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Study of emotional intelligence and leadership competencies in university students

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ABSTRACT

This article examines the relationship between emotional intelligence and ethical leadership competencies among university students. The research hypothesis was that emotional intelligence correlates positively with the exercise of good leadership. To this aim, a study was carried out with 1101 university students from Chile, Mexico and Spain who responded to a questionnaire on emotional intelligence (WLEIS) and a questionnaire on leadership competencies (LID) that measures understanding of reality, self-control and team harmonisation. The results show a positive correlation between emotional intelligence and leadership, although with significant differences by country and degree programs, but not in relation to gender. The research contribution is particularly relevant. Firstly, there are few studies on emotional intelligence and ethical leadership competencies carried out in the university student environment. Secondly, the study provides evidence of the predictive validity of emotional intelligence, in particular 'use of emotions', on leadership competencies. This finding points to the importance of teaching emotional intelligence in order to develop the leadership competencies of university students.

KEY POINTS

what is already known about this topic

1. Correlation between emotional intelligence and leadership, although with questions and doubts.
2. Good leadership requires training in personal competencies related to emotional intelligence and emotional management.
3. Research on emotional intelligence and leadership in university students is insufficient.

what this topic adds:

1. Evidence on which components of emotional intelligence and which leadership competencies are interrelated.
2. International comparative evidence from three countries where there is little previous research: Spain, Mexico and Chile.
3. A finding on the predictive value of emotional intelligence, in particular 'use of emotions' for leadership in university students.

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Introduction

There has been increasing scientific interest in emotional intelligence (EI) in recent years, primarily oriented towards leadership competencies (LC). In the late 1990s, Goleman (1998) proposed that the most effective leaders are those with emotional competencies, such as self-awareness, emotional self-management and empathy. George (2000) proposed that understanding and managing emotions contributes to

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effective leadership. Since then, many authors have underscored the close and positive relation between emotional intelligence and leadership (Caruso et al., 2002; Pitsi et al., 2023; Rosete & Ciarrochi, 2005; Walter et al., 2011; Wong & Law, 2002) although this notion is not without its critics. In summary, criticisms point to 1) the lack of clarity and agreement on the concept and models of emotional intelligence and its operationalisation; 2) the need for better assessment and measurement of emotional intelligence and its predictive value for organisational outcomes such as leadership behaviors (Antonakis et al., 2009; McCleskey, 2014).

In the field of university education, interest in emotional intelligence has been growing, considered as a teachable competence, as with leadership competencies. The Tuning project, initially linked to the European Higher Education Area, has promoted education in competencies, even in Latin America (González et al., 2004), including leadership and interpersonal competencies, enabling students to express their feelings and facilitate social interaction. The Tuning project, launched in 2000, aims to improve the quality of higher education, harmonise curricula based on a common competence framework, and promote student and professional mobility. Although there are some studies and meta-analysis that investigate emotional intelligence and leadership (Alshammari et al., 2020; Hsu et al., 2022; Miao et al., 2017; 2021; Mills, 2009), the research is insufficient and the debate about the validity and measurement of emotional intelligence has not been resolved (Dashborough et al., 2022), particularly in Spanish-speaking universities and in cross-cultural contexts. The relationship between emotional intelligence and leadership needs to continue to be explored with methodological rigour and new perspectives (Shao, 2024). There are gaps in the literature that indicate the need to interpret the relationship between dimensions of emotional intelligence and leadership. This requires a review of the concepts and models underlying each construct.

Other limitations observed in relation to studies on the impact of emotional intelligence in higher education include insufficient connection between quantitative and qualitative methodologies, the lack of a model linking student education and teacher training in emotional intelligence, and the integration of emotional competencies in higher education curriculum (Soliman et al., 2023).

This article presents the results of research carried out with 1101 students of various university degree programs in Chile, Mexico and Spain, studying the relationship between emotional intelligence and good leadership. The aim is to contribute to a greater understanding of a phenomenon that has not received sufficient attention. The study used the WLEIS questionnaire on emotional intelligence, validated for the Spanish population (Extremera Pacheco et al., 2019) and the LID questionnaire on education in leadership of Spanish-speaking students (López González et al., 2023), currently in the process of validation.

We will begin with the theoretical foundations of emotional intelligence and its association with good leadership, followed by a description of the objectives of the research, the materials and methodology used (quantitative), and the empirical results, with a discussion on the findings oriented towards future research, and certain conclusions.

Theoretical foundation

Concept of emotional intelligence

Emotional intelligence can be conceptualised in different ways, depending on whether it is considered as a trait, an acquired skill, or a combination of both (McCleskey, 2014).

Model of emotional intelligence as a trait

The model proposed by Petrides and Furnham (2003) conceives EI as a trait; that is, as a pattern of persistent behaviour (as opposed to competence or skill which can be modified more easily through practice) associated with the tendencies, personality traits and beliefs of an individual. This model consists of fifteen dimensions grouped into four factors: well-being, self-control, emotionality, and sociability.

Models of emotional intelligence as a skill

Based on the definition of Salovey and Mayer (1990), Goleman (1995) proposed that emotional intelligence consists of five key competencies: emotional self-awareness, emotional self-regulation, self-motivation, empathy, and social competence. According to this model, these competencies can be learned and developed throughout one's life and contribute to professional success.

Salovey and Mayer (1990); Mayer & Salovey, 1997; Mayer et al., 1999) developed a model based on the notion that emotional intelligence is a set of competencies that involve the ability to perceive, understand and regulate one's own and others' emotions. These competencies are grouped into four areas: emotional perception, emotional facilitation, emotional understanding, and emotional regulation.

Mixed models of emotional intelligence

Although Petrides begins with the concept of emotional intelligence as a trait (Petrides & Furnham, 2003), he has subsequently proposed a mixed emotional intelligence model (TEIQue) that combines elements of trait and ability (Petrides, 2009). In this model, emotional intelligence is considered to encompass both the ability to process and use emotional information effectively and the tendency to experience and express positive emotions.

Bar-On also developed a mixed model which includes socio-emotional skills or competencies (Bar-On, 2000, 2006). In this model, emotional intelligence is defined as a set of non-cognitive skills and competencies that enables one to cope successfully with the demands of their environment. Here, the measured dimensions are intrapersonal competencies, interpersonal competencies, adaptation competencies, stress management competencies and general mood.

Although there is no full agreement on whether emotional intelligence is a trait, a skill or a competence, researchers assume that emotional intelligence includes emotional awareness, in relation to oneself and others, professional efficiency and emotional management (Akerjordet & Sverinsson, 2007).

Measurement of emotional intelligence

The measurement of emotional intelligence depends on the conceptual model being adopted, that is, whether EI is considered a skill, a trait or a combination of both (BruLuna et al., 2021; O'Connor et al., 2019).

The most widely accepted measurement instruments are those based on Mayer and Salovey (1997), who consider emotional intelligence an innate but teachable ability, composed of various competencies that affect the way in which people understand and manage their emotions and those of others. These emotion processing competencies are: (1) perception, evaluation and expression of emotions, (2) emotional facilitation of thought, (3) understanding and analysis of emotions, and (4) reflective regulation of emotions (Bru-Luna et al., 2021). The model of Mayer and Salovey (1997) can be applied using performance-based ability tests, for example, the MSCEIT, or using self-report instruments that measure emotional abilities and emotionally intelligent behaviour, for example, the WLEIS questionnaire. There is a third approach to the measurement of emotional intelligence, the Bar-On(2000), which can be considered a mixed approach using a self-report tool on dispositions, competencies, behaviours, and perception (Ashkanasy & Daus, 2005; Walter et al., 2011).

Regarding the psychometric validity of the Salovey and Mayer model, a number of studies have questioned the construct validity as the results of factor analysis do not correspond to the four-dimensional model proposed by the authors. Statistical analysis shows a degree of redundancy between the factors (Fiori & Vesely-Maillefer, 2018) and insufficient incremental, discriminating, and predictive validity of the MSCEIT (Fiori & Antonakis, 2011). Other researchers, however, have confirmed the validity of the tool while acknowledging certain limitations (Extremera Pacheco et al., 2019; Miao et al., 2017). The WLEIS questionnaire has evidence of internal consistency, reliability, construct validity and incremental validity with respect to the Big Five model of personality (O'Boyle et al., 2011).

Relationship of emotional intelligence and other variables

Research suggests that EI is a predictor of physical and psychological health (Martins et al., 2010; Schutte et al., 2007). Regarding interpersonal relationships, studies have linked EI with pro-social behaviours and positive interpersonal relationships (Côté et al., 2011; Frederickson et al., 2012; Lopes et al., 2005). Other studies indicate that EI is significantly linked to effectiveness at work (Daus & Ashkanasy, 2005; Kotsou et al., 2019; Lopes et al., 2006; Newman et al., 2010; O'Boyle et al., 2011; Rosete & Ciarrochi, 2005; Van Rooy et al., 2005; Wong & Law, 2002), job satisfaction and organisational engagement (Miao et al., 2017), academic stress (Rojas et al., 2022), and academic achievement (Hogan et al., 2010; Humphrey et al., 2007; MacCann et al., 2020; Márquez et al., 2006).

Critical voices on emotional intelligence

From the beginning, there have been critical voices pointing out that EI is merely intelligence applied to the domain of emotions rather than a different construct. Critics question whether emotional intelligence has any predictive value on leadership and that measurement instruments such as the MSCEIT have serious validity limitations (Antonakis et al., 2009; Fiori & Antonakis, 2011). The debate has not been resolved and for some authors, the construct of emotional intelligence lacks incremental validity and clarity (Dasborough et al., 2022). Although empirical studies on emotional intelligence and its effects (e.g. on job performance) and meta-analysis have multiplied in recent years (Miao et al., 2017; O'Boyle et al., 2011), doubts persist about the measurement methodologies used and the interpretation of the results. The use of multi-source data, and performance-based tests is called for. As well as a more convincing explanatory theory (Dasborough et al., 2022). Emotional intelligence is not a panacea for everything; longitudinal studies assessing its educational impact are lacking (Humphrey et al., 2007).

It has also been pointed out that in certain contexts or in conjunction with other personality traits, EI does not seem to be as beneficial as claimed; it can be associated with high levels of stress (Ciarrochi et al., 2002), narcissism (Petrides et al., 2011; Zhang et al., 2015) and mood disorders (Fernández Berrocal & Extremera, 2006). In certain contexts, a high level of EI can be harmful (David & Nichols, 2016), when the person amplifying, for example, the perception of negative emotions (Ciarrochi et al., 2002).

Other critics point out that EI, far from being the panacea for positive interpersonal relationships, may be associated with the manipulation of the feelings and behaviour of others (Austin et al., 2007; Côté et al., 2011; Davis & Nichols, 2016; Grieve & Panebianco, 2013; Kilduff et al., 2010;). This 'dark side' of emotional intelligence was already recognised by Salovey and Mayer: 'on the negative side, those whose competencies are channelled antisocially may create manipulative scenes or lead others sociopathically to nefarious ends' (Salovey & Mayer, 1990, p. 198).

Emotional intelligence in the university environment

Studies on emotional intelligence in the university environment suggest it is a predictor of high academic performance (Bonilla-Yucailla et al., 2022; MacCann et al., 2020; Perera & DiGiacomo, 2013; Soliman et al., 2023) satisfaction and engagement in university studies (Hernández-Vargas et al., 2021; Zhoc et al., 2020). Similarly, other studies highlight the importance of developing emotional intelligence at university to stimulate professional success and leadership competencies (Castrillón & Cala, 2020; Groves et al., 2008) and connecting emotional intelligence to learning styles (Fernández Berrocal & Extremera, 2006). There are also studies that link the emotional intelligence of university students, measured through WLEIS, with self-leadership and spiritual intelligence (Samul, 2020).

There is abundant research that indicates that EI is associated with pro-social relationships and greater life satisfaction (Extremera & Fernández-Berrocal, 2014) as well as resilience and emotional repair (Cejudo et al., 2016). The influence of emotional competencies on subjective well-being has also been shown among university students (Pérez et al., 2019). Students' emotional intelligence has been positively and statistically significantly related to greater life satisfaction while cyber-victimisation is negatively and statistically significantly related to emotional intelligence and life satisfaction (García et al., 2020). A study

with university students (Urquijo et al., 2016) found that high emotional intelligence increases well-being and reduces the experience of stress among undergraduate students.

Emotional intelligence and leadership

Emotional intelligence, according to abundant research, has an influence on the exercise of leadership and its effectiveness (Côté & Miners, 2006 2006; Mills, 2009; Rosete & Ciarrochi, 2005; Sy et al., 2006; Walter et al., 2011) and, thus, on professional success (Côté et al., 2010). Emotional intelligence may even be considered a predictor of leadership (Wong & Law, 2002). However, there is scant research into the correlation between these variables among university students, especially for Latin American students (Lomboy, 2023, Mills, 2009).

According to Mayer and Salovey (1990), emotional intelligence is positively associated with mental control and adaptive emotional management. Those with greater emotional intelligence should thus have a greater ability to monitor, evaluate, and change their moods. These abilities may be assessed by measures of self-regulation or self-control. Self-control is associated with attention to feelings, clarity in the discrimination of feelings, and mood repair (Fitness & Curtis, 2005).

Good leadership points to a concept of ethical and competent leadership (Ciulla, 2004; Newstead et al., 2021). It is an approach that has ancient roots in authors such as Aristotle (1985) or Aquinas (1990). The concept of good leadership is far from naïve because it recognizes the existence of abuses in the exercise of power and therefore of leadership, which are false leaderships (López González et al., 2023). Ethical competencies associated with leadership are present in the mission statements of most universities, indicating the importance of educating for good leadership (Arias-Coello et al., 2020).

Emotional intelligence is a key factor for effective leadership by school principals. Good leadership contributes to teacher satisfaction and performance. This evidence indicates that it is important to design programmes to educate school leaders in emotional intelligence (Gómez-Leal et al., 2022). There is also a need to align the university curriculum to address interpersonal competency education considering research on emotional intelligence, experiential learning and transformational learning (Fulmore et al., 2023).

Recently, new proposals have been developed that seek to integrate emotional intelligence and leadership, even in the academic curriculum (Gkintoni et al., 2023). The EILS model proposes the integration of emotional intelligence as a core element of students' leadership education for effective leadership (Allen et al., 2012; Haber-Curran & Williamson 2023; Shankman & Allen, 2009). According to this model, emotional intelligence is a key skill in work and leadership education. EILS offers the possibility for students to learn about their skills, through self-reporting tools, and to improve them.

Research objectives

Our research aims to explore the relationship between emotional intelligence and certain leadership competencies. From the theoretical foundations presented above, our hypotheses are the following:

1. There is a positive correlation between emotional intelligence (EI) components and leadership competencies (LC).
2. There are differences between EI and leadership competencies by country, by sex and depending on the degree program of university students.
3. It is possible to establish a predictive model of leadership competencies according to the dimensions of EI.

Materials and methods

Participants

Convenience sampling was applied taking advantage of access to the student population of the universities. A total of 1101 students from three universities participated in this study: Universidad Francisco

Table 1. Composition of the sample by sex, degree program and country.

Characteristics	Total, $n = 1.101$
(Sex) *n* (%)	
Women	485 (44.05)
Men	616 (55.95)
(Degree Program) *n* (%)	
Business Administration	668 (60.67)
Education	144 (13.08)
Psychology	289 (26.25)
(Country) *n* (%)	
Chile	315 (28.61)
Mexico	463 (42.05)
Spain	323 (29.34)

de Vitoria de Madrid (Spain) (n = 323; 29.34%), Universidad Finis Terrae de Santiago (Chile) (n = 315; 28.61%) and Universidad Anáhuac (Mexico) (n = 463; 42.05%). The age of participants ranged from 18 to 52 (M = 20.66; SD = 3.101), of which 55.95% (n = 616) were men and 44.05% (n = 485) women. By type of university degree, 60.67% were studying Business Administration (n = 668), 26.25% Psychology (n = 289) and finally 13.08% were studying Education (n = 144). The composition of the sample by country, age, sex, and degree program is provided in Table 1.

Instruments

Wong and Law's Emotional Intelligence Scale (WLEIS) (Wong & Law, 2002) was used to measure EI. This tool was originally developed for the workplace in Asia; the Spanish version was validated for university students by Extremera Pacheco et al., (2019). WLEIS is based on the Mayer and Salovey model (1997) and shows good criterion validity and predictive value with respect to variables associated with life satisfaction and well-being (Extremera Pacheco et al., 2019; Urquijo et al., 2016). WLEIS is a self-report Likert-type questionnaire consisting of 16 items. The factor structure indicated by the authors (Wong & Law, 2002) corresponds to four components of four items each: 1) Self-Emotional Appraisal (SEA) evaluates the ability to perceive one's own emotions, 2) Other's Emotional Appraisal (OEA) evaluates the ability to perceive the emotions of others, 3) Use of Emotions (UOE) evaluates the ability to take feelings into account when reasoning or solving problems, and 4) Regulation of Emotions (ROE) evaluates the ability to be open and modulate personal and other feelings, promoting personal and emotional growth.

A number of six-point Likert-type scales have been used to measure leadership competencies. These scales are part of the LID model of virtue-based leadership (López González et al., 2023). Although the complete LID questionnaire includes nine competencies organised into three domains (understanding reality, relating to others, and dedication to the task), the present study used only five competencies linked to EI: '1) Insight: consists of observing reality from different perspectives and identifying its development possibilities to achieve its goal. 2) Deliberation consists of integrating multiple criteria of analysis to decide which are the best means and arranging them for action in the function of the established end. 3) Visioning consists of imagining possible scenarios for a better future, planning with flexibility in the face of possible contingencies. 4) Harmonisation consists of facilitating the relevant, timely and proportional collaboration of the members of the group, for their personal flourishing and the achievement of the common objectives. 5) Self-Mastery consists of mastery in the face of stimuli of physical or emotional gratification for personal or community good' (López González et al., 2024, p. 10).

The measurement of leadership competencies has an implicit ethical approach to the intentionality of action; that is, good leadership implies not only competence but good intention; leadership is defined as guiding others towards a common good. To some extent, this prevents leadership competencies or emotional intelligence from being used for the manipulation of others, in what has been called the 'dark side' of emotional intelligence or leadership (Davis & Nichols, 2016; Mackey et al., 2021).

Procedure

Surveys using the questionnaires were conducted from September 2022 to May 2023, and students were invited to voluntarily participate. The use of student-recruited sampling in community research

may imply a bias, since only the most cooperative students participate, thus limiting any generalisation of results (Extremera Pacheco et al., 2019). The ethics committees of the different universities authorised the use of the questionnaires in line with data privacy regulations. Participants were informed of the objectives of the study, its voluntariness, the nature and duration of their participation, the background, risks and benefits of the study, and the destination of the information through an informed consent document. The information was collected using the Jotform platform. Teachers voluntarily conducted the questionnaires in the classroom.

Data analysis

The study used a descriptive, correlational, and exploratory methodology. The data was analysed using the SPSS program. The first step was to show the means, standard deviation and internal consistency of each one of the components of EI and LC through the calculation of the Cronbach alpha (α) coefficient. Subsequently, the correlations between EI and LC through the coefficient of correlation by Pearson. The differences were also studied through a variance analysis (ANOVA) in relation of the sex, country and university studies. Finally, a regression analysis was conducted of the variables for EI and LC.

Results

Descriptive and correlation analysis

Statistical analyses were conducted to respond to the first research question regarding the correlation between the components of emotional intelligence (EI) and leadership competencies (LC).

Table 2 shows the descriptive results and correlations between the variables. The mean values, standard deviations and Cronbach's alpha are shown as an indicator of reliability.

As shown in Table 2, there are statistically significant correlations between all leadership competencies and the four dimensions of emotional intelligence (SEA; OEA; UOE; ROE). It should be noted that Cronbach's Alpha is greater than 0.5 except for 'selfmastery' which is between 0.322 and 0.399.

To answer the second research question, we analysed the differences in the variables of EI and LC by country, sex and university studies.

Differences in the dimensions of EI and LC according to sex

The differences in the dimensions of EI (Emotional Intelligence) and LC (Leadership Competencies) in terms of sex were analysed. Statistically significant differences were found only in the dimension 'Deliberation' ($t = -2.207$; $p = 0.028$) with a higher mean score among men ($M = 5.730 \pm 0.838$) than women ($M = 5.621 \pm 0.784$). No statistically significant differences were found with the rest of the dimensions (Table 3).

Table 2. Descriptive statistics (M, SD, A) and Pearson's correlation of variables.

	M	SD	A	SEA	OEA	UOE	ROE
INS	5.761	0.785	0.927	0.568	0.553	0.589	0.509
DEL	5.682	0.816	0.908	0.579	0.577	0.617	0.514
VIS	5.735	0.817	0.925	0.596	0.548	0.638	0.545
HAR	5.688	0.855	0.922	0.590	0.591	0.623	0.547
MAS	4.999	1.103	0.789	0.399	0.381	0.322	0.359
SEA	5.635	0.976	0.821		0.619	0.663	0.673
OEA	5.779	0.897	0.825			0.541	0.482
UOE	5.740	0.969	0.864				0.641
ROE	5.076	1.664	0.804				

Note: M: mean SD: standard deviation: A: Cronbach's Alpha. INS: insight; DEL: deliberation; VIS: visioning; HAR: Harmonisation; MAS: self-mastery; SEA: self-emotional appraisal; OEA: other's emotional appraisal; UOE: use of emotion; ROE: regulation of emotion. All correlations have a $p < 0.001$.

Table 3. Student's *t* for the dimensions of EI and LC by sex.

	Women $n = 485$		Men $n = 616$			
	M	SD	M	SD	T	*p*
INS	5.723	0.751	5.791	0.811	−1.423	0.155
DEL	5.621	0.784	5.730	0.838	−2.207	0.028
VIS	5.700	0.792	5.763	0.837	−1.255	0.210
HAR	5.668	0.840	5.703	0.868	−0.670	0.503
MAS	5.039	1.094	4.968	1.110	1.066	0.287
SEA	5.646	0.963	5.627	0.986	0.325	0.745
OEA	5.749	0.876	5.802	0.913	−0.964	0.335
UOE	5.712	0.959	5.763	0.977	−0.869	0.385
ROE	5.127	1.660	5.035	1.668	0.915	0.360

Note: M: mean; SD: standard deviation: t: student's t; *p*: *p*-value; INS: insight; DEL:deliberation; VIS: visioning; HAR: harmonisation; MAS: self-mastery; SEA: self-emotional appraisal; OEA: other's emotional appraisal; UOE: use of emotion; ROE: regulation of emotions. All correlations have a $p < 0.001$.

Differences in the dimensions of LC and EI depending on the country

Differences between countries were found in all leadership competencies, with students from Mexico scoring highest, followed by Chile and finally Spain. Figure 1 shows the averages for each of the leadership competencies by country.

For the dimensions of emotional intelligence, differences were also found in the different countries (see Figure 2), with students from Mexico once again obtaining higher scores than those from Chile, and Chile above Spain.

Table 4 shows the results of the analysis of variance (ANOVA-one way) of the dimensions of EI and LC according to country. For Insight (F (2;698.26) =43.632; $p < 0.001$) and Deliberation (F (2;1098) =40.898; $p < 0.001$) higher scores are shown in students from Mexico with respect to those from Chile and Spain ($p < 0.001$), and in those from Chile they are higher than those from Spain ($p < 0.001$). In Visioning (F (2;1098) =40.898; $p < 0.001$) and Harmonisation (F (2;1098) = 25.614; $p < 0.001$) higher scores are also shown for students from Mexico and Chile with respect to Spain ($p < 0.001$), and from Mexico with respect to Chile ($p = 0.022$; $p = 0.012$). In Self-mastery (F (2;696.81) =17.020; $p < 0.001$), Self-Emotional Appraisal (F (2;1098) =14.914; $p < 0.001$) and Other's Emotional Appraisal (F (2;679.84) =12.623; $p < 0.001$), higher scores were shown for Mexico with respect to Spain and Chile ($p < 0.001$), but no significant differences were found between Chile and Spain. In Use of Emotion (F (2;1098) =21.524; $p < 0.001$), Mexico also scored above Chile ($p = 0.037$) and Spain ($p < 0.001$), and Chile above Spain ($p = 0.001$). In Regulation of Emotions (F (2;673.11) =15.408; $p < 0.001$), Mexico ($p < 0.001$) and Chile ($p = 0.005$) above Spain, but there was no difference between Mexico and Chile.

Significant differences were more relevant in the Insight and deliberation competencies, with an eta-squared around 0.07 indicating a medium effect, but with a lower eta-squared effect in the other competencies.

Differences in the dimensions of EI and LC by degree program of the students

Table 5 shows the results of the differences in the dimensions of EI and LC according to the degree program of the students. An analysis of variance (ANOVA-one way) was also carried out, finding more differences in Insight and Deliberation depending on the degree program, although these were not as significant as the differences by country when considering the effect size.

Significant differences were found in the dimension of Insight (F (2;344.381) = 8.291; $p < 0.001$), showing higher scores for psychology students ($p < 0.001$) and those of business administration ($p = 0.010$) compared to those studying education. In Deliberation (F (2; 348,699) = 7760; $p < 0.001$), psychology students had higher scores than business administration students ($p = 0.004$) and education students ($p = 0.003$). In Visioning (F (2; 1098) = 5.450; $p = 0.004$) students of psychology ($p = 0.004$) and those of business administration ($p = 0.013$) had higher scores than those of education. In Harmonisation (F (2; 342.919) = 4.329; $p = 0.014$), psychology scored higher than education ($p = 0.010$). In Self-domain (F (2;1098) = 3.363; $p = 0.035$), business administration scored above education ($p = 0.030$). In Other's Emotional Appraisal (F (2;1098) = 6.328; $p = 0.002$) psychology scored above business administration

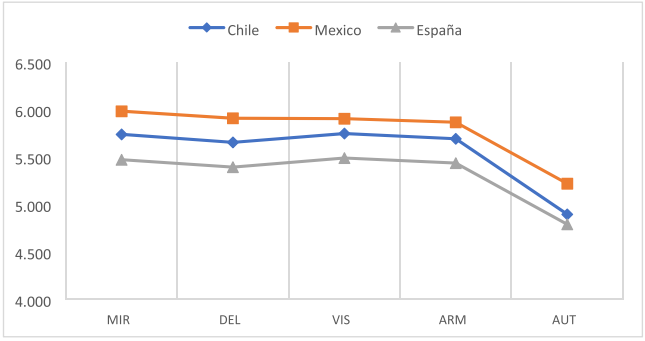

Figure 1. Mean scores on leadership competencies by country.

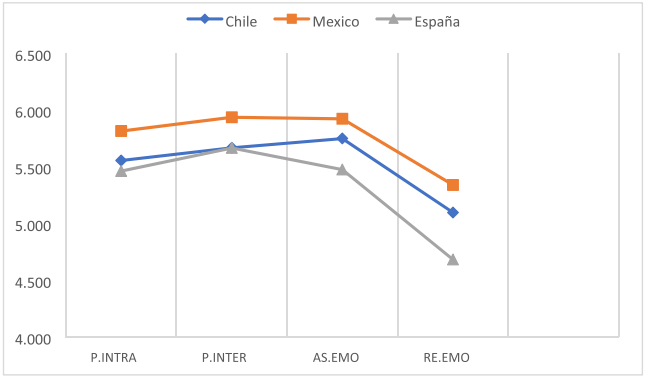

Figure 2. Mean scores on dimensions of emotional intelligence by country.

Table 4. Differences in EI and LC dimensions by country. ANOVA one-way.

	Chile $n = 315$		Mexico $n = 463$		Spain $n = 323$				
	M	SD	M	SD	M	SD	F	p	eta 2
INS	5.74	0.71	5.98	0.8	5.47	0.74	43.63	<0.001	0.074
DEL	5.65	0.77	5.91	0.82	5.39	0.76	40.9	<0.001	0.069
VIS	5.74	0.8	5.9	0.83	5.49	0.75	25.61	<0.001	0.045
HAR	5.69	0.85	5.86	0.85	5.43	0.8	25.2	<0.001	0.044
MAS	4.89	1.1	5.22	1.15	4.79	0.98	17.02	<0.001	0.03
SEA	5.55	1.03	5.81	0.94	5.46	0.94	14.91	<0.001	0.025
OEA	5.67	0.97	5.94	0.88	5.66	0.81	12.62	<0.001	0.022
UOE	5.75	0.99	5.92	0.92	5.47	0.96	21.52	<0.001	0.037
ROE	5.1	1.7	5.34	1.59	4.68	1.67	15.41	<0.001	0.027

Note: M: mean SD: standard deviation: A: F: Snedecor F; *p*: *p*-value; eta 2: eta squared effect size; INS: insight; DEL: deliberation; VIS: visioning; HAR: harmonisation; MAS: self-mastery; SEA: self-emotional appraisal; OEA: other's emotional appraisal; UOE: use of emotion; ROE: regulation of emotion. All correlations have a $p < 0.001$.

Table 5. EI and LC dimensions by program degree. ANOVA one-way.

	Business $n = 668$		Education $n = 144$		Psychology $n = 289$				
	M	SD	M	SD	M	SD	F	Eta 2	*p*
INS	5.76	0.76	5.52	0.92	5.88	0.74	8.29	0.018	<0.001
DEL	5.66	0.81	5.52	0.96	5.82	0.73	7.76	0.014	<0.001
VIS	5.75	0.81	5.54	0.91	5.80	0.78	5.45	0.010	0.004
HAR	5.70	0.83	5.48	1.03	5.77	0.80	4.33	0.010	0.014
AUT	5.05	1.10	4.79	1.07	4.98	1.12	3.36	0.006	0.035
SEA	5.64	0.98	5.51	1.05	5.68	0.93	1.49	0.003	0.225
OEA	5.71	0.90	5.76	0.93	5.94	0.84	6.33	0.003	0.002
UOE	5.78	0.95	5.51	1.04	5.77	0.98	4.93	0.009	0.007
ROE	5.12	1.67	4.82	1.72	5.11	1.62	1.97	0.004	0.140

Note: M: mean; SD: standard deviation: F: snedecor F; *p*: *p*-value; INS: insight; DEL: deliberation; VIS: visioning; HAR: harmonisation; MAS: self-mastery; SEA: self-emotional appraisal; OEA: other's emotional appraisal; UOE: use of emotion; ROE: regulation of emotions. All correlations have a $p < 0.001$.

($p = 0.001$). In emotional assimilation (F (2;1098) = 4.930; $p = 0.007$), psychology students ($p = 0.024$) and business administration students ($p = 0.006$) had higher scores than education students. No significant differences were found in Self-Emotional Appraisal (F (2;1098) =1.492; $p = 0.225$) or Regulation of Emotions (F (2;673.11) =1.968; $p = 0.140$).

Predictive models of the leadership competencies according to EI dimensions, country and degree

The third objective of the study was to generate regression models that predict the leadership competencies of students based on the dimensions of emotional intelligence.

The results are provided in Table 6 .

These models meet the assumptions of linearity between the predictive variables and criterion, homoscedasticity and normality of the residuals, independence of the residuals with values between 1.5 and 2.5 of Durbin-Watson (Pardo & Ruiz, 2005). The values for variance and tolerance were adequate.

As shown in Table 6, we can generate predictive models of leadership competencies except for self-mastery. For all other competencies (Insight, deliberation, visioning, and harmonisation) we have generated a multiple regression model in which the four dimensions of EI are included, the most explanatory being the dimension of Use of Emotions, followed by Other's Emotional Appraisal, Self-Emotional Appraisal and Regulation of Emotions. The models indicate that the best explained competence was Harmonisation (r2 = 0.501), followed by Deliberation (r2 = 0.479), Visioning (r = 0.490) and Insight (r2 = 0.446). These values would increase slightly (the increase of r2 would be less than 0.1) if we included as dummy variables the country and degree of the students.

Discussion

The results permit various observations that point to future lines of research, among which we can highlight the following:

1. The internal consistency of all scales of LID, measured by Cronbach's Alpha, is very good (somewhat lower for the competence 'self-mastery', which is 0.789). The internal consistency of EI scales varies between 0.804 and 0.864, closely approximating previous studies by Wong et al. (2022). Specifically, the results of Cronbach's Alpha in the study by Wong et al. (2022) for each dimension of EI were: Self-Emotional Appraisal, 0.87; Other's Emotional Appraisal, 0.90; Use of Emotions or assimilation, 0.84; and Regulation of Emotions, 0.83. In our case, the values of Cronbach's Alpha are: Self-

Table 6. Multiple regression model of leadership competencies according to EI.

Criterion	R^2	D-W	Predictive variables	Beta	T	*p*	T	FIV
INS	0.446	1.946	(Constant)	2.205	16.500	0.000		
	0.347		Use of emotion	0.231	8.720	0.000	0.472	2.117
	0.424		Other's emotional appraisal	0.224	8.713	0.000	0.586	1.707
	0.441		Self-emotional appraisal	0.124	4.301	0.000	0.394	2.535
	0.446		Regulation of emotions	0.047	3.095	0.002	0.479	2.090
DEL	0.479	1.938	(Constant)	1.803	13.397	0.000		
	0.380		Use of emotion	0.273	10.247	0.000	0.472	2.117
	0.463		Other's emotional appraisal	0.252	9.752	0.000	0.586	1.707
	0.477		Self-emotional appraisal	0.117	4.028	0.000	0.394	2.535
	0.479		Regulation of emotions	0.038	2.492	0.013	0.479	2.090
VIS	0.490	1.883	(Constant)	1.928	14.458	0.000		
	0.407		Use of emotion	0.292	11.045	0.000	0.472	2.117
	0.464		Other's emotional appraisal	0.187	7.312	0.000	0.586	1.707
	0.485		Self-emotional appraisal	0.135	4.704	0.000	0.394	2.535
	0.490		Regulation of emotions	0.057	3.714	0.000	0.479	2.090
HAR	0.501	1.807	(Constant)	1.624	11.758	0.000		
	0.407		Use of emotion	0.264	9.660	0.000	0.472	2.117
	0.464		Other's emotional appraisal	0.276	10.386	0.000	0.586	1.707
	0.485		Self-emotional appraisal	0.068	4.327	0.000	0.479	2.090
	0.490		Regulation of emotions	0.108	3.616	0.000	0.394	2.535

Note: INS: insight; DEL: deliberation; VIS: visioning; HAR: harmonisation; MAS: self-mastery; SEA: self-emotional appraisal; OEA: other's emotional appraisal; UOE: use of emotion; ROE: regulation of emotions. All correlations have a $p < 0.001$.

Emotional Appraisal, 0.82; Other's Emotional Appraisal, 0.82; Use of Emotions or assimilation, 0.86; and Regulation of Emotions, 0.80. The results of the validation carried out by Extremera Pacheco et al. (2019) were also similar; Cronbach's Alpha calculated for each dimension were slightly lower except for Regulation of Emotions: Self-Emotional Appraisal, 0.79; Other's Emotional Appraisal, 0.81; Use of Emotions, 0.81; Regulation of Emotions, 0.84.

2. There are significant correlations (measured by Pearson's correlation coefficient) between EI and LC variables which is consistent with previous research (e.g. Miao et al., 2017; 2021). The lowest correlation is between self-mastery and emotional intelligence (less than 0.5). It seems that the competence of self-mastery is more distant, with a lower correlation, not only with respect to the dimensions of emotional intelligence but also with all other leadership competencies. Hypothetically, emotional intelligence is related to self-mastery, understood as mastery over physical or emotional gratification by personal or common good. Studies by Fitness and Curtis (2005) found a correlation between self-control and emotional intelligence. Further research is required to identify whether this low correlation of self-mastery with other variables is due to a problem of scale construction (since its Cronbach's Alpha is 0.789, the lowest of all) or to a distance between the constructs.
3. The component of emotional intelligence that correlates highest with leadership competencies is Use of Emotions, which is related to the use of emotions in order for action. By contrast, Regulation of Emotions correlates the lowest. This is significant since, although the dimensions of emotional intelligence are linked to each other, it is plausible to consider that the use of emotions is the most relevant dimension for the exercise of leadership. It would be instructive to explain why certain dimensions of emotional intelligence have a higher correlation with leadership competencies and greater predictive value (cf. Görgens Ekermans & Roux 2021). This requires a theoretical model that integrates leadership and emotional intelligence.
4. There are no significant differences in relation to sex. In the validation of WLEIS carried out with Spanish students by Extremera Pacheco et al. (2019) it was found that women obtained significantly higher results than men. Women generally perform better in emotional intelligence which in turn is reflected in better leadership performance in models that emphasize relationality (Hsu et al., 2022). Other studies show no significant differences according to gender (Lomboy, 2023; Miao et al., 2017). According to a study conducted in Spain, the measurement of emotional intelligence through self-reporting may be influenced by gender stereotypes (Lopez-Zafra & Gartzia, 2014). Further studies should be carried out to conclude whether sex is a significant variable for emotional intelligence in Spanish speaking students.
5. There are significant differences in some variables depending on the degree program studied by the students. Psychology students obtain higher results than those of education in some leadership competencies linked to the understanding of reality especially in 'Insight' and slightly in 'Deliberation', as well as in a component of emotional intelligence (Other's Emotional Appraisal) but there are no differences when taking the emotional intelligence construct as a whole. A plausible explanation is that, in the choice of degree program, students interested in studying psychology have a higher EI, due to its importance for their future profession. This study is plausible with the hypothesis that students in social sciences have or develop a higher emotional intelligence than students in experimental sciences or engineering (cf. Zhoc et al., 2020).
6. There are significant differences in the country or university of the students. Those from the University of Mexico obtain the highest results in both emotional intelligence and leadership competencies, followed by students from the University of Chile and finally from the University of Spain. The differences are higher in the competencies of Insight, Deliberation and Visioning, which are related to understanding reality (López González et al., 2023). One plausible explanation is that Mexican students tend to score higher than Spanish students, at least on questionnaires measuring subjective well-being (Carballeira et al., 2015). However, our results regarding the dimensions of EI measured with the WLEIS differ from the results of López-Zafra and Gartzia (2014) with students from Portugal, Mexico and Spain given that in this study Spanish students obtain the highest results in the appreciation of the emotions of others. Further research is required to explain the differences between countries in terms of leadership competencies.

7. Regression analyses suggest that education in emotional intelligence, especially in terms of Use of Emotions, can influence the development of leadership competencies. This study supports the hypothesis that emotional intelligence is predictive of student's leader behaviors (e.g. participation, engagement …) and effective outcomes (Allen et al., 2012). Emotional intelligence can be taught at university as well as other personal competencies, including leadership. A competence-based conceptualisation of emotional intelligence, such as that of Mayer et al. (1999) may be suitable for this purpose.

Conclusions

The study shows the positive correlation and predictive value of emotional intelligence with respect to leadership competencies, in particular the dimension 'use of emotion', confirming our hypothesis and previous research (cf. Alshammari et al., 2020; Halimi et al., 2021). It is possible to establish a predictive model of leadership competencies according to the dimensions of EI, with the variable 'use of emotions' being the most relevant.

Emotional intelligence has been identified as a crucial variable in education in leadership within higher education (Bryman, 2007; Parrish, 2015, Sadri, 2012). Educating university students in good leadership requires educating them in emotional intelligence, especially for those who have to exercise leadership in the field of health and service to others (Dugué et al., 2021). This study provides evidence on which components of emotional intelligence and which leadership competencies are interrelated. It also provides international comparative evidence from three countries where there is little previous research: Spain, Mexico and Chile. In particular, it shows significant differences between countries and between degree programs.

This study has certain limitations that should be considered for future research. There are methodological limitations due to the cross-sectional nature of the study, which does not allow causal relationships to be established. Also, the sample is limited in size and was obtained through non-random purposive sampling. The use of the self-report questionnaire, on the other hand, may generate biases in the subject's perception at the time of evaluation. Despite these limitations, the methodology allows sufficient inferences to be drawn to corroborate the hypotheses.

On the other hand, a deeper conceptual review of the concept of emotion, and in particular emotion appraisal in relation to emotional intelligence, is required (Mortillaro & Schegel, 2023). University education today focuses on the cognitive but does not sufficiently address emotional education. To this end, it is essential to understand emotions in the framework of the dynamism of human action with a view to their education (López González, 2024).

Universities are particularly suitable environments for leadership development (Brooks et al., 2019; Dugan & Komives, 2010). It would be helpful to establish a theoretical and empirical model to educate in good leadership (López González et al., 2023) incorporating emotional education as a key component of leadership (Allen et al., 2012; Haber-Curran & Williamson 2023; Lomboy, 2023; Shankman & Allen, 2009). The university curriculum should take these proposals into account for both student education and teacher training, supported by evaluation results (Gkintoni et al., 2023). Methodological rigor and conceptual clarity are essential for effective intervention programs (Zeidner et al., 2002) and the present study contributes to this end.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

Data sharing is applicable upon reasonable request.

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