard deviation.

emotions, engagement, relationships, purpose, and achievement) showed significant differences (see [Table 4](#)).

### 3.2 Results of the interaction between learning climate levels and gender on wellbeing and its dimensions

The analysis of the interaction between learning climate levels and gender revealed significant effects and trends close to significance in several wellbeing dimensions. In the case of positive emotions, although a significant interaction between learning climate and gender was not found,  $F(1, 286) = 3.16$ ,  $p = 0.077$ ,  $\eta^2 = 0.010$ , the results showed a trend toward significance. Men in the high learning climate group had a higher mean in positive emotions ( $M = 5.47$ ,  $SD = 1.21$ ) compared to women ( $M = 5.29$ ,  $SD = 1.10$ ). In the low learning climate, women had a higher mean ( $M = 4.53$ ,  $SD = 1.27$ ) than men ( $M = 4.08$ ,  $SD = 1.70$ ).

Regarding the results in the engagement dimension, the interaction between learning climate and gender was significant,  $F(1, 286) = 11.23$ ,  $p < 0.001$ ,  $\eta^2 = 0.033$ . Men in the high learning climate group had a higher engagement mean ( $M = 5.63$ ,  $SD = 0.86$ ) compared to women ( $M = 5.36$ ,  $SD = 0.75$ ). However, in the low learning climate, women showed higher levels of engagement ( $M = 4.86$ ,  $SD = 1.13$ ) than men ( $M = 4.22$ ,  $SD = 1.35$ ). This suggests that the interaction between learning climate and gender has a considerable impact on engagement.

For the positive relationships dimension, although the interaction between learning climate and gender was close to significance,  $F(1, 286) = 3.58$ ,  $p = 0.060$ ,  $\eta^2 = 0.011$ , it did not reach the conventional level. Men in the high climate ( $M = 5.64$ ,  $SD = 0.99$ ) had a slightly higher mean in positive relationships than women ( $M = 5.62$ ,  $SD = 1.12$ ). However, differences between men and women in the low climate were not significant, although men had slightly lower scores ( $M = 5.05$ ,  $SD = 1.40$ ).

In the case of the purpose dimension, the interaction between learning climate and gender was not significant,  $F(1, 286) = 3.115$ ,  $p = 0.079$ ,  $\eta^2 = 0.009$ , although a trend toward significance was observed. In the high climate, men ( $M = 5.79$ ,  $SD = 1.19$ ) had

TABLE 3 Evaluation of differences by participants' gender in the perception of learning climate and wellbeing dimensions.

Dimension	Gender	N	Mean	Standard deviation	Standard error	t-value (df)	p-value
Learning climate	Male	71	46.178	14.451	0.1715	1.027 (288)	0.305
	Female	219	44.247	13.553	0.0916		
Positive emotions	Male	71	50.000	15.317	0.1818	0.051 (288)	0.959
	Female	219	49.909	12.249	0.0828		
Engagement	Male	71	51.549	12.381	0.1469	-0.057 (288)	0.955
	Female	219	51.629	0.9446	0.0638		
Positive relationships	Male	71	52.207	13.225	0.1570	-1.009 (288)	0.314
	Female	219	53.973	12.679	0.0857		
Purpose	Male	71	52.254	15.510	0.1841	0.808 (288)	0.420
	Female	219	50.685	13.780	0.0931		
Achievement	Male	71	50.516	13.173	0.1563	0.615 (288)	0.539
	Female	219	49.437	12.749	0.0861		
Health	Male	71	48.592	14.818	0.1759	0.862 (288)	0.390
	Female	219	46.788	15.484	0.1046		
Negative emotions	Male	71	40.610	13.759	0.1633	-0.583 (288)	0.560
	Female	219	41.583	11.667	0.0788		
Multidimensional wellbeing	Male	71	51.305	12.472	0.1480	0.118 (288)	0.906
	Female	219	51.126	10.558	0.0714		

Degrees of freedom 288.

higher purpose scores than women ( $M = 5.41$ ,  $SD = 0.86$ ). In the low climate, women ( $M = 4.66$ ,  $SD = 1.16$ ) outperformed men ( $M = 4.13$ ,  $SD = 1.61$ ).

Regarding the achievement dimension, no significant interaction between learning climate and gender was found in this dimension,  $F(1, 286) = 0.634$ ,  $p = 0.427$ ,  $\eta^2 = 0.002$ . However, the descriptive results showed that men in the high climate ( $M = 5.45$ ,  $SD = 0.93$ ) had slightly higher scores than women ( $M = 5.31$ ,  $SD = 0.86$ ), while in the low climate, women ( $M = 4.39$ ,  $SD = 1.16$ ) outperformed men ( $M = 4.26$ ,  $SD = 1.30$ ) (see Table 5).

For the additional dimensions of the PERMA Profiler, in the case of the health dimension, the interaction between learning climate and gender was not significant,  $F(1, 286) = 0.039$ ,  $p = 0.843$ ,  $\eta^2 < 0.001$ . Men in the high climate ( $M = 5.18$ ,  $SD = 1.36$ ) and women in the same group ( $M = 5.03$ ,  $SD = 1.36$ ) did not show substantial differences. Similarly, in the low climate, the means between men ( $M = 4.22$ ,  $SD = 1.54$ ) and women ( $M = 4.15$ ,  $SD = 1.68$ ) were very similar. Finally, for negative emotions, although the interaction between learning climate and gender was not significant,  $F(1, 286) = 2.600$ ,  $p = 0.108$ ,  $\eta^2 = 0.009$ , the descriptive results indicated that men in the high climate ( $M = 4.08$ ,  $SD = 1.49$ ) had slightly higher negative emotions than women ( $M = 3.96$ ,  $SD = 1.12$ ). In the low climate, women ( $M = 4.46$ ,  $SD = 1.27$ ) reported higher levels of negative emotions compared to men ( $M = 4.03$ ,  $SD = 1.70$ ) (see Table 5).

Regarding the results for the multidimensional wellbeing variable, a significant interaction was found between learning

climate and gender,  $F(1, 286) = 4.671$ ,  $p = 0.032$ ,  $\eta^2 = 0.016$ . Men in the high climate ( $M = 5.60$ ,  $SD = 0.93$ ) had higher multidimensional wellbeing scores compared to women ( $M = 5.41$ ,  $SD = 0.86$ ). In the low climate, women ( $M = 4.66$ ,  $SD = 1.16$ ) outperformed men ( $M = 4.22$ ,  $SD = 1.30$ ), highlighting the influence of the learning climate on the perception of multidimensional wellbeing by gender. In this case, the results show that the interaction between learning climate and gender has a significant impact on the dimensions of engagement and multidimensional wellbeing, with trends in other dimensions such as positive emotions, purpose, and positive relationships. Women and men respond differently to the learning climate in terms of wellbeing.

### 3.3 Differences in wellbeing among students with high and low perception of learning climate

To address the hypothesis regarding differences in wellbeing among students with high and low perceptions of the learning climate (H3), participants' responses were initially divided into two groups, "high" and "low." This dichotomization of learning climate perceptions was based on the cutoff points derived from the response scale used, providing empirical justification for this categorization. Specifically, the lower average response values (1 to 3.99) were grouped as low perceptions, while the higher average response values (4 to 7) were considered high perceptions. Since the response scale ranged from 1

TABLE 4 Descriptive statistics and ANOVA for learning climate and wellbeing dimensions.

Dimension	Academic year	N	Mean	Standard deviation	F (df)	Sig. (p)
Learning climate	2019	33	44.646	13.416	0.026 (3, 291)	0.994
	2020	78	44.376	12.680		
	2021	102	44.876	14.466		
	2022	82	44.407	14.204		
	Total	295	44.588	13.756		
Positive emotions	2019	33	50.909	11.064	0.157 (3, 291)	0.925
	2020	78	49.103	13.630		
	2021	102	49.967	13.919		
	2022	82	49.756	12.415		
	Total	295	49.785	13.087		
Engagement	2019	33	52.626	0.8155	0.509 (3, 291)	0.676
	2020	78	50.855	0.9691		
	2021	102	51.046	11.745		
	2022	82	52.398	0.9533		
	Total	295	51.548	10.238		
Positive relationships	2019	33	53.838	10.708	0.233 (3, 291)	0.873
	2020	78	53.932	11.606		
	2021	102	53.627	13.716		
	2022	82	52.398	13.671		
	Total	295	53.389	12.817		
Purpose	2019	33	54.040	13.611	0.916 (3, 291)	0.434
	2020	78	51.923	14.086		
	2021	102	50.261	14.949		
	2022	82	49.756	13.566		
	Total	295	50.983	14.195		
Achievement	2019	33	52.424	10.351	0.972 (3, 291)	0.406
	2020	78	49.487	12.860		
	2021	102	50.033	14.060		
	2022	82	48.049	12.092		
	Total	295	49.605	12.838		
Health	2019	33	5.020	1.236	0.780 (3, 291)	0.506
	2020	78	4.791	1.566		
	2021	102	4.588	1.573		
	2022	82	4.646	1.566		
	Total	295	4.706	1.534		
Negative emotions	2019	33	4.283	0.917	2.468 (3, 291)	0.062
	2020	78	3.816	1.270		
	2021	102	4.235	1.244		
	2022	82	4.256	1.216		
	Total	295	4.136	1.221		
Multidimensional wellbeing	2019	33	5.277	0.939	0.341 (3, 291)	0.796
	2020	78	5.106	1.085		
	2021	102	5.099	1.237		
	2022	82	5.047	1.012		
	Total	295	5.106	1.103		



TABLE 5 Descriptive statistics of scores according to the level of perception of learning climate and gender.

Dimension	Learning climate level	Gender	Mean	Standard deviation
Positive emotions	High	Male	5.47	1.21
	High	Female	5.29	1.10
	Low	Male	4.08	1.70
	Low	Female	4.53	1.27
Engagement	High	Male	5.63	0.86
	High	Female	5.36	0.75
	Low	Male	4.22	1.35
	Low	Female	4.86	1.13
Positive relationships	High	Male	5.64	0.99
	High	Female	5.62	1.12
	Low	Male	5.05	1.40
	Low	Female	5.05	1.40
Purpose	High	Male	5.79	1.19
	High	Female	5.41	0.86
	Low	Male	4.13	1.61
	Low	Female	4.66	1.16
Achievement	High	Male	5.45	0.93
	High	Female	5.31	0.86
	Low	Male	4.26	1.30
	Low	Female	4.39	1.16
Health	High	Male	5.18	1.36
	High	Female	5.03	1.36
	Low	Male	4.22	1.54
	Low	Female	4.15	1.68
Negative emotions	High	Male	4.08	1.49
	High	Female	3.96	1.12
	Low	Male	4.03	1.70
	Low	Female	4.46	1.27
Multidimensional wellbeing	High	Male	5.60	0.93
	High	Female	5.41	0.86
	Low	Male	4.22	1.30
	Low	Female	4.66	1.16

(Strongly disagree) to 7 (Strongly agree), this dichotomization consistently reflects a differentiation between students who expressed agreement or disagreement with the statements related to the learning climate. Subsequently, an independent samples *t*-test analysis was conducted to identify differences in wellbeing levels between the two groups. This analysis revealed differences in all levels of wellbeing. Students with a high perception of the learning climate exhibited more positive emotions, engagement, positive relationships, and achievements than those

who reported a low perception of the learning climate, resulting in higher total wellbeing and health perception scores. It was also identified that students with a low perception of the learning climate had higher scores of negative emotions (see Table 6).

Upon analyzing the percentages of students with high and low perceptions of the learning climate according to the dimensions of wellbeing, we found that a high perception of the learning climate is associated with higher levels of positive emotions, engagement, relationships, meaning, achievement, and health. Conversely, a low perception is associated with lower levels of wellbeing. Specifically, the greatest difference between high and low perceptions of the learning climate was identified in the dimension of Engagement, with a difference of 80.34%. This suggests that individuals' engagement is the dimension most affected by climate perception and, therefore, can be considered the most relevant in this context (see Figure 1).

### 3.4 Predicting the perception of learning climate on university students' wellbeing

To address hypothesis H4, which posits that the perception of the learning climate predicts university students' wellbeing, the correlation levels between the scores of wellbeing dimensions and the perception of the learning climate were initially evaluated. Statistically significant associations were identified in all wellbeing dimensions with the perception of the learning climate. The strongest associations were found in the purpose dimension and total wellbeing. The weakest associations were found in the positive relationships and health perception dimensions. Inverse associations were identified between the perception of the learning climate and negative emotions (see Table 7).

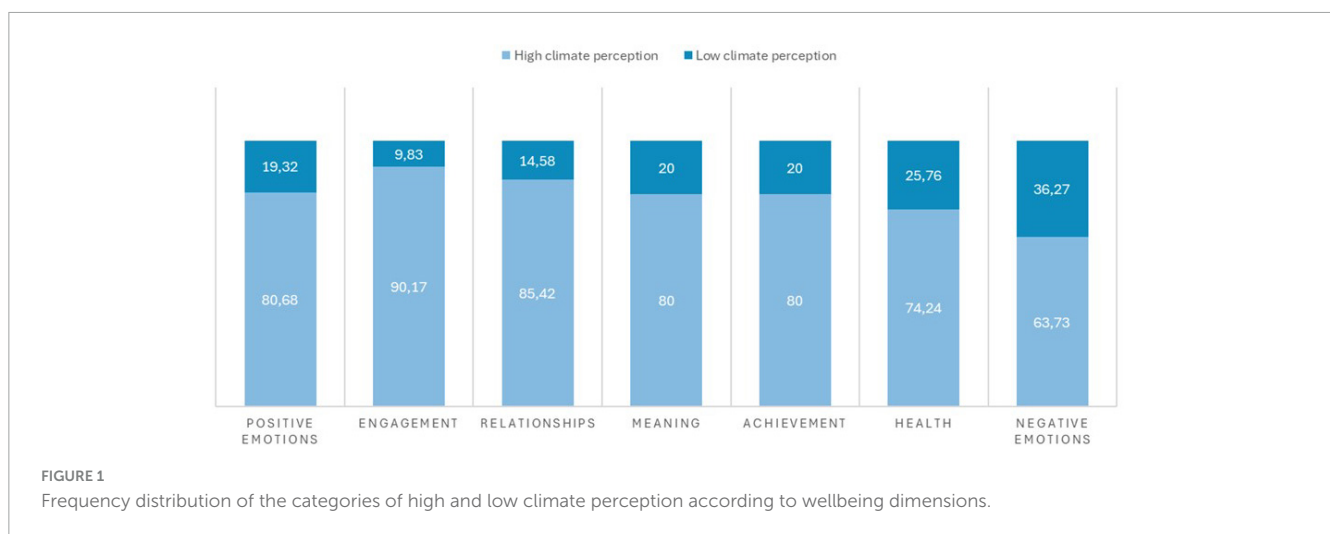
To estimate the effect of the perception of the learning climate on wellbeing dimensions, simple linear regression analyses were conducted for each wellbeing dimension (dependent variables). The results obtained are presented in Table 8, which reports the results of each regression model.

The regression model results showed that the perception of the learning climate explains 22% of the variance in positive emotions, with the model being statistically significant [ $F(1, 294) = 82.784, p < 0.001$ ]. For the prediction of the wellbeing dimension engagement, a statistically significant model was also identified [ $F(1, 294) = 76.670, p < 0.01$ ], explaining 20% of the variance. A similar result was identified in the prediction model for the positive relationships dimension, which was statistically significant [ $F(1, 294) = 62.237, p < 0.001$ ], explaining 17.5% of the variance. The identified prediction model for the purpose dimension was statistically significant [ $F(1, 294) = 101.332, p < 0.001$ ], explaining 25.7% of the variance. For the wellbeing dimension achievement, a statistically significant prediction model was identified [ $F(1, 294) = 93.082, p < 0.001$ ], explaining 24.1% of the variance. Finally, for multidimensional wellbeing, a statistically significant prediction model for the perception of the learning climate was identified [ $F(1, 294) = 119.482, p < 0.001$ ], explaining 29% of the variance (see Table 8).

TABLE 6 Descriptive statistics on wellbeing scores concerning groups with high and low perceptions of the learning climate.

Wellbeing dimensions	Perception of learning climate	N	M	SD	Std. error mean	t	df	Sig
Positive emotions	Low	114	4.403	1.378	0.129	6.094	204.850	0.000
	High	181	5.340	1.123	0.083			
Engagement	Low	114	4.722	1.201	0.112	5.566	173.712	0.000
	High	181	5.427	0.782	0.058			
Positive relationships	Low	114	4.900	1.431	0.134	4.556	194.985	0.000
	High	181	5.615	1.094	0.081			
Purpose	Low	114	4.374	1.51825	0.142	7.127	192.455	0.000
	High	181	5.554	1.14138	0.084			
Achievement	Low	114	4.348	1.36712	0.128	6.634	197.558	0.000
	High	181	5.346	1.06363	0.079			
Health	Low	114	4.149	1.64026	0.153	5.161	293	0.000
	High	181	5.057	1.35439	0.100			
Negative emotions	Low	114	4.380	1.17150	0.109	2.761	293	0.000
	High	181	3.981	1.22913	0.091			
Multidimensional wellbeing	Low	114	4.547	1.19407	0.111	7.005	189.257	0.000
	High	181	5.457	0.87783	0.065			

N, number of participants per group; M, mean; SD, standard deviation; Std. error mean, standard error of the mean; t, t-test value; df, degrees of freedom for the t-test.



## 4 Discussion

Wellbeing has been studied from various perspectives, notably hedonic and eudaimonic. The hedonic perspective focuses on subjective life satisfaction and positive emotional experiences (Diener and Ryan, 2009; Passeggia et al., 2023), while the eudaimonic perspective emphasizes personal growth, purpose, and self-realization (Ryan and Deci, 2006; Ryff, 1989). Seligman’s PERMA model (2011) combines both perspectives, describing wellbeing as a multidimensional construct that includes positive emotions, engagement, relationships, meaning, and accomplishment. This study aimed to evaluate the predictive

capacity of the perception of the learning climate on the multidimensional wellbeing of university students. After reviewing the results, it is possible to affirm that significant results were found.

Firstly, it was observed that students, in general, reported a medium-high level of wellbeing. The dimensions of positive relationships, engagement, and purpose were the ones that received the highest scores. These results are encouraging, as the literature suggests that this level of wellbeing may be indicative of high overall life satisfaction, as well as autonomy and resilience in students (Cabrera and Donaldson, 2023; Coffey et al., 2016; Leontopoulou, 2020). Specifically, a high level in the positive relationships dimension is associated with components such as

TABLE 7 Pearson correlation between learning climate and wellbeing.

Dimensions	1	2	3	4	5	6	7	8
Learning climate	1							
Positive emotions	0.469**	1						
Engagement	0.455**	0.691**	1					
Positive relationships	0.419**	0.660**	0.543**	1				
Purpose	0.507**	0.833**	0.683**	0.648**	1			
Achievement	0.491**	0.774**	0.667**	0.599**	0.842**	1		
Health	0.367**	0.614**	0.458**	0.559**	0.595**	0.582**	1	
Negative emotions	-0.194**	-0.243**	0.066	-0.123*	-0.176**	-0.104	-0.104	1
Multidimensional wellbeing	0.538**	0.914**	0.807**	0.796**	0.929**	0.897**	0.650**	-0.144*

\* $p < 0.05$ , \*\* $p < 0.01$ .

TABLE 8 Regression models of learning climate perception on wellbeing.

Dependent variable	Scale	Unstandardized coefficients	$\beta$	$t$	sig	$R$	$R^2$
	B						
Positive emotions	(Constant)	2.988	0.229	13.048	0.000	0.469	0.220
	Perception of autonomy support	0.447	0.049	0.469	9.099	0.000	
Engagement	(Constant)	3.644	0.181	20.175	0.000	0.455	0.207
	Perception of autonomy support	0.339	0.039	0.455	8.756	0.000	
Positive relationships	(Constant)	3.600	0.231	15.609	0.000	0.419	0.175
	Perception of autonomy support	0.390	0.049	0.419	7.889	0.000	
Purpose	(Constant)	2.766	0.242	11.409	0.000	0.507	0.257
	Perception of autonomy support	0.523	0.052	0.507	10.066	0.000	
Achievement	(Constant)	2.917	0.222	13.165	0.000	0.491	0.241
	Perception of autonomy support	0.458	0.047	0.491	9.648	0.000	
Multidimensional wellbeing	(Constant)	3.183	0.184	17.288	0.000	0.538	0.290
	Perception of autonomy support	0.431	0.039	0.538	10.931	0.000	

SE, standard error.

secure attachment and adaptation to university life, while it is negatively related to academic anxiety (Chaves et al., 2023; Cobo-Rendón et al., 2021; Umucu et al., 2024; Yang et al., 2024). In turn, a high level of engagement is related to a high level of perceived autonomy among students (Luruli et al., 2020), while a high level of purpose is associated with academic experiences that involve participation in community or cultural activities (Kovich et al., 2023).

For the dimensions of positive emotions, perception of accomplishment, and perception of health, were located at a medium level on the response scale. In this case, it is important to highlight that positive emotions are a fundamental variable for the wellbeing of young people, having positive effects on the rest of the dimensions (Ye et al., 2024), so the presence of medium or high scores is of interest to evaluate in the educational context.

Regarding the medium level of the perception of accomplishment dimension, this was identified at a medium level on the scale, making it relevant to evaluate this score in this scenario. This is because some students might not experience their training as attractive or challenging, which could hinder academic success and increase wellbeing (Kovich et al., 2023).

#### 4.1 Learning climate and student wellbeing according to academic year and gender

In the statistical analyses conducted, no significant differences were identified in the perception of the learning climate and

wellbeing according to academic year or gender (H1 and H2). In the case of the learning climate, these findings are consistent with other research on university students where no differences were found between men and women. It appears that the perception of the learning climate is not differentiated according to the gender of the students (Navarro Huaranga et al., 2022). The results obtained are consistent with the central finding presented by Mammadov and Schroeder (2023), who observed in their systematic review that the samples analyzed showed a higher percentage of women compared to men, with 52.7% female representation and approximately 68% of the samples being predominantly women. These authors explain that, although some studies did not find significant differences in learning outcomes based on gender, others suggest that women may benefit more from affective relationships with teachers and support for their autonomy. This suggests that the social and emotional context may influence how students, especially women, respond to educational support.

However, the results regarding academic year contradict other studies, where differences were found in the perception of the learning climate between first and second-year students (Yüce, 2023). Thus, the perception of teacher support for student autonomy varies according to the different academic demands present at various levels of education.

Regarding wellbeing, studies on student samples report the existence of positive and significant differences in favor of women in positive emotions and relationships and a significant difference in favor of men in meaning and achievements (Hejazi et al., 2021). In terms of aspects of psychological wellbeing, gender differences have also been identified; men tend to report higher levels of autonomy than women, while women report higher levels of personal growth in terms of wellbeing (Barra Almagia, 2012). Despite not identifying differences, empirical evidence highlights the importance of understanding the specific needs and strengths of each gender, which can contribute to creating more inclusive and effective environments for the personal and academic development of all students.

## 4.2 Interaction between learning climate levels and sex on wellbeing and its dimensions

The analysis of the interaction between learning climate levels and sex revealed that, in terms of engagement, men in a high climate showed higher levels than women, while in low climates, women outperformed men. This finding suggests that the learning climate significantly influences student engagement, varying by sex.

To interpret the results on engagement in relation to learning climate and sex, it is essential to consider the research by Mammadov and Schroeder (2023), which highlights the importance of the learning climate in students' motivation and engagement. This study suggests that a positive educational environment can foster greater involvement in academic activities. The finding that men in high climates exhibit higher levels of engagement can be explained by the notion that positive climates, characterized by strong emotional support and effective interpersonal relationships, may align better with male learning expectations and styles. The literature suggests that men may

respond favorably to contexts that promote competence and recognition, which could explain their higher engagement in positive climates. These results are consistent with the conclusions of Nishimura and Joshi (2021), who indicate that autonomy support provided by authority figures significantly impacts the satisfaction of basic psychological needs, which in turn influences students' academic performance and emotional wellbeing. This context is key to understanding why men in high climates showed superior levels of engagement; an environment that promotes autonomy may resonate more with their educational expectations.

Additionally, it has been documented that the desired degree of autonomy may differ between boys and girls, affecting their ability to demonstrate self-directed learning (Mammadov and Schroeder, 2023). Likewise, Mammadov and Schroeder (2023) suggest that women may experience variations in their motivation and engagement depending on the type of support received, implying that a more personalized approach could be essential to maximizing their involvement in educational contexts. The observation that women outperform men in low climates indicates that they may respond more favorably to environments where more emotional or individualized support is provided, which is consistent with literature suggesting that women value interpersonal relationships more in their educational experience. Finally, Mammadov and Schroeder (2023) emphasize that gender differences in engagement may be influenced by contextual factors, suggesting that to optimize the engagement of all students, it is essential to create an inclusive learning climate that adapts to the specific needs of each group. This reinforces the need to implement educational strategies that consider these differences to foster greater engagement and wellbeing among all students.

## 4.3 Differences in wellbeing among students with high and low perception of learning climate

Significant differences in wellbeing were observed between those with high and low perceptions of the learning climate. Students with a high perception of the learning climate showed higher levels of positive emotions, engagement, positive relationships, and achievement, as well as better health perception compared to those with a low perception.

This relationship may be because interpersonal contexts, including the educational context, play an important role in satisfying basic psychological needs, promoting autonomy, and perceived competence, and the establishing of meaningful social relationships among students (Deci and Ryan, 2000, 2002). Therefore, a high perception of the climate indicates that students perceive the educational interpersonal climate as satisfying their basic psychological needs. Conversely, a low perception of the learning climate may indicate that students do not perceive the educational context as facilitating autonomy, which in turn hinders overall and academic satisfaction (Huéscar Hernández et al., 2022; Vergara-Morales et al., 2019).

This is relevant in the educational context, as wellbeing is a key construct for successful learning (Mayerhofer et al., 2023; Pineda-Espejel et al., 2023). Indeed, research has shown that when there is a high learning climate, students tend to be more engaged

with their academic activities, have greater interest in learning and developing new skills, and show higher academic engagement (Navarro Huaranga et al., 2022).

#### 4.4 Predicting the perception of learning climate on university students' wellbeing

It was found that the perception of the learning climate was significantly associated with all the wellbeing dimensions studied, with the strongest association being with the purpose dimension. In the PERMA model, purpose is considered the belief that one's life is valuable and a sense of connection to something larger than oneself (Kern et al., 2015).

According to these results, the type of climate fostered in the classroom predicts the student's perception of the meaning of their life in this aspect. Similarly, these results align with previous evidence where the learning climate reflects a wide variety of activities developed within the school experience, through which teachers can create, acquire, and transfer knowledge and engage in learning behaviors with students (Shoshani and Eldor, 2016). Methodologies such as tutoring, the availability of elective subjects, and small group work favor autonomy in university students, which in turn is positively associated with wellbeing (Mayerhofer et al., 2023).

Linear regression analyses revealed that the perception of the learning climate explained a significant portion of the variance in all the wellbeing dimensions studied, with percentages ranging from 20 to 29%, depending on the specific wellbeing dimension. These findings suggest that the perception of the learning climate plays an important role in the wellbeing of university students and that a more positive perception of the learning climate is associated with greater wellbeing across multiple dimensions. This highlights the importance of promoting a positive and supportive learning environment to improve the overall wellbeing of university students. When academic terms focus on the individual, students perceive themselves as the center of their learning, fostering intrinsic motivations to make decisions about their education. This maximizes their autonomy and has a positive impact on their wellbeing and social empowerment (Tymms and Peters, 2020).

These observations underscore the relevance of students' learning experiences and how these can influence their engagement and perception of achievements, demonstrating the importance of the environment in shaping learning experiences by teachers (Sakız, 2017). Therefore, these findings suggest that a positive and supportive learning environment is crucial for student wellbeing. Promoting a learning climate that satisfies the needs for autonomy, competence, and relationships can significantly enhance wellbeing. Educational institutions should consider strategies to improve the learning climate, which could include training for teachers in autonomy-supportive practices and fostering positive interpersonal relationships within the educational environment.

Teacher support practices correlate positively with desired outcomes for students, including wellbeing and, consequently, performance (Howard et al., 2024). Autonomy-supportive teaching involves taking students' perspectives, encouraging the use of participatory practices that offer choices to develop learning at their own pace, and incorporating students' interests, perspectives,

and feelings during the development of their learning experiences (Collie et al., 2024). These practices should also be explicit, as students who perceive teachers' expectations and motivation are more likely to be motivated and develop an interest in learning (Escalante Mateos et al., 2021).

Thus, the reported findings contribute to the development of research on wellbeing in the educational context. Among the strengths of this study is the use of the PERMA model for measuring wellbeing, as this theoretical approach offers a comprehensive and multidimensional view of wellbeing, allowing a perspective on the eudaimonic and hedonic elements of this construct in university students. Therefore, the findings of this research indicate that the perception of a learning climate that prioritizes autonomy contributes to the multidimensional wellbeing of university students, covering various dimensions such as positive emotions, engagement, relationships, purpose, and achievements. This result aligns with Self-Determination Theory and supports previous studies that emphasize how autonomy support fosters the emergence of positive emotions in students, which is related to a greater perception of competence and intrinsic value toward learning activities (Berweger et al., 2021; Meng-Ting Lo, 2021).

In terms of engagement, it is evident that this aspect of wellbeing is predicted by a high perception of autonomy support. By meeting their psychological needs, students display greater academic engagement and higher satisfaction with their university experience. This connection has also been linked to improved learning outcomes (Jiang and Tanaka, 2022; Mammadov and Schroeder, 2023; Matos et al., 2018).

Regarding interpersonal relationships, the results suggest that autonomy support is closely tied to enhanced interactions among students. This type of environment allows students to feel valued and recognized, which strengthens their support networks and sense of belonging (Wu and Xindong, 2024). Autonomy support is also associated with a greater sense of purpose in students. Those who find meaning in their studies, such as counseling students, tend to exhibit higher wellbeing and a greater perception of competence (Hurst and Prescott, 2021). An environment that promotes autonomy fosters meaningful and vocational learning, motivating students to establish deeper connections between their academic goals and personal lives.

Finally, academic achievements are also predicted by autonomy support. A meta-analysis conducted by Okada (2021) revealed that perceived autonomy support has a positive effect on academic performance and a moderate to large impact on students' autonomous motivation. Therefore, an environment that encourages self-direction allows students to manage their own learning more effectively, which translates into better academic outcomes. These findings underscore the importance of an autonomy-centered learning climate in promoting the overall wellbeing of university students.

Similarly, evaluating the perception of the learning climate in relation to these dimensions provides greater clarity on which aspects of wellbeing are impacted by the development of educational interpersonal contexts. It is also crucial to consider the cultural characteristics present in university teaching, as cultural norms and values can significantly influence how students perceive autonomy, engagement, and their overall wellbeing. Understanding these cultural factors is essential for creating learning environments



that are not only supportive but also culturally responsive, thereby enhancing the effectiveness of educational practices in diverse university settings.

Among the limitations of this study, the results were obtained through self-report questionnaires, which may introduce response biases. Additionally, there was a gender bias in the sample, with a larger proportion of female participants (75%). This gender imbalance could have influenced some of the findings, particularly in dimensions such as engagement and positive emotions, where women generally reported higher scores in certain conditions. Future research should aim to include a more balanced gender representation to better understand potential gender differences in the perception of the learning climate and wellbeing outcomes.

Another important limitation is the high correlation observed between the dimensions of wellbeing, which may have masked individual predictions in the regression analyses. This high interrelatedness among wellbeing dimensions suggests that the use of more advanced analytical techniques, such as Structural Equation Modeling (SEM) or multiple regression analyses with all dimensions included as predictors, could provide a more detailed understanding of how each dimension uniquely contributes to the overall prediction of wellbeing. Finally, the study was conducted with students from a specific field of study at a single university in Chile, limiting the generalizability of the results to other educational contexts or disciplines.

Therefore, future research should extend the investigation to other regions and cultures to evaluate the generalizability of the findings, as well as examine whether there are significant differences in the perception of the learning climate and wellbeing among different subgroups of students (e.g., by faculties, levels of study, socioeconomic context). Additionally, understanding the mechanisms through which the learning climate influences wellbeing can help design more precise interventions, and how variables such as self-efficacy, intrinsic motivation, and social support may play crucial roles in success at this stage. From the teachers' perspective, it is suggested that future research focus on exploring the factors that favor teachers providing support and creating a motivating learning climate.

## 5 Conclusion

The results revealed that, although students generally reported a medium-high level of wellbeing, those with a more positive perception of the learning climate experienced significantly higher levels of wellbeing in various dimensions, such as positive emotions, engagement, positive relationships, and achievements. While it was not possible to identify differences in the perception of the learning climate and wellbeing among student groups based on academic year and gender, it was evident that the perception of the learning climate was significantly associated with all dimensions of wellbeing, with the strongest association being with the purpose dimension. Linear regression analyses confirmed that the perception of the learning climate explains a significant portion of the variance in all the wellbeing dimensions studied, with percentages ranging from 20 to 29%. Future research should delve into the factors that foster motivating learning climates and teaching practices that support the wellbeing of university students.

## Data availability statement

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

## Ethics statement

The studies involving humans were approved by the Comité de ética, Universidad del desarrollo. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

## Author contributions

RC-R: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Writing – original draft, Writing – review and editing. DG-Á: Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review and editing. RR: Data curation, Formal analysis, Software, Validation, Visualization, Writing – original draft, Writing – review and editing. JS: Conceptualization, Investigation, Writing – original draft, Writing – review and editing.

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## Conflict of interest

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

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## References

- Appleseth, H. S., LaCaille, L. J., LaCaille, R. A., Hessler, E. E., and Liang, J. O. (2023). Changes in basic psychological needs, passion, and well-being of first-semester graduate students. *J. Am. Coll. Health*. doi: 10.1080/07448481.2023.2186128 [Epub ahead of print].
- Ato, M., López-García, J. J., and Benavente, A. (2013). Un sistema de clasificación de los diseños de investigación en psicología. *An. Psicol.* 29, 1038–1059. doi: 10.6018/analesps.29.3.178511
- Auyeung, L., and Han Mo, P. K. (2019). The efficacy and mechanism of online positive psychological intervention (PPI) on improving well-being among Chinese university students: A pilot study of the best possible self (BPS) intervention. *J. Happiness Stud.* 20, 2525–2550. doi: 10.1007/s10902-018-0054-4
- Barra Almagia, E. (2012). Influencia de la autoestima y del apoyo social percibido sobre el bienestar psicológico de estudiantes universitarios chilenos. *Diversitas Perspect. Psicol.* 8, 29–38.
- Bernardo, A. B., Galve-González, C., Núñez, J. C., and Almeida, L. S. (2022). A path model of university dropout predictors: The role of satisfaction, the use of self-regulation learning strategies and students' engagement. *Sustainability* 14:3. doi: 10.3390/su14031057
- Berweger, B., Krammer, G., and Keller, U. (2021). The intraindividual dynamics of university students' motivation and emotions: The role of autonomy-supportive learning climates and learning activities. *Learn. Individ. Differ.* 88:102103. doi: 10.1016/j.lindif.2021.102103
- Burns, R. A. (2017). "Psychosocial well-being," in *Encyclopedia of geropsychology*, ed. N. A. Pachana (Singapore: Springer), 1977–1984.
- Cabrera, V., and Donaldson, S. I. (2023). PERMA to PERMA+4 building blocks of well-being: A systematic review of the empirical literature. *J. Posit. Psychol.* 19, 510–529. doi: 10.1080/17439760.2023.2208099
- Chaves, C., Ballesteros-Valdés, R., Madridejos, E., and Charles-Leija, H. (2023). PERMA-Profilier for the evaluation of well-being: Adaptation and validation in a sample of university students and employees in the Mexican educational context. *Appl. Res. Qual. Life* 18, 1225–1247. doi: 10.1007/s11482-022-10132-1
- Chen, C., Fan, J., and Jury, M. (2017). Are perceived learning environments related to subjective well-being? A visit to university students. *Learn. Individ. Differ.* 54, 226–233. doi: 10.1016/j.lindif.2017.01.001
- Cho, H. J., Levesque-Bristol, C., and Yough, M. (2023). How autonomy-supportive learning environments promote Asian international students' academic adjustment: A self-determination theory perspective. *Learn. Environ. Res.* 26, 51–76. doi: 10.1007/s10984-021-09401-x
- Cobo-Rendón, R. C., Parra, J. A. A., and García-Álvarez, D. D. J. (2021). Análisis psicométrico del perfil de bienestar "Perma-Profilier" en una muestra estudiantes de Psicología. *Anu. Psicol.* 51, 35–43. doi: 10.1344/ANPSIC2021.51/1.28677
- Cobo-Rendón, R., Pérez-Villalobos, M. V., and Díaz-Mujica, A. (2020). Propiedades psicométricas del PERMA-Profilier para la medición del bienestar en una muestra de estudiantes universitarios chilenos. *Rev. Ciencias Salud.* 18, 119–133. doi: 10.12804/revistas.urosario.edu.co/revsalud/a.8775
- Coffey, J. K., Wray-Lake, L., Mashek, D., and Branand, B. (2016). A multi-study examination of well-being theory in college and community samples. *J. Happiness Stud.* 17, 187–211. doi: 10.1007/s10902-014-9590-8
- Cohen, J. (1988). "The effect size index," in *Statistical power analysis for the behavioral sciences*, ed. J. Cohen (New York, NY: Routledge), 25–26.
- Collie, R. J., Martin, A. J., Renshaw, L., and Caldecott-Davis, K. (2024). Students' perceived social-emotional competence: The role of autonomy-support and links with well-being, social-emotional skills, and behaviors. *Learn Instr.* 90:101866. doi: 10.1016/j.learninstruc.2023.101866
- Deci, E. L., and Ryan, R. M. (2000). The "What" and the "Why" of goal pursuits: Human needs and the self-determination of behaviour. *Psychol. Inq.* 11, 227–268. doi: 10.3389/fpsyg.2024.1337064
- Deci, E. L., and Ryan, R. M. (2002). *Handbook of self-determination research*. New York, NY: University of Rochester Press.
- Deci, E. L., Schwartz, A. J., Sheinman, L., and Ryan, R. M. (1981). An instrument to assess adults' orientations toward control versus autonomy with children: Reflections on intrinsic motivation and perceived competence. *J. Educ. Psychol.* 73, 642–650.
- Diener, E., and Ryan, R. M. (2009). Subjective well-being: A general overview. *South Afr. J. Psychol.* 39, 391–406. doi: 10.1177/008124630903900402
- Englund, H., Stockhult, H., Du Rietz, S., Nilsson, A., and Wennblom, G. (2023). Learning-environment uncertainty and students' approaches to learning: A self-determination theory perspective. *Scand. J. Educ. Res.* 67, 559–573. doi: 10.1080/00313831.2022.2042734
- Escalante Mateos, N., Fernández-Zabala, A., Goñi Palacios, E., and Izar-de-la-Fuente Díaz-de-Cerio, I. (2021). School climate and perceived academic performance: Direct or resilience-mediated relationship? *Sustainability* 13:1. doi: 10.3390/su13010068
- Grolnick, W. S. (2003). *The psychology of parental control: How well-meant parenting backfires*. New Jersey: Erlbaum.
- Gutiérrez, M., and Tomás, J. M. (2019). The role of perceived autonomy support in predicting university students' academic success mediated by academic self-efficacy and school engagement. *Educ. Psychol.* 39, 729–748. doi: 10.1080/01443410.2019.1566519
- Hadwin, A. F., Jarvela, S., and Miller, M. (2018). "Self-regulated, co-regulated, and socially-shared regulation in collaborative learning environments," in *Handbook of self-regulation, learning, and performance*, eds D. H. Schunk and J. A. Greene (London: Routledge), 83–106.
- Hejazi, E., Abbasi, F., Hakimzadeh, R., and Ejei, J. (2021). Flourishing profile of gifted students based on Seligman's PERMA model: A study of gender differences. *J. New Thoughts Educ.* 17, 221–240. doi: 10.22051/jontoe.2021.32307.3095
- Hernández Sampieri, R., Fernández Collado, C., and del Baptista Lucio, M. P. (2014). *Metodología de la investigación*, 6th Edn. México: McGraw-Hill/Interamericana Editores.
- Holzer, J., Lüftenegger, M., Korlat, S., Pelikan, E., Salmela-Aro, K., Spiel, C., et al. (2021). Higher education in times of COVID-19: University students' basic need satisfaction, self-regulated learning, and well-being. *AERA Öpen* 7:1. doi: 10.1177/23328584211003164
- Hoque, M., Uzzaman, A., and Zungu, L. (2023). Basic psychological needs assessment of university students in Bangladesh: A quantitative cross-sectional study. *Africa J. Nurs. Midwifery* 25:2. doi: 10.25159/2520-5293/14142
- Howard, J. L., Bureau, J. S., Guay, F., Chong, J. X. Y., and Ryan, R. M. (2021). Student motivation and associated outcomes: A meta-analysis from self-determination theory. *Perspect. Psychol. Sci.* 16, 1300–1323. doi: 10.1177/1745691620966789
- Howard, J. L., Slemp, G. R., and Wang, X. (2024). Need support and need thwarting: A meta-analysis of autonomy, competence, and relatedness supportive and thwarting behaviors in student populations. *Pers. Soc. Psychol. Bull.* doi: 10.1177/01461672231225364 [Epub ahead of print].
- Hués-car Hernández, E., Lozano-Jiménez, J. E., de Roba Noguera, J. M., and Moreno-Murcia, J. A. (2022). Relationships among instructor autonomy support, and university students' learning approaches, perceived professional competence, and life satisfaction. *PLoS One* 17:e0266039. doi: 10.1371/journal.pone.0266039
- Hurst, R., and Prescott, J. (2021). Meaning in life and perceived self-competence in counselling students. *Couns. Psychother. Res.* 21, 346–354. doi: 10.1002/capr.12406
- Jeno, L. M., Nylehn, J., Hole, T. N., Raaheim, A., Velle, G., and Vandvik, V. (2023). Motivational determinants of students' academic functioning: The role of autonomy-support, autonomous motivation, and perceived competence. *Scand. J. Educ. Res.* 67, 194–211. doi: 10.1080/00313831.2021.1990125
- Jiang, J., and Tanaka, A. (2022). Autonomy support from support staff in higher education and students' academic engagement and psychological well-being. *Educ. Psychol.* 42, 42–63. doi: 10.1080/01443410.2021.1982866
- Kern, M. L., Waters, L. E., Adler, A., and White, M. A. (2015). A multidimensional approach to measuring well-being in students: Application of the PERMA framework. *J. Positive Psychol.* 10, 262–271. doi: 10.1080/17439760.2014.936962
- Kovich, M. K., Simpson, V. L., Foli, K. J., Hass, Z., and Phillips, R. G. (2023). Application of the PERMA model of well-being in undergraduate students. *Int. J. Commun. Well Being* 6:1. doi: 10.1007/s42413-022-00184-4
- Leontopoulou, S. (2020). Measuring well-being in emerging adults: Exploring the PERMA framework for positive youth development. *Psychology* 25, 72–93. doi: 10.12681/psy\_hps.25337
- Leow, S., Leow, K., and Ean, C. (2023). Satisfaction of basic psychological needs and eudaimonic well-being among first-year university students. *Cogen. Soc. Sci.* 9, 2275441. doi: 10.1080/23311886.2023.2275441
- Luruli, K., Mostert, K., and Jacobs, M. (2020). Testing a structural model for study demands and resources, study engagement and well-being of first-year university students. *J. Psychol. Afr.* 30, 179–186. doi: 10.1080/14330237.2020.1767925
- Mammadov, S., and Schroeder, K. (2023). A meta-analytic review of the relationships between autonomy support and positive learning outcomes. *Contemp. Educ. Psychol.* 75:102235.
- Marôco, J., Assunção, H., Harju-Luukkainen, H., Lin, S.-W., Sit, P.-S., Cheung, K.-c, et al. (2020). Predictors of academic efficacy and dropout intention in university students: Can engagement suppress burnout? *PLoS One* 15:e0239816. doi: 10.1371/journal.pone.0239816
- Matos Fernández, L. (2009). Adaptación de dos cuestionarios de motivación: Autorregulación del Aprendizaje y Clima de Aprendizaje. *Persona* 12, 167–185. doi: 10.26439/persona2009.n012.282
- Matos, L., Reeve, J., Herrera, D., and Claux, M. (2018). Students' agentic engagement predicts longitudinal increases in perceived autonomy-supportive teaching: The squeaky wheel gets the grease. *J. Exp. Educ.* 86, 579–596. doi: 10.1080/00220973.2018.1448746

- Mayerhofer, M., Lüftenegger, M., and Eichmair, M. (2023). Impact of a mathematics bridging course on the motivation and learning skills of university students. *Int. J. Res. Undergrad. Math. Ed.* doi: 10.1007/s40753-023-00224-0
- Meng-Ting Lo, M. T. (2021). Motivational beliefs and emotions in higher education learning environments. *J. Learn. Sci.* 12, 50–67.
- Nalipay, M. J. N., King, R. B., and Cai, Y. (2020). Autonomy is equally important across East and West: Testing the cross-cultural universality of self-determination theory. *J. Adolesc.* 78, 67–72. doi: 10.1016/j.adolescence.2019.12.009
- Navarro Huaranga, A. H., Díaz Chirino, V. R., Arauco Mendoza, N. B., and Terrones, D. C. (2022). Clima de aprendizaje y compromiso académico en estudiantes universitarios de Lima metropolitana. *Invest. Postgrado* 37, 189–216.
- Neufeld, A., and Malin, G. (2020). How medical students' perceptions of instructor autonomy-support mediate their motivation and psychological well-being. *Med. Teach.* 42, 650–656. doi: 10.1080/0142159X.2020.1726308
- Nishimura, M., and Joshi, A. (2021). Self-determination theory and the happiness and academic achievement of students at a women's university. *Psychol. Stud.* 66, 139–153. doi: 10.1007/s12646-021-00617-8
- Okada, R. (2021). Teachers' autonomy support in synchronous online learning environments. *Inform. Technol. Educ. Learn.* 1:1. doi: 10.12937/itel.1.1.Reg.p004
- Okada, R. (2023). Effects of perceived autonomy support on academic achievement and motivation among higher education students: A meta-analysis. *Jpn. Psychol. Res.* 65, 230–242. doi: 10.1111/jpr.12380
- Passeggia, R., Testa, I., Esposito, G., De Luca Picione, R., Ragozini, G., and Freda, M. F. (2023). Examining the relation between first-year university students' intention to drop-out and academic engagement: The role of motivation, subjective well-being and retrospective judgements of school experience. *Innov. High. Educ.* 48, 837–859. doi: 10.1007/s10755-023-09674-5
- Pineda-Espejel, H. A., Morquecho-Sánchez, R., Terán, L., López-Gaspar, I., Hernández-Mendo, A., Morales-Sánchez, V., et al. (2023). Satisfied and frustrated needs, subjective vitality and university students' life satisfaction of physical activity and sports. *Sustainability* 15:4. doi: 10.3390/su15043053
- Ratelle, C. F., Simard, K., and Guay, F. (2013). University students' subjective well-being: The role of autonomy support from parents, friends, and the romantic partner. *J. Happiness. Stud.* 14, 893–910. doi: 10.1007/s10902-012-9360-4
- Reeve, J. (2009). Why teachers adopt a controlling motivating style toward students and how they can become more autonomy supportive. *Educ. Psychol.* 44, 159–175.
- Reeve, J. (2016). "Autonomy-supportive teaching: What it is, how to do it," in *Building autonomous learners: Perspectives from research and practice using self-determination theory*, eds W. Liu, J. Wang, and R. Ryan (Singapore: Springer Singapore), 129–152.
- Ryan, R. M., and Deci, E. L. (2006). Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination, and will? *J. Pers.* 74, 1557–1586. doi: 10.1111/j.1467-6494.2006.00420.x
- Ryan, R. M., and Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York, NY: The Guilford Press.
- Ryan, R. M., Reeve, J., Kaplan, H., Matos, L., and Cheon, S. H. (2023). "Education as flourishing: Self-determination theory in schools as they are and as they might be," in *The Oxford handbook of self-determination theory*, ed. R. M. Ryan (Oxford: Oxford University Press), 591–618.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Pers. Soc. Psychol.* 57, 1069–1081. doi: 10.1037/0022-3514.57.6.1069
- Ryff, C. D., and Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *J. Pers. Soc. Psychol.* 69, 719–727. doi: 10.1037/0022-3514.69.4.719
- Sakız, H. (2017). Impact of an inclusive programme on achievement, attendance and perceptions towards the school climate and social-emotional adaptation among students with disabilities. *Educ. Psychol.* 37, 611–631. doi: 10.1080/01443410.2016.1225001
- Seligman, M. (2018). PERMA and the building blocks of well-being. *J. Posit. Psychol.* 13, 333–335. doi: 10.1080/17439760.2018.1437466
- Shoshani, A., and Eldor, L. (2016). The informal learning of teachers: Learning climate, job satisfaction and teachers' and students' motivation and well-being. *Int. J. Educ. Res.* 79, 52–63. doi: 10.1016/j.ijer.2016.06.007
- Soenens, B., and Vansteenkiste, M. (2010). A theoretical upgrade of the concept of parental psychological control: Proposing new insights on the basis of self-determination theory. *Dev. Rev.* 30, 74–99. doi: 10.1016/j.dr.2009.11.001
- Su, Y. L., and Reeve, J. (2011). A meta-analysis of the effectiveness of intervention programs designed to support autonomy. *Educ. Psychol. Rev.* 23, 159–188. doi: 10.1007/s10648-010-9142-7
- Sulla, F., Monacis, D., and Limone, P. (2023). A systematic review of the role of teachers' support in promoting socially shared regulatory strategies for learning. *Front. Psychol.* 14:1208012. doi: 10.3389/fpsyg.2023.1208012
- Tymms, M., and Peters, J. (2020). Losing oneself: Tutorial innovations as potential drivers of extrinsic motivation and poor wellbeing in university students. *Pastor. Care Educ.* 38, 42–63. doi: 10.1080/02643944.2020.1713871
- Umucu, E., Chan, F., Phillips, B., Tansey, T., Berven, N., and Hoyt, W. (2024). Evaluating optimism, hope, resilience, coping flexibility, secure attachment, and perma as a well-being model for college life adjustment of student veterans: A hierarchical regression analysis. *Rehabil. Couns. Bull.* 67, 94–110. doi: 10.1177/00343552221127032
- Vergara-Morales, J., Del Valle, M., Díaz, A., Matos, L., and Pérez, M. V. (2019). Perfiles motivacionales relacionados con la satisfacción académica de estudiantes universitarios. *An. Psicol.* 35, 464–471. doi: 10.6018/analesps.35.3.320441
- Williams, G. C., and Deci, E. L. (1996). Internalization of biopsychosocial values by medical students: A test of self-determination theory. *J. Pers. Soc. Psychol.* 70, 767–779. doi: 10.1037/0022-3514.70.4.767
- Wu, X., and Xindong, Y. (2024). Positive student-teacher relationships and the role of autonomy support in educational well-being. *J. Educ. Res.* 48, 90–110.
- Yang, J., Tan, Y., and Yao, C. (2024). Can a PERMA model-based positive psychological intervention affect the SIA and SWB of vocational college students majoring in nursing in China? *Front. Psychol.* 15:1337064. doi: 10.3389/fpsyg.2024.1337064
- Ye, J.-H., Wu, Y.-T., Wu, Y.-F., Chen, M.-Y., Nong, W., and Lee, Y.-S. (2024). A study on the construction and validation of pathways to the sustainable well-being of Chinese vocational students in the post-epidemic era. *Curr. Psychol.* 43, 7511–7525. doi: 10.1007/s12144-023-04954-x
- Yüce, E. (2023). Critical thinking, autonomous learning, and academic grit among preservice EFL teachers. *Think. Skills Creat.* 50:101382. doi: 10.1016/j.tsc.2023.101382