Article

A virtue-based measurement of leadership education: The LID questionnaire

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Abstract: This article presents the validation of a virtue-based leadership development questionnaire (LID). Leadership is defined as the human action of guiding others toward a common good, which requires the exercise of personal competencies and virtues. The theoretical and factorial structure of LID has three domains: intellectual, relational and performative. The LID was administered to a sample of 1759 university students from Mexico and Spain for factor analysis. Subsequently, it was applied to a sample of 1906 students from a Mexican university for confirmatory factor analysis and to 171 Mexican students for a convergent validity study with the Socially Responsible Leadership Scale (SRLS). Psychometric analyses indicate that the questionnaire is reliable and valid. Confirmatory factor analysis indicates that the questionnaire fits the theoretical model and has convergent validity with the SRLS. This questionnaire aims to contribute to the leadership education of university students.

Keywords: virtue; character education; competencies; leadership education; university students

1. Introduction

University is a critical stage for young people to develop their leadership skills, learn to relate to others, and engage responsibly in shared tasks (Dugan and Komives, 2010; Johnson et al., 2023; Komives et al., 2009; Liu et al., 2021; Reyes et al., 2019). In some universities, leadership education is seen as part of the institutional mission, often linked to virtues and values (Arias-Coello et al., 2020; Breznik and Law, 2019; Morphew and Hartley, 2006). This aspiration is also reflected in the abundance of leadership courses at the university level (Komives and Sowcik, 2020). Virtue-based leadership education is key to prepare engaged and responsible citizens (Bok, 2020, Brooks et al., 2024). However, it is rare for universities to have a leadership education framework that considers virtues (Brooks et al., 2019; Brooks, 2021) and evaluates them from an educational perspective. In a previous publication, we presented and theoretically justified a virtues-based model of leadership education and assessment (Lopez González, et al., 2023). We have previously published the theoretical and methodological foundations of the present model (López González and Ortiz de Montellano, 2021; López González, 2022a; López González et al., 2023). We have also used an incomplete version of LID to study the relationship between virtuous leadership and emotional intelligence through the WLEIS scale (López González et al., 2024).

The present research seeks to contribute to the understanding of virtuous

leadership as a key factor in personal development and organizational performance (Cameron et al., 2004; Ciulla, 2004; Hendriks, 2021; Newstead et al., 2021; Pearce et al., 2006) and to the validation and use of instruments for its measurement, especially at the university level (Dami et al., 2024; Hackett and Wang, 2012; Lomboy, 2023; Riggio et al., 2010).

This research presents a questionnaire (LID) for the evaluation of virtue-based leadership education. First, the theoretical basis for the design of the instrument is presented. Next, the method and procedure used to design and analyze the psychometric properties of the instrument are described. Third, the psychometric results of each of the scales of the questionnaire are reported. Fourth, a discussion of the results obtained is offered. As a conclusion and perspective, it is shown that the LID questionnaire has good psychometric properties for the measurement of competencies and virtues, and some tasks are proposed to use the questionnaire and to continue the validation of the construct.

The validity evaluation of the LID questionnaire is complemented by a convergent validity study with the SRLS scale. The SRLS (Dugan, 2015; Tyree, 1998) is one of the most widely used leadership measurement tools among university students. Considering that both LID and SRLS measure similar elements of university students' leadership development, it is expected that there is convergent validity between the two scales, albeit with differences due to their theoretical models and the dimensions they measure.

Based on the background and theoretical foundation described in the following section, the general objective of this research is to design and validate a leadership assessment instrument for university students. The specific objectives are:

1) To calculate the mean, standard deviation and reliability of the competencies of the LID questionnaire.

2) To analyze the mean differences between Mexican and Spanish students in the three domains of the LID questionnaire.

3) To determine the factor structure of the LID questionnaire.

4) To analyze the convergent validity between LID and SRLS questionnaires.

2. Theoretical basis for the LID questionnaire

The phenomenon of leadership has been studied under organizational paradigms with different epistemological assumptions, methodological preferences, and languages. The functionalist paradigm understands leadership as influence aimed at achieving functional equilibrium, while the political paradigm understands leadership as power linked to social domination. A third paradigm sees leadership as positive action in service to the community (López González, 2022b).

Our proposal is in line with this third paradigm and understands leadership as the act (or, more precisely, the process that links different acts) of guiding others towards a common good (López & Ortiz de Montellano, 2021; López et al., 2023). The exercise of good leadership requires certain competencies and the practice of the cardinal virtues: prudence, justice, fortitude and temperance. These cardinal virtues are important in different religious and cultural contexts and are well suited to support a model of leadership education (Hackett and Wang, 2012; Riggio et al., 2010).

According to Aristotle (1985), virtue is a habit (héxis in Greek): a firm inner disposition that enables one to act well; a stable and well-motivated disposition to act (Fowers et al., 2021). Virtuous action requires good intention and good execution, or competence (Ciulla, 2004; López González, 2022a; Newstead et al., 2021). Competence refers to the complete and adequate performance of tasks (Hager and Gonczi, 2009). Virtue also requires right desires for good reasons (Alzola, 2012).

Leadership as a human action has five basic characteristics: 1) leadership is a movement in which people put their capacities into action to achieve a goal, 2) it is relational; it is carried out between two or more people, 3) it is personal, although we can wrongly attribute it to a collective, 4) it is intentional and motivated by the search for a good as an end, 5) charity and prudence inform the other virtues so that they can be fully developed (López González et al., 2023). This conceptualization corresponds to an Aristotelian-Thomistic perspective of human action (Aquinas, 1981; Aristotle, 1985).

Everyone exercises leadership at certain times or in certain situations in our professional, personal, or civic lives. "Guiding others is not an exceptional act of a few, but an action that we all carry out in certain circumstances. It is important to learn when and how to lead others, just as it is important to learn how to be led by others, depending on the circumstances" (López González et al., 2023, p. 8). A person who exercises virtuous leadership does not seek to be a leader, but rather to achieve a good for others. Virtues are associated with both leadership and followership. In the dynamics of human action, virtues are an indirect result, an effect, of this search for the good (López González, 2024; Spaemann, 2003)

Leadership education helps to prevent and correct the "dark side" of leadership: abuse of authority, paternalism, narcissism, or manipulation (Einola and Alvesson, 2021; Hogan et al., 2021; Tourish, 2013). A student who has been educated in virtue-based leadership will have a more developed theoretical and practical knowledge from which to recognize his or her own and others' leadership abuses, or even to freely confront those who exercise leadership poorly (López González et al., 2023).

According to the model of leadership education that we have adopted, the exercise of leadership requires of the person an understanding of reality (intellectual domain), a relationship with others (relational domain), and a dedication to the task (performative domain). In these three areas or domains, it is possible to identify certain cardinal virtues and competencies that are entangled (Sturm et al, 2017).

Table 1 shows the virtues, competencies and faculties included in the leadership education model that serves as the basis for the LID questionnaire.

The competencies included in the educational model are defined below (López González et al., 2023):

- Insight consists of observing reality from different perspectives and identifying developmental possibilities to achieve a goal.
- Deliberation involves integrating multiple analytical criteria to decide which means are the best and arranging them for action in accordance with the established goal.
- Visioning consists in imagining possible scenarios for a better future, planning with sufficient flexibility to face possible contingencies.
- Inspiration is the creation and communication of a vision in a motivating way in

order to achieve common goals.

- Harmonization consists in facilitating the relevant, timely and proportional collaboration of the members of a group, for their personal growth and the and the achievement of common goals.
- Accompaniment consists in helping others to understand their personal situation, to make decisions about their vocation and to provide emotional support for its realization.
- Commitment consists in the effort and continued dedication to a task with a view to the future realization of a good for the community for which one feels responsible.
- Resilience is calmly facing and resisting adverse situations, taking risks when necessary.
- Self-mastery consists of discipline when assaulted by the stimuli of physical or emotional gratification for personal or community good.

Table 1. Leadership education model.

Educational domain	Cardinal Virtue	Main faculty	Competencies	Description
Understanding of reality	Prudence	Intelligence	Insight	Looking at reality without distortion
			Deliberation	Weighing up and deciding the best alternatives
			Visioning	Imagining and articulating future scenarios
Relationship with others	Justice	Will	Inspiration	Inspiring others to do good
			Harmonisation	Integrating the participation of others
			Accompaniment	Illuminating and sustaining others on the path
Dedication to the task	Fortitude and Temperance	Affectivity	Commitment	Engaging and sustaining commitments
			Resilience	Maintaining stability in the face of difficulty
			Self-mastery	Responding adequately to emotional stimuli

Source: López González et al. (2023).

The following sections provide a review of the literature we have used, based on the Aristotelian-Thomistic paradigm, to support each of the competencies and virtues grouped within the three domains that make up the triple construct of leadership education. The Aristotelian-Thomistic paradigm is sufficiently broad as a metamodel to accept contributions from authors who, without necessarily sharing the same vision of leadership, may offer valid elements that are compatible with our model of virtuous leadership education (López González and Ortiz de Montellano, 2021).

2.1. Understanding of reality

The domain of Understanding of reality brings together competencies and intellectual virtues that are important for leadership. Intellectual virtues are mental habits that lead to good thinking and reasoning (Costa and Kallick, 2008). The development of intellectual competencies is essential to the development of intellectual virtues. Virtues and competencies should not be confused with other involuntary characterological qualities (Baher, 2022).

In the human individual, we can distinguish different capacities (intelligence, will, affectivity), which interact with each other and converge in human action. For

example, rational deliberation and decision-making require emotions or feelings for accurate, efficient, and timely decisions (Damasio, 2021). Intellectual virtues are linked to moral virtues; they are a prerequisite for morally responsible actions that lead to human flourishing (Baher, 2013). Although intellectual virtues have their own object or domain, their ultimate purpose is also moral (Baher, 2017; Brady, 2017).

There is an extensive list of intellectual virtues to cultivate (Baher, 2022; King, 2022). In our case, we have chosen the virtue of prudence, which is the virtue that integrates the others and allows us to act with good judgment. Prudence moderates the exercise of leadership, including virtues such as courage, for the good of the person exercising it and the group (Rego et al., 2023). Living with prudence involves thoughtful deliberation, sound judgment, and firm implementation of decisions. To live with prudence (phronesis in Greek) is to have an open mind to recognize the true diversity of things and situations that can be experienced (Jubilee Centre, 2022). In keeping with this perspective, we have chosen three educational competencies: insight, deliberation, and visioning.

Insight consists of a deep understanding of reality that is not limited to appearances and captures its complexity (González-Iglesias and De la Calle-Maldonado, 2020; López Quintás, 2014). Insight involves understanding the latent possibilities of reality; it involves considering different perspectives, evaluating trends and different perspectives, making explicit assumptions, and questioning these assumptions (Yorks and Nicolaides, 2012). Insight involves three dimensions: interpreting the meaning of reality and its possibilities for development, being open to different ideas or those expressed by people who think differently and using different methods to better understand reality.

For Aristotle, deliberation refers to the choices that lead to a decision to take a particular action (Aristotle, 1985). The end point of deliberation is a decision. Deliberation involves practical reasoning about the best means to achieve ends related to desires. But it is also a critical reflection aimed at harmonizing and evaluating the goodness of courses of action and even ends (Vigo, 2012). In our model, we have identified three dimensions of deliberation: visualization of courses of action, evaluation of alternatives, and integration of criteria for decision making.

Visioning consists of imagining a better future, with a sense of urgency and acceptance of loss, planning a new path, and taking more flexible positions in case of contingencies. Visioning indicates where the change process will lead (Kanter, 2020) and what goals will be pursued (Kotter, 1996), but should not be so specific that the actions of the vision become ends in themselves (Stouten et al., 2018). There are three domains that we have included in the LID questionnaire based on this approach: imagining the possibilities for change, planning a new path, and flexibility in case of contingencies.

2.2. Relationship with others

All theories recognize that leadership is a relational phenomenon, although the way relationships are conceived can be very different from one theory to another (López González, 2022b; López and Ortiz de Montellano, 2021). We selected three pedagogical competencies: inspiration, team harmonization and accompaniment.

Regarding the competence of inspiration, we can identify three dimensions: future orientation, executive communication, and motivation to act. Exercising leadership requires envisioning the future by imagining exciting and ennobling possibilities, and engaging others by motivating around a common vision by appealing to shared aspirations (Kouzes and Posner, 2023). Inspiration also requires effective communication of information (Toseef et al., 2022). Leaders communicate a promising vision of the future and motivate followers to commit to the organization's vision (Avolio and Bass, 2004). Dialogue, transparency, and positive energy are often associated with inspirational leadership (Salas-Vallina et al., 2020).

Within harmonizing competence, we can consider three dimensions: conflict management, moderation of expectations, and interorganizational representation. Conflict management helps harmonize the interpersonal differences inherent in work teams. Harmonization must be addressed preventively, balancing the excesses of individualism or collectivism in the organization in the interest of improved functioning (Di Fabio and Tsuda, 2018). Moderating expectations in the exercise of leadership encourages all members of the group to be aware of each other's points of view. Good leadership helps to reduce stress and resolve conflicts (Tran et al., 2020). Harmonization also includes representation before other departments of the organization to which it belongs, ensuring that the group carries out its work according to the parameters set by the organization (Gorjón, 2017).

Finally, with regard to the competence of accompaniment, there are also three key dimensions: enlightenment in personal knowledge, support for personal responsibility in decision making, and emotional support. Accompaniment can be understood as an intentional pedagogical action aimed at helping and supporting people in their efforts to know themselves and to make decisions that promote their personal growth and development (Crespí and López González, 2023). It is a process in which learning takes place in interaction with respect and freedom (García-Pérez and Mendía, 2015). Accompaniment involves taking the other person's side in a shared journey in search of truth, personal growth, and personal fulfillment (Armstrong and Spears, 2018; Chestnutt et al., 2023).

2.3. Dedication to the task

In the definition of leadership, we formulated earlier, the relationship with others is explicit. Dedication to a task, however, is implicit: one is supposed to lead others in accomplishing a task toward an end. Leadership is embedded in a larger common task. Thus, it is necessary to understand what needs to be done and how to do it, how to accomplish a task with a group of people of which one is a part and which one serves through the exercise of leadership. Research suggests that better or worse task performance is associated with the exercise of leadership, especially when the task requires collaboration among people or when the tasks are poorly structured (Dehghanan et al., 2021; Wang et al., 2011).

In the area of Dedication to the task, we selected three competencies: commitment, resilience, and self-control. These three competencies are necessary to perform arduous tasks that require sacrifice, postponement of gratification, and overcoming fatigue, laziness, or fear. These three competencies are related to the

virtues of fortitude and temperance, which regulate the irascible and concupiscible appetites (Aquinas, 1981). Fortitude allows us to resist, to engage, and to take initiative, all of which are key to exercising leadership. Temperance involves mastery (and freedom) over the tendency toward physical or emotional gratification in order to achieve a personal and common good (Titus, 2006).

Commitment to others, as ethical stewardship in shared tasks, is linked to the development of socially responsible leadership (Caldwell et al., 2015; Dugan and Komives, 2010). Within the competence of commitment, we can identify three key dimensions: a sense of community, personal dedication, and future perspective. Community forms the individual so that they can live in plenitude the gift that they represent for others and freely accept the gift from others. The sense of community facilitates and enlarges the individual, admitting elements from the world around them (Daloz, 2015). The second dimension, personal dedication, refers to the attention and dedication to their community, passionately devoting their time, willing to make personal sacrifices if necessary. Finally, there is the dimension of future perspective. To develop the competence of commitment the individual must make a promise of continuity, of a future. The greatness of the human individual lies in the fact that they are able to put themselves above time (Schönborn, 2017). Anticipating the results of their actions makes it easier for the person to be motivated by the actual learning tasks. (Burga et al., 2017). This dimension of future perspective is intertwined with the vision of change, because as Hannah Arendt (2003) states, to promise is to colonize the future.

3. Methodology

3.1. Procedure and instruments

The design of the LID questionnaire followed two stages. In the first stage, a literature review was conducted, and the items were developed based on the delimitation of the three domains and their competencies, following the methodology developed by Tapia and Cardona (2021). In the second stage, a review of the items was carried out by the authors. Precise definitions were formulated for each of the competencies identified. The initial set of the questionnaire consisted of 135 items. A five-point Likert scale was used for the response options (López González et al., 2023).

Afterwards, Study 1 was conducted to determine the psychometric properties of the LID questionnaire, to identify the differences between the means of the samples of university students from Mexico and Spain, and to analyze the factorial structure of each of the three domains. An exploratory and confirmatory factor analysis was performed for each of the three domains. The application of Study 1 was carried out using the digital platforms Google Forms and Jotform, between September 2022 and April 2023. After the application of the questionnaire, the items were refined by taking as criteria for exclusion items with factor loadings below 0.5, according to the recommendations of Osborne and Costello (2004). As a result, an instrument of 5 items was obtained for each competence (15 for each domain), with a total of 45 items that make up the first version of the LID questionnaire in its short form (see Appendix).

Subsequently, a new study (Study 2) was conducted in August 2023 with another

sample of students from a Mexican university to test its factor structure and psychometric properties. All applications were carried out using the digital platforms Google Forms and Jotform. As part of Study 2, convergent validity between the LID and the SRLS was conducted using a subsample of students. The SRLS (Dugan, 2015; Tyree, 1998) is one of the most widely used leadership measurement tools among university students. The SRLS scale, in its 34-item short version, has been designed, validated, and applied to measure socially responsible leadership in university students, even in a sample of Mexican students with characteristics similar to those used in our studies (Dugan et al., 2011). Several studies have shown that the SRLS correlates with student involvement and transformational leadership (Dugan, 2006, 2015).

3.2. Samples

Convenience sampling was used, taking advantage of the collaboration between the universities in both studies. Approval was obtained from the ethics committees of the universities, and the scales were administered to the students after informing them of the purpose of the study and guaranteeing the confidentiality of their information.

LID was applied to a sample of 1759 university students from Mexico and Spain for exploratory factor analysis (Study 1). The distribution of the sample is shown in **Table 2**.

Table 2. Sample size of LID (Study 1) by country and educational domain.

Country	Educational domain		
	Understanding of reality (N = 813)	**Relationship with others (N = 434)**	**Dedication to the task (N = 512)**
Spain	328	187	242
Mexico	485	247	270

Subsequently (Study 2), it was applied to a sample of 1906 (748 men and 1158 women) students from different disciplines and cohorts from a Mexican university for confirmatory factor analysis. As part of Study 2, the sample used for the convergent validity study between the LID and SRLS questionnaires was 171 students from different disciplines and cohorts (114 men and 57 women).

3.3. Analysis of data

In order to achieve objective 1, a reliability analysis was performed by calculating Cronbach's alpha for each of the competencies. The mean and standard deviation were also calculated.

To accomplish objective 2, Student's t was calculated for mean differences in independent samples, and Cohen's d was calculated to measure effect size.

To accomplish objective 3, an exploratory and confirmatory factor analysis of each domain was performed using the maximum likelihood method.

To achieve objective 4, the Pearson correlation coefficient was calculated between the dimensions measured by LID and SRLS. SPSS V 29.0.1.0 and Amos V 29.0.0.0.0 software were used for these analyses. RStudio 2023.03.0. and Jamovy 2.3.28 software were used to perform the results of the confirmatory analysis.

4. Results

The main findings of the three studies are presented below. The results are presented in the order of the four research objectives.

4.1. Means, standard deviation and reliability of LID

The reliability (alpha of Cronbach) of each of the competencies obtained in the application of Study 1 was between 0.70 and 0.94. After refining the questionnaire (see Appendix) and applying it to a new sample of 1906 students (Study 2), the reliability, mean and standard deviation of each of the competencies of LID are shown in **Table 3**.

Table 3. Mean, standard deviation and reliability of LID's competencies (Study 2).

Competencies	Domain	Statistics		
		Mean	**SD**	**Cronbach Alpha**
Insight		21.07	2.780	0.761
Deliberation	Understanding of reality	20.09	2.821	0.786
Visioning		20.59	2.781	0.753
Inspiration		21.31	2.792	0.801
Harmonisation	Relationship with others	20.98	2.808	0.758
Accompaniment		20.84	2.988	0.792
Commitment		21.83	2.474	0.759
Resilience	Dedication to the task	20.34	3.323	0.836
Self-mastery		15.05	4.555	0.812

As can be observed in **Table 3**, the means of the different competencies show a certain stability and similar averages, except for the self-mastery competence, which has a significantly lower mean and a higher standard deviation. The reliability obtained for LID as a whole was 0.932. The Understanding of reality domain obtained a Cronbach's alpha of 0.891; Relationship with others obtained 0.903 and Dedication to the task obtained 0.770. It is noteworthy that the means of all the competencies have values between 20.09 and 21.83, except for self-mastery with a mean of 15.05.

4.2. Differences in the means

In Study 1, an analysis was made of the difference in means between Mexican and Spanish students. **Table 4** shows a summary of the means, standard deviations, and differences in means calculated by Student's t and the corresponding effect size measured by Cohen's d, with a p-significance of less than 0.001.

It can be seen that in both countries, the lowest rated competencies are resilience and, above all, self-mastery which confirm results of study 1. These competencies belong to the domain of Dedication to the task. The domains of Understanding of reality and Relationship with others are rated higher in both countries, with slight differences in the ranking of the means in favor of Relating to others with respect to Understanding of reality. On the other hand, when the means are compared between countries, the Mexican sample has a higher score than the Spanish sample in almost

all competencies. This result suggests that further research should be conducted in order to clarify whether the observed difference is due to an objective difference in the exercise of leadership or to a self-perception bias.

Table 4. Mean differences in LID competencies by country (Study 1).

Competencies	Mexican sample			Spanish sample			Mean difference	d de Cohen
	Subjects	Mean	SD	Subjects	Mean	SD		
Insight	485	21.27	3.50	328	19.80	2.80	Different	0.452
Deliberation	485	21.28	3.50	328	20.03	2.86	Different	0.382
Visioning	485	20.79	3.61	328	19.61	2.90	Different	0.352
Inspiration	187	21.24	2.66	247	19.36	2.57	Different	0.931
Harmonisation	187	21.72	2.85	247	19.61	2.88	Different	0.909
Accompaniment	187	21.44	2.95	247	19.54	2.74	Different	0.859
Commitment	270	21.70	2.37	242	20.26	2.97	Different	0.717
Resilience	270	20.14	2.83	242	18.94	3.00	Different	0.584
Self-mastery	270	15.82	3.95	242	15.80	3.60	Equal	-

4.3. Factor structure of LID

The analysis of the LID factor structure was conducted in two different studies. In the first study, an exploratory factor analysis was conducted, and subsequently carried out a confirmatory factor analysis for each domain. In Study 2, a confirmatory factor analysis was conducted on the instrument as a whole. **Table 5** shows the parameters obtained in the factor analysis (Study 1) for each of the three domains.

Table 5. Parameters factor analysis of LID domains (Study 1).

Construct validation parameters of the LID questionnaire				
Parameter	Criterion	Understanding of reality	Relationship with others	Dedication to the task
N		813	434	512
KMO	>0.5	0.972	0.945	0.843
Bartlett Sphericity	<0.05	0.0001	0.0001	0.0001
CMIN/DF	<5	3.22	2.759	2.777
RMSEA	<0.08	0.052	0.064	0.059
Goodness of fit index	0.9–1	0.955	0.931	0.937

As can be seen, the results confirm that the factorial structure of the scale can be revised with the data obtained, KMO > 0.8 in the three areas, and the grouping of items by the proposed factor achieves an adequate fit, GF > 0.9 in the three areas.

The parameters obtained in the confirmatory factor analysis (Study 2) are presented in **Table 6**, and the reliability coefficients in **Table 7**. The results confirm that the LID questionnaire fits well with a third-order model that measures leadership based on the three domains: CMIN = 4.192 and RMSEA = 0.041. The fit parameters are robust. However, the self-mastery scale (with a negative formulation that can affect the comprehension of the item) needs to be revised to improve its reliability and its consistency with the other competencies and domains of the model.

Table 6. LID parameters obtained from confirmatory factor analysis.

	X^2	gl	CFI	TLI	RMSEA
LID	3911.17	933	0.912	0.906	0.041
Understanding of reality	579	87	0.947	0.936	0.0545
Relation with others	922	87	0.921	0.905	0.0710
Dedication to the task	670	87	0.939	0.926	0.0593

Table 7. Reliability coefficients.

Reliability coefficients	Measurement Model												
	First order										Second order		Third order
	IT	DE	VI	IS	HA	AC	CO	RE	SM	UR	RO	DT	LID
α Cronbach	0.76	0.79	0.75	0.80	0.76	0.79	0.76	0.84	0.81	-	-	-	-
ω Mc'Donald	0.73	0.78	0.76	0.81	0.77	0.78	0.76	0.83	0.82	0.94	0.95	0.69	0.97

IT: Insight; DE: Deliberation; VI: Visioning; IS: Inspiration; HA: Harmonisation; AC: Accompaniment; CO: Commitment; RE: Resilience; SM: Self-Mastery; UR: Understanding of reality; RO: Relation with others; DT Dedication to the task.

4.4. Convergent validity of LID and SRLS questionnaires

The result of measuring the correlation between the two scales by calculating Pearson's coefficient was 0.818 with a significance <0.01. The internal consistency of the SRLS (Cronbach's alpha) was 0.926. In order to present the results of the two scales, since they have different numbers of items, the means were adjusted to a base of 100. **Table 8** shows the results of the means and standard deviations.

Table 8. Means and standard deviations of LID and SRLS.

Sample	N	LID			SRLS		
		Mean	SD	Adjusted mean	Mean	SD	Adjusted mean
Total	171	190.3	20.889	84.58	151.68	15.765	89.22
Women	114	191.25	16.783	85	152.59	11.215	89.8
Men	57	191.46	14.799	85.1	152.33	12.335	89.6

Table 9. Correlation coefficients between the domains of the LID scale and the dimensions of the SRLS scale.

SRLS dimensions	LID domains		
	Understanding of reality	Relationship with others	Dedication to the task
Consciousness of Self	0.644*	0.570*	0.550*
Congruence	0.640*	0.567*	0.496*
Commitment	0.689*	0.640*	0.587*
Collaboration	0.692*	0.746*	0.575*
Controversy With Civility	0.685*	0.684*	0.531*
Citizenship	0.635*	0.677*	0.506*

* Correlation is significative ($p < 0.01$).

The correlation result of the two scales as a whole (0.818) is complemented (**Table 9**) by measuring the correlation between the dimensions of the SRLS scale and the three domains of the LID scale.

It is important to highlight the correlation between "Relationship with others" domain and "Collaboration", of the SRLS scale, which is 0.746. This high convergence confirms the relevance of interpersonal relationships within the leadership construct. It is also important to note that there are high correlations >0.5 between the dimensions/domains of both questionnaires, except for "Congruence" and "Dedication to the task", which is lower (0.496). The results support the validity of the LID scale for assessing student leadership.

The correlation coefficients of the SRLS scale with the competencies from the three disaggregated domains of the LID scale are shown in **Table 10**.

Table 10. Correlation coefficients between the competencies of the LID scale and the dimensions of the SRLS scale.

SRLS dimensions	LID competencies								
	Insight	**Delibe-ration**	**Visioning**	**Inspiration**	**Harmonisation**	**Accompaniment**	**Commitment**	**Resilience**	**Self-mastery**
Consciousness of Self	0.551*	0.579*	0.577*	0.543*	0.520*	0.486*	0.555*	0.555*	0.169*
Congruence	0.502*	0.623*	0.564*	0.589*	0.494*	0.461*	0.625*	0.391*	0.156*
Commitment	0.518*	0.690*	0.619*	0.657*	0.598*	0.490*	0.667*	0.411*	0.260*
Collaboration	0.586*	0.596*	0.648*	0.727*	0.672*	0.632*	0.669*	0.433*	0.230*
Controversy With Civility	0.563*	0.637*	0.615*	0.655*	0.599*	0.604*	0.627*	0.489*	0.143*
Citizenship	0.502*	0.538*	0.645*	0.663*	0.581*	0.598*	0.605*	0.400*	0.182*

*Correlation is significative ($p < 0.01$).

These results confirm the convergence of the scales for measuring leadership. Of note is the high correlation between collaboration and inspiration (0.727), which suggests the relevance of an affective element in working with others. The high correlation between congruence and commitment suggests the relevance of personal coherence in the task commitment competency. It is also noteworthy that the self-mastery scale, with lower correlations, seems to imply that it is a construct not included in the SRLS scale but included by the LID scale.

5. Discussion

Both the domains and the competencies of LID show good reliability, with a Cronbach's alpha that varies between 0.76 (in Insight) and 0.93 (in Resilience), as can be seen in **Table 3**. Thus, consistent and reliable subscales are available to measure each of the competencies within each of the three domains. On the other hand, the reliability measure of the LID questionnaire as a whole is high, as was observed when it was used in Study 2 (0.932).

The means are similar for all competencies except for self-mastery, which is significantly lower. These data may indicate that students perceive themselves as particularly in need of education in this competence. On the other hand, research on self-perceptions of competencies or virtues similar to self-mastery (e.g., VIA) also indicates lower ratings than other character strengths (Peterson and Seligman, 2004; Park et al., 2012).

The results of Study 1 (see **Table 4**) show differences in students' scores by

country. Mexican students perceive higher levels of performance than Spanish students. With the exception of the self-mastery subscale, all mean differences between Mexican and Spanish students are significant and the effect size (Cohen's d) is medium or high. The means between Mexican and Spanish students are especially different for the Inspiration and Harmonization scales, with very high effect sizes. This result is congruent with Dugan's (2006) finding when comparing (using SRLS) the results of Mexican and American students. Culture (national and organizational) could explain this difference. The cultural context of the student, as well as the institution, influences the development of each leadership competence and, therefore, it will be necessary to adapt leadership didactics to different cultural and institutional conditions.

Similarly, students in both Spain and Mexico scored highest in the areas of Understanding of reality and Relationship with others, while they ranked third in the area of Dedication to the task. This research finding is consistent with the findings of Seligman's collaborators on the cross-cultural applications of the VIA (Park et al., 2012). Specifically, that there is a similar ranking of means across countries, indicating a common condition or human nature beyond the influence of country, without denying that leadership is highly culturally dependent (House et al., 2004; Iwowo et al., 2023). Cross-cultural studies of well-being and happiness also point in the same direction (Veenhoven, 2012).

The results of the confirmatory factor analyses (shown in **Table 6**), with the construct validation parameters of the LID questionnaire for each of the three domains or scales, indicate an adequate factorial structure that corresponds to the theoretical model. The fit of the empirical data to the proposed model is very good. The three scales present goodness of fit indices above 0.9, which allows us to be confident that the developed instrument validly measures the construct of integrated leadership in three domains: Understanding of reality, relationship with others, and Dedication to the task.

The correlation obtained between the two scales (LID and SRLS) is 0.818, with a significance <0.01, so we can affirm that the LID scale is convergent with the SRLS scale for measuring leadership. This is consistent with the theory that responsible leadership is similar to virtuous leadership (Cameron, 2011). The result shows the high covariation between the measurement of leadership by the LID scale and that obtained by the SRLS scale. Particularly relevant is the correlation (0.746) between the "collaboration" dimension of the SRLS and the "Relationship with others" domain of the LID, suggesting that both scales measure a similar aspect of leadership. On the other hand, it can also be observed that the lowest correlations are found with the "Dedication to the task" domain (especially "self-mastery"). One explanation is that the SRLS scale mainly measures interpersonal or relational aspects, and the LID model measures a variety of domains and not only the relational domain. The leadership model on which the SRLS is based seeks to enable people to work effectively and cooperatively with others (Tyree, 1998).

It is important to recognize the potential for bias and the limitations of Likert-type scales when used to measure leadership (Alvesson, 2020). The social desirability bias or the difficulty of adequate introspection affects students' self-perception, especially when it comes to measuring personal competencies related to virtues that

have an intentional and moral component. In a previous study, we considered these limitations and how to deal with them as rigorously as possible, taking into account recommended methodological considerations (López González et al., 2023).

It will be useful to triangulate the data with evidence obtained through performance tests, interviews, focus groups and observations. There are limitations due to the origin of the samples, coming from only two Spanish-speaking countries, and the fact that a convenience sampling method was used. The sampling method used and the validation in only two countries limit the generalization of the results and conclusions. In the future, the questionnaire should be applied to samples of students in other countries, in particular from different cultures and languages. Further studies should also be carried out to evaluate the stability of the questionnaire and the appropriateness of the instrument for assessing student leadership development over time, through longitudinal studies with control groups.

Leader character is key to leadership excellence. It is planned to use LID to character education using accommodation learning strategies of crucible experiences (Byrne et al., 2018), and to measure the impact of educational interventions such as extracurricular leadership education programs (longer than one year) and even the impact of courses linked to leadership education. Students participating in these programs or courses would receive a personal report that would allow them to identify their self-perception on the development of their leadership virtues and competencies. This report can be used to develop a personal leadership development plan. Finally, it would be convenient to continue with the convergent and incremental validation of the questionnaire, studying its relationship with other questionnaires such as the VIA (on virtues and character strengths) and the ALQ (on authentic leadership questionnaire).

6. Conclusion

This research provides a questionnaire suitable for assessment of education in leadership competencies and virtues in university students. The LID questionnaire is a psychometrically reliable questionnaire with construct and convergent validity, grounded on an Aristotelian-Thomistic virtue-based leadership model. The theoretical and factorial structure of LID has three domains: intellectual, relational and performative. It is a questionnaire with a solid theoretical foundation that aims to provide a non-simplistic way of understanding and training leadership, thus responding to the criticism of some models of leadership based on ethical values (Alvesson and Einola, 2019).

Further studies should be carried out with the LID questionnaire to determine its validity in different cultural contexts: the results obtained indicate that there are differences between countries, although the same ranking order of averages is maintained. Furthermore, convergent and incremental validity studies should be carried out with other leadership instruments to determine the degree of affinity with other models. LID should also be used in longitudinal studies with control groups. Likewise, the wording of the items that make up the self-control scale should be revised to improve its consistency with the rest of the model.

Finally, LID should be used to measure the effect of educational interventions

and the didactics used to teach leadership. LID can contribute to assessing whether extracurricular courses or programs have an impact on students' leadership development. In this way we can assess whether universities are fulfilling their educational mission as publicly presented. This is the path we intend to follow in future studies.

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Appendix: LID questionnaire applied (in Spanish)

Ámbito	Eje Educable	nº	Ítem
Compren-sión de la realidad	Mirada	1	Respecto a las situaciones que me rodean: Identifico el bien que es posible realizar
		2	Respecto a las situaciones que me rodean: Identifico las oportunidades de crecimiento y desarrollo
		3	Respecto a las situaciones que me rodean: Descubro el significado profundo de los acontecimientos
		4	Cuando me enfrento a un problema relevante: Tengo apertura a nuevas ideas que cuestionan mis supuestos
		5	Cuando observo lo que sucede a mi alrededor: Busco semejanzas y diferencias antes las diversas manifestaciones de la realidad
	Deliberación	6	Cuando tomo una decisión: Analizo las distintas alternativas de solución
		7	Cuando tomo una decisión: Elijo los medios más adecuados para lograr el objetivo
		8	Cuando tomo una decisión: Comunico, de manera clara y oportuna, lo que hay que hacer
		9	Cuando voy a realizar una acción: Genero los recursos necesarios para lograr el objetivo
		10	Cuando voy a realizar una acción: Visualizo las dificultades que pueden presentarse y me siento capaz de adelantar soluciones
	Visión de cambio	11	Cuando imagino un futuro deseable: Valoro la urgencia de los cambios que se necesitan
		12	Cuando planifico una nueva actividad: Integro y priorizo diversas alternativas de acción
		13	Cuando planifico una nueva actividad: Ordeno las ideas y los recursos que son necesarios para actuar
		14	Cuando aparecen situaciones inesperadas: Estímulo a que surjan nuevas iniciativas de acción
		15	Cuando aparecen situaciones inesperadas: Acepto que son parte del proceso de gestionar el cambio
Relación con otros	Inspiración	16	Trato de que las acciones a corto plazo estén inspiradas por la visión de futuro del grupo
		17	Tengo presente en mi trabajo la visión de futuro y propósito del grupo
		18	Me esfuerzo por hacer realidad la visión de futuro del grupo
		19	Busco que quienes trabajan conmigo se mantengan motivados al realizar las tareas
		20	Genero optimismo y compromiso en los demás en torno al propósito del grupo
	Armonización	21	Preveo medidas para resolver oportunamente los conflictos
		22	Doy facilidades para que los miembros del equipo resuelvan los conflictos
		23	Les muestro que se pueden aprovechar oportunidades que parecen estar perdidas
		24	Me preocupo de que mi equipo asuma el rol que le corresponde
		25	Me aseguro de que mi equipo cumpla las expectativas
	Acompañamiento	26	Trato de ofrecer a mis colaboradores elementos para mejorar su modo de relacionarse con los demás
		27	Me interesa que quienes trabajan conmigo desarrollen motivaciones éticas en su labor
		28	Ayudo a que quienes trabajan conmigo aprendan a establecer objetivos.
		29	Colaboro con los demás para encontrar juntos la mejor solución
		30	Me acerco a mis colaboradores cuando percibo que tienen dificultades en su relación con otros

Ámbito	Eje Educable	nº	Ítem
Dedicación a la tarea	Compromiso	31	Oriento mis acciones en equipo y hacia objetivos futuros, aunque no obtenga resultados inmediatos
		32	Me esfuerzo por hacer lo mejor posible las responsabilidades que me toca realizar
		33	Para mí, es importante trabajar hoy, pensando en el futuro de las personas de las que me siento responsable
		34	Me motiva pensar en el bien que puedo alcanzar trabajando con otras personas que comparten mi ideal
		35	Confío en que algunas tareas que hago por mi comunidad darán su fruto más adelante
	Resiliencia	36	Cuando enfrento situaciones que implican reto o riesgo, soy capaz de adaptarme y modificar mis planes iniciales
		37	Cuando se me presentan situaciones que tienen mucha incertidumbre, soy capaz de reconocerlas y no paralizarme
		38	Asumo mis temores de modo que no me paralizan
		39	Soy bastante capaz de enfrentar retos o situaciones que no me son favorables
		40	Si algo inesperado o traumático me sucede, me doy cuenta de que soy capaz de aceptarlo, y volver a actuar con presencia y determinación
	Autodominio	41	Me desanimo cuando mis fallos salen a relucir ante los demás
		42	Me conformo con cumplir los mínimos exigidos en las tareas de equipo encomendadas
		43	Pierdo tiempo en cuestiones que me agradan, aunque no ayuden a los objetivos del equipo
		44	Me cuesta sacrificar tiempo de ocio en beneficio de los demás
		45	Me cuesta "saber esperar" en los proyectos comunitarios cuando no obtengo respuestas inmediatas