

# The QELtLCUS questionnaire. An instrument for evaluating the learning to learn competence in university students

*El cuestionario CECAPEU. Un instrumento para evaluar la competencia aprender a aprender en estudiantes universitarios*

Gargallo-López, Bernardo , Suárez-Rodríguez, Jesús M. , Pérez-Pérez, Cruz ,  
Almerich-Cerveró, Gonzalo , & Garcia-Garcia, Fran J.

University of Valencia (Spain)

## Abstract

Learning to learn is one of the key competences identified by the European Commission (EC, 2005 and 2006) for education systems. Rigorous evaluation instruments are necessary for this competence to be included in curriculum design and teaching-learning processes. Currently available questionnaires are limited and so the present work focuses on the design and validation of a standardised quantitative questionnaire to evaluate the way in which university students manage this competence. A test validation design was employed with a sample of 1237 university students from three universities in Valencia. Confirmatory factor analysis revealed good internal consistency and construct validity outcomes. A final questionnaire was produced which addressed five dimensions/scales (cognitive, metacognitive, affective-motivational, social-relational and ethical) through twenty-one subdimensions/subscales composed of 85 items. This questionnaire was found to be more robust and comprehensive than those that were previously available. The instrument will help to advance knowledge in this area. It is useful for researchers as it can be used for diagnosing and evaluating the competence in question, whilst also comparing results obtained in large population samples.

**Keywords:** Learning to learn competence; Assessment; University students; Self-regulated learning.

## Resumen

La competencia “aprender a aprender” es una competencia clave que la Comisión Europea (CE, 2006 y 2018) fijó para los sistemas educativos. Para su incorporación al diseño curricular y a los procesos de enseñanza-aprendizaje es ineludible disponer de instrumentos de evaluación rigurosos. Este trabajo se centra en el diseño y validación de un cuestionario cuantitativo estandarizado para evaluar su adquisición en estudiantes universitarios, dadas las limitaciones de los actualmente disponibles. Para ello se hizo uso de un diseño de validación de pruebas. Se utilizó una muestra de 1237 alumnos universitarios de tres universidades valencianas. Los resultados de consistencia interna y validez de constructo, mediante análisis factorial confirmatorio, fueron buenos. El producto final es un cuestionario con cinco dimensiones/escalas (cognitiva, metacognitiva, afectivo-motivacional, social-relacional y ética), veintiuna subdimensiones/subescalas y 85 ítems, más sólido y completo que los anteriormente disponibles. Es un instrumento que permite el avance del conocimiento en este ámbito y que será útil para los investigadores, sirviendo para el diagnóstico y evaluación de la competencia y para contrastar resultados en muestras amplias de población.

**Palabras clave:** Competencia aprender a aprender; Evaluación; Estudiantes universitarios; Aprendizaje autorregulado.

Received/Recibido

2021 march 05

Approved /Aprobado 2021 june 14

Published/Publicado

2021 june 27

The learning to learn construct (LtL) has been debated in academic literature since the 1980s. Literature on strategic learning (Weinstein, 1988), based on cognitive psychology/information processing theory, and literature on self-regulated learning (Pintrich, 2004; Zimmerman, Schunk, & DiBenedetto, 2017), based on socio-cognitive theory (Caena, 2019; Panadero, 2017), have both urged its importance. Over time these two lines have converged (Weinstein & Acee, 2018) to combine the concept of strategic learning with that of the self-regulated learner. However, although the term learning to learn is commonly used in the literature, discussion around the “learning to learn competence” did not begin until the European Commission released its statements on the topic.

The Commission included LtL as a key competence for education systems in member states (EC, 2006). This competence includes motivation, confidence and the ability to persist when it comes to learning, organisation, time management and use of learning skills. It also encapsulates awareness of one’s own learning process and the ability to overcome difficulties, working well in a group, and applying what is learnt in one’s private and professional life.

In 2018, the Commission reformulated this skill and renamed it as a *personal, social and learning competence* (EC, 2018). This led to the addition of important personal and social elements to the previous proposal, including, conflict resolution, empathy, stress management, resilience, positive attitudes towards personal and social well-being, lifelong learning, integrity, etc.

Effective acquisition of this competence is vital for enabling individuals to adapt to changes to the knowledge society (Säfström, 2018), confront employability challenges, and for personal and social development. In higher education in particular, students are expected to work in an autonomous and self-regulated way (Almerich et al., 2018; Lluch Molins & Portillo Vidiella, 2018; Fraile et al., 2020). It may be assumed by some that university students undertaking higher education will have an effective grasp of this competence, however,

this is not supported by the available data (Viejo & Ortega-Ruiz, 2018; Zhu & Schumacher, 2016).

The aforementioned context reveals the importance of the present research [“Operational design of the ‘learning to learn’ competence for university degrees, Assessment instruments and proposals for teaching”. Research funded by Spain’s Ministry of the Economy, Industry, and Competitiveness. Code EDU2017-83284-R.]. Issues around this competence are complex and there is insufficient clarity about the construct, the way in which it should be evaluated and how it should be developed at university. All of these issues are of great interest. Thus, the present paper considers fundamental theoretical issues such as how to teach and evaluate this competence. The *aim* of the present work is to establish the construct validity of a questionnaire developed to evaluate this competence. This aim will be addressed through the following *specific objectives*:

1. Establish the reliability of the questionnaire in relation to its dimensions and subdimensions
2. Establish the evidence in accordance with the internal structure of the questionnaire

### ***The LtL competence model***

A model developed by the present research team was used to provide the foundation for construction of the questionnaire. Relevant development processes are described by Gargallo et al. (2020). The aim was to develop a rigorous and comprehensive model that was capable of bringing together the different dimensions of this competence for application at any educational stage.

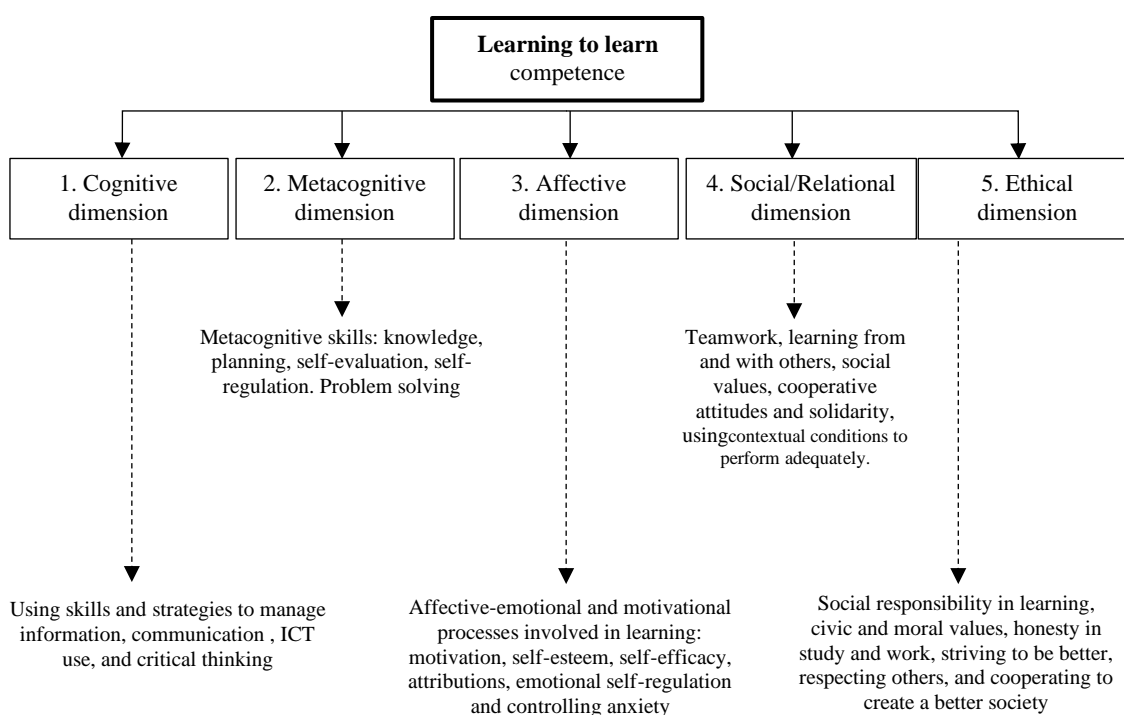
Once the model had been constructed, it was evaluated by six experts in learning. All experts were university teachers and researchers. The experts evaluated the suitability of the LtL definition developed by the research team. They also evaluated the extent to which each of the proposed dimensions and their descriptions represented the competence, whilst considering the fundamental elements that make it up. Finally, they evaluated the extent to which each

of the competence's subdimensions, as formulated by the researchers, were important elements representing the areas covered by the five dimensions and the extent to which they covered the fundamental elements of each dimension. Based on this evaluation, necessary modifications were made to the model. These took the following form:

Figure 1 presents the five dimensions and their descriptions, whilst Figure 2 shows the 20

subdimensions established. The first three dimensions (cognitive, metacognitive and affective-motivational) were derived from theories of strategic learning and self-regulated learning as these underpin the formulation of this competence. The fourth dimension, which was social-relational, was derived from a sociocultural/constructivist approach (Caena, 2019) and considered the importance of learning alongside other individuals.

Figure 1. Dimensions of the LtL competence



Further, a fifth dimension – ethical – was added to the present model which is not included by previously developed models. A competent learner cannot disregard the ethical components involved in learning, whether those related to ethics in the learning process or those related to ethics in the process of using what has been learnt to improve oneself and others.

***Evaluating the LtL competence and existing research***

Good curriculum design cannot be achieved without comprehensive evaluation procedures and tools.

An often-faced problem when striving to do this relates to the complexity of the construct. LtL is a metacompetence which includes competences that are, in themselves, complex. These include problem solving, managing information and team work. Addressing this requires an integrated approach which uses a variety of quantitative and qualitative evaluation instruments to establish whether these competences have been acquired. Competences are displayed through learning outcomes, which can be assessed using the tasks used to achieve them. An eminently ecological focus on authentic teaching and evaluation tasks appears to be appropriate for

the day-to-day work of teachers. This focus uses the aligned approach (constructive alignment) (Ruge et al., 2019) proposed by Biggs (2005) in which competences, learning outcomes, teaching procedures and evaluation occur in concert so that students achieve in-depth learning. This allows for a highly functional approach to the topic of teaching/evaluation which facilitates teachers in their work and makes it possible to use the assignments and methods employed when teaching the competence (cooperative work, individual work, projects, public presentations, debates, solving problems, case studies, etc.) as evaluation procedures. This is done by using systematic recording instruments (observational records, rubrics, semantic differential scales, etc.), evaluations of student outputs (portfolios, individual and group work) and metacognitive questions to inspire students to reflect on the process they have followed when learning, etc.

Nonetheless, a standardised instrument capable of obtaining the relevant data is also needed to complement data collected through other procedures. Such an instrument would make it possible to evaluate competence attainment and could be used for the diagnosis and assessment of potential training programmes. It could also be useful for obtaining population data which could then be examined in descriptive/comparative, explanatory, predictive, etc. studies.

Related research has already been conducted in Spain and elsewhere in Europe. Of the Spanish studies, work carried out by Jornet Meliá et al. (2012) to identify a methodological proposal for the implementation of LtL evaluations is of particular relevance.

One of the authors of that work, García Bellido (2015), developed and validated an evaluation instrument in her doctoral thesis. The problem is that this questionnaire focuses exclusively on evaluating LtL in education professionals. In this sense, the author establishes three dimensions/sub competences that must be evaluated: Understanding of disciplinary academic language; knowledge and use of resources for professional

development, and; attitudes towards professional development and improvement. The questionnaire was carefully developed, requiring certain tasks to be completed in order to evaluate the competence. Despite this, it has one basic drawback which is that it does not sufficiently justify the reason for which these three particular dimensions comprise the competence.

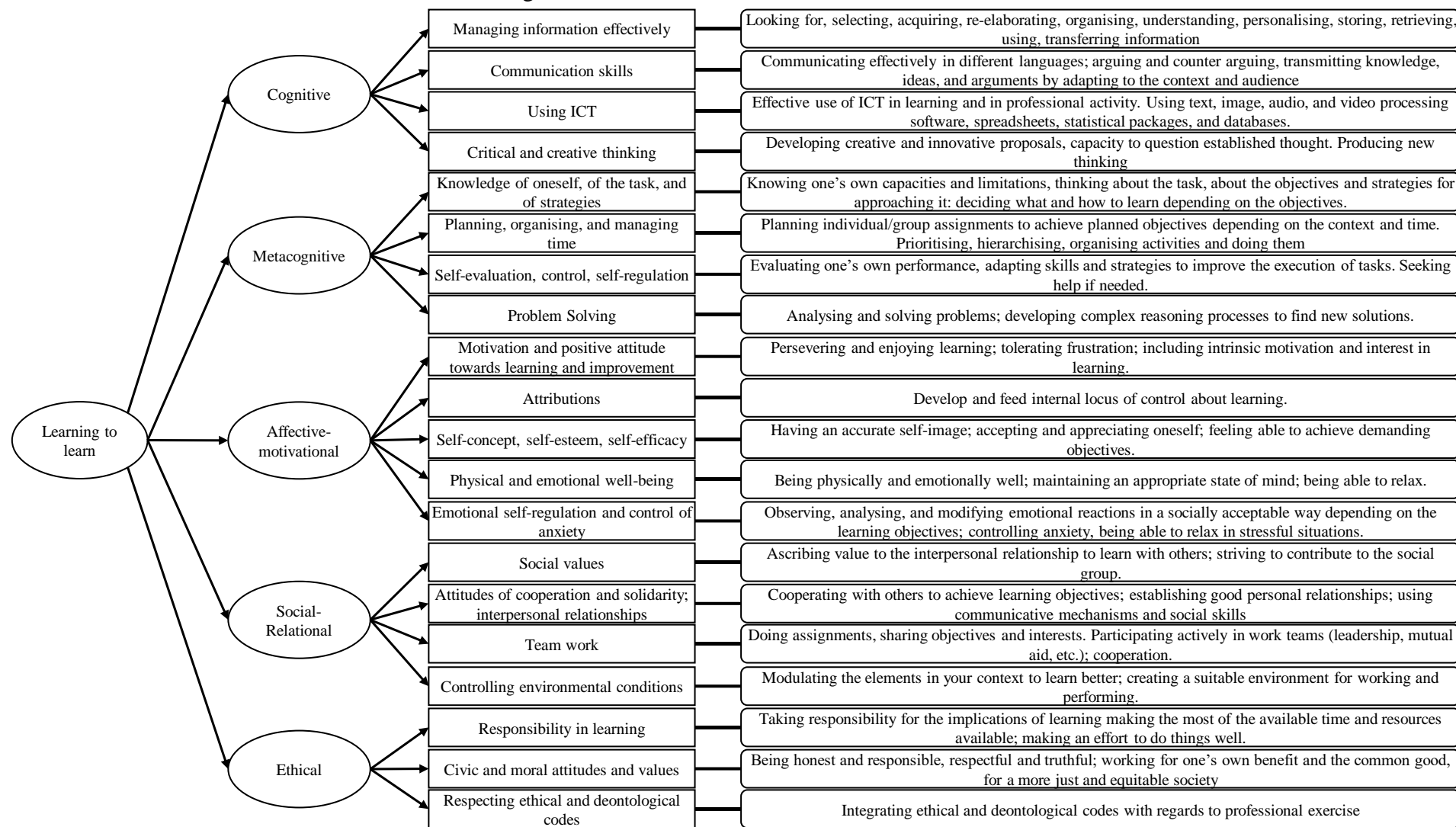
Two Spanish studies have designed standardised instruments for a university student population.

In the first, Villardón-Gallego et al. (2013) designed a questionnaire with 18 items integrated into four dimensions – self-management of learning, knowledge construction, self-knowledge as a learner, and transfer of knowledge – to evaluate this competence in university students. A rigorous validation process was conducted, including confirmatory factor analysis and good statistical indicators. Nevertheless, the authors' consideration of the competence was limited and it is difficult to perform a good diagnosis with such a short questionnaire. In other words, too many relevant variables were omitted (affective-motivational, social, etc.).

A similar process was followed in the second of these works performed by Muñoz-San Roque et al. (2016). These authors developed a questionnaire with 9 items organised into three dimensions: managing the learning process, self-evaluation of the process, and self-knowledge as a learner. In this case, too many fundamental variables to the LtL construct were again left out of the questionnaire.

A number of relevant studies have been conducted in Europe. As a part of the LEARN (Life as Learning) project developed by the University of Helsinki, Hautamäki et al. (2002) developed a well-founded evaluation instrument for primary- and secondary-school students. This instrument included three components (beliefs relating to context, beliefs relating to oneself and learning competences) and various dimensions.

Figure 2. Model dimensions and subdimensions





Another important piece of work comes from the European Commission’s CRELL network (Centre for Research on Education and Lifelong Learning). Hoskins and Fredriksson (2008) coordinated a group of experts from European countries to develop an instrument for evaluating this competence in EU states. Their work was based on previous work, such as that conducted by Hautamäki et al. (2002), Deakin Crick et al. (2013) (Effective Lifelong Learning Inventory), Elshout-Mohr et al. (2004) (Cross-Curricular Skills Test) and Moreno (2002) (Metacognition Evaluation Test).

They designed a test which included three dimensions – affective, cognitive and metacognitive – composed of various subdimensions. This test was designed for non-university students.

This test was then administered in eight European countries with broad samples of 14-year-old students. Unfortunately, obtained outcomes reflected a need for subsequent development of all three of the instrument’s dimensions.

In conclusion, a standard European instrument does not yet exist and there is

growing awareness of the need for more in-depth theoretical analyses and evaluations of this competence (Moreno et al., 2008).

Given that discussed above, we believe it is essential to design and validate an instrument for the evaluation of this competence in university students given that currently instruments are not sufficiently comprehensive to provide quality assessments.

## Method

### Design

We used a test validation design (Bandalos, 2018) which is described later in the procedure section.

### Participants

The sample comprised 1237 students from three universities in the city of Valencia. Of these, two were public universities, with 34.27% of the sample coming from the Universidad de Valencia Estudio General (UVEG) and 33.71% coming from the Universidad Politécnica de Valencia (UPV), and one was private, with 32.01% coming from the Universidad Católica de Valencia (UCV) (Table 1).

Table 1. Sample

	UVEG (Health Sciences)	UPV (Engineering)	UCV (Ed. Science)	Total
YEAR	<i>n</i>	<i>n</i>	<i>n</i>	
1st	105	115	124	344
2nd	101	128	79	308
3rd	135	85	102	322
4th	83	89	91	263
<b>Total</b>	<b>424</b>	<b>417</b>	<b>396</b>	<b>1237</b>

Purposive non-probability sampling was used with students being selected from one of the major knowledge areas at each university: Health Sciences (UVEG), Engineering and Architecture (UPV), and Education (UCV). The intention of this was to achieve a sufficiently varied and representative sample of different major areas/fields of knowledge from each of the participating universities. Given the fact that the present research group has been working closely on these areas at the three universities on different research

projects, it was possible recruit a sufficient number of participants from these universities. The anticipated sample was 1500 participants, with responses eventually being received from 1370. Participants were eliminated if they did not respond to all of the items, leaving a final sample of 1237. Of these, 344 were first-year students (27.80%), 308 second-year (24.89%), 322 third-year (26.03%) and 263 fourth-year (21.26%). 391 were male (31.60%) and 843 were female (68.14%). Health Sciences (UVEG) students came from three faculties

and three programmes, whilst Educational Sciences (UCV) students came from one faculty and four programmes, and students undertaking Engineering and Architecture and other polytechnic programmes (UPV) came from nine faculties and twenty-one programmes.

### **Procedure**

In order to design the questionnaire, the research team carried out a systematic review of existing publications on this competence. Special attention was given to evaluations and the instruments described in the literature. On the basis of this work, the team developed a theoretical model with the aim that this would be comprehensive and integrated. The questionnaire structure was designed on the basis of the theoretical model (Figure 2). The research team designed items for each subdimension, producing a total of 226.

In order to examine content validity of the questionnaire, it was subjected to analysis and evaluation by seven experts in research methodology, evaluation and learning (Bandalos, 2018). All experts were university academics. Experts were provided with a document presenting the definition of the competence developed by the research team and the structure of the theoretical construct on which the questionnaire was based. This document also included a list of the items pertaining to each of the competence's subdimensions and dimensions. Based on this, experts evaluated content validity of the items and their belonging to each dimension. Intelligibility, lack of ambiguity and location were also evaluated on a 5-point scale.

Items with a mean score below 4 points were rejected. This led to a reduction of the number of items from 226 to 210. Items for which discrepancies emerged in the experts' evaluations (Kendall's coefficient of concordance) were also removed, further reducing the number of items from 210 to 198.

Prior to administration of the questionnaire to participating students, intelligibility of the items was examined with a group of pedagogy students at the Universidad de Valencia.

Modification were then made to the wording of some items.

With the questionnaire reduced to 198 items, participating students completed the instrument using an on-line application during a lecture. Informed consent was provided prior to questionnaire completion. Participation was voluntary and, whilst students did provide demographic data when completing the questionnaire, no data was provided that could be used to identify individuals. The research ethics committee of the UVEG was consulted and confirmed that authorisation was not needed for the study.

Subsequent analysis of individual items led to selection of the most appropriate items for each of dimension and subdimension of the questionnaire (Abad et al., 2011). This led to a final reduction with the final questionnaire consisting of 85 items.

### **Data analysis**

Confirmatory factor analysis (CFA) was performed using the *lavaan* program (Rosseel, 2012) given that the theoretical model set out to confirm and clarify the pertinent items for each of the questionnaire's subdimensions/dimensions (Lloret-Segura et al., 2014). Validation estimations regarding the dimensionality of the scale were performed using the diagonally weighted least squares (DWLS) method as this was appropriate with regards to the measurement type pertaining to the items and dimensions (Finney & DiStefano, 2013).

In order to evaluate model fit,  $\chi^2$  was used in consideration of the fact that this indicator is sensitive to sample size, and the number of indicators in the model and their interaction (Hair et al., 2010). Indeed, various authors (Hair et al., 2010; Kline, 2015) have recommended the use of other indicators, alongside their acceptance thresholds, to evaluate fit. In the present case, RMSEA was used in accordance with a 90% confidence interval and significance level. This classifies items with values equal to or less than .05 as having good fit. Comparative fit indices (CFI) classified values equal to or greater than .95 as

having good fit and, finally, standardised root mean squared residuals (SRMR) classified values equal to or lower than .05 as having good fit and those between .05 and .08 as having acceptable fit (Hu & Bentler, 1999). McDonald's  $\omega$  (1999), Cronbach's alpha and stratified alpha coefficients ( $\alpha_{es}$ , Rajaratnam et al., 1965) were used to evaluate reliability of the dimensions.

## Results

Results are presented in two subsections. Firstly, validation of the five dimensions/scales pertaining to the LtL construct are discussed, following validation of the general structure of the construct, according to the five dimensions.

### Dimensional validation

Confirmatory factor analysis with a hierarchical model was used to validate each of the five dimensions/scales.

With regards to the *cognitive* dimension, a hierarchical model was proposed. Specifically, the first-level of the information management subdimension/subscale contains eight second-level subdimensions/subscales, whilst the

communication skills subdimension contains two second-level subdimensions/subscales (Figure 3). The other two subdimensions of the cognitive dimension are made up by ICT use, and critical and creative thinking.

Almost all of the indicators of the proposed model displayed good fit (Table 2). The  $\chi^2$  index was significant, however, this must be considered in light of the issues discussed above. RMSEA and CFI outcomes both suggested excellent fit. SRMR outcomes were close to the proposed threshold of .05 and below .08 in all cases (Hu & Bentler, 1999).

With regards to the measurement model (Figure 3), overall saturation was significant ( $p < .01$ ) and acceptable, with most individual saturations being greater than .50 (Hair et al., 2010). Exceptions are found for the loadings pertaining to three items – items 14, 18 and foreign language communication – although values were still above .40 which is acceptable (Bandalos & Finney, 2018). Loadings are, therefore, acceptable for all of the subdimensions and, where applicable, for the second-level subscales, as well as for the cognitive dimension.

Figure 3. Hierarchical model pertaining to the cognitive dimension

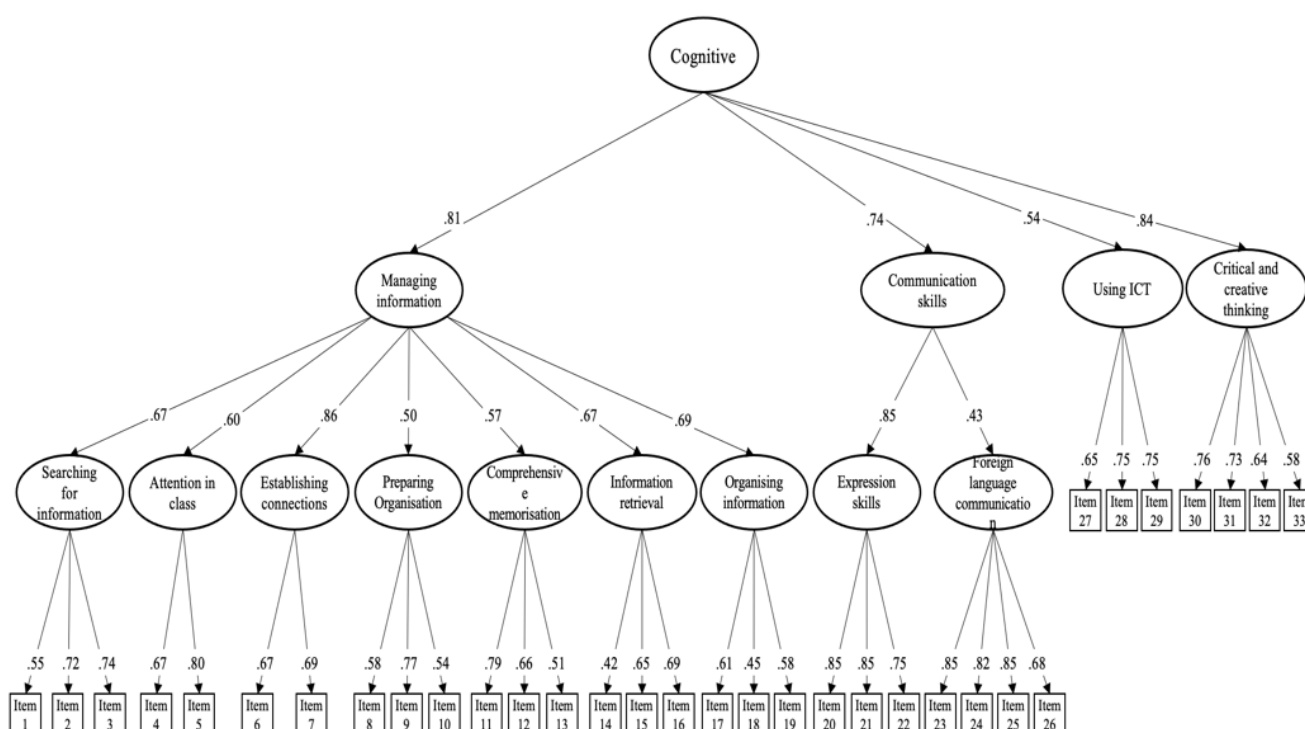




Table 2. Fit indicators pertaining to the learning to learn dimensions

Dimensions or scales	$\chi^2$			RMSEA				
	$\chi^2$	df	p	RMSEA	90% CI	Pclose	CFI	SRMR
Cognitive	1564.417	482	.000	.043	(.040–.045)	1.000	.954	.053
Metacognitive	63.122	50	.101	.015	(.000–.025)	1.000	.997	.030
Affective and motivational	288.564	98	.000	.040	(.034–.045)	.999	.966	.047
Social-relational	71.461	84	.833	.000	(.000–.010)	1.000	1.000	.032
Ethical	14.491	24	.935	.000	(.000–.006)	1.000	1.000	.023

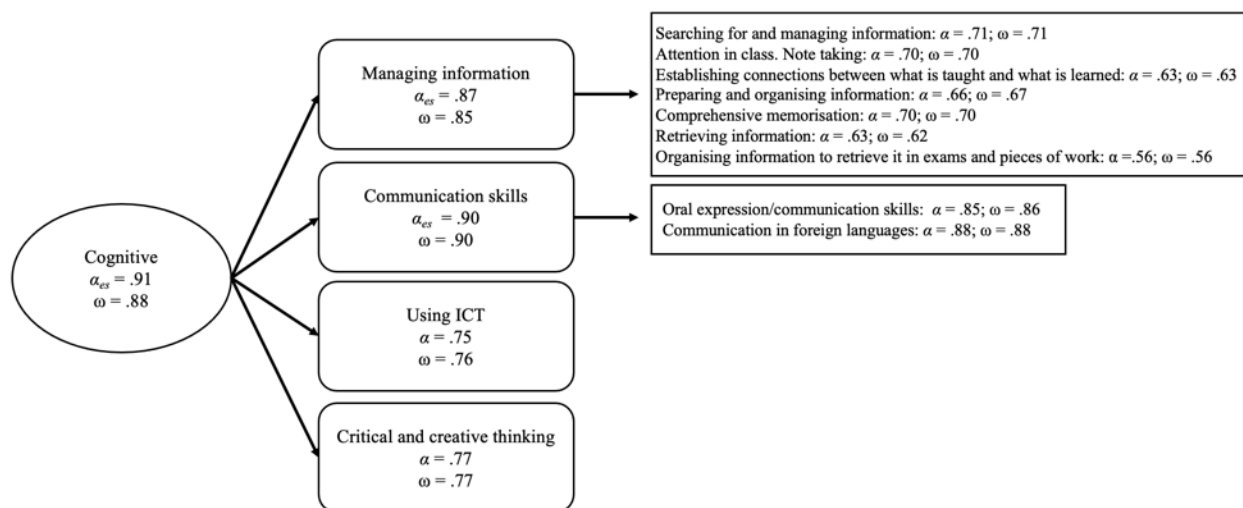
With regards to reliability estimations (Figure 4), Cronbach’s  $\alpha$  and McDonald’s  $\omega$  were equal to or greater than .70 in almost all of the first- and second-level subdimensions. Four exceptions to this are found in the managing information subdimension, although the values obtained were still acceptable (Hair et al., 2010). It should be noted that the values for these indices are very similar in all cases. This reflects the robustness of the scale. Reliability estimates for the managing information and communication skills subdimensions are excellent, as they for the cognitive dimension, with all indices being between .85 and .91. All of this reflects acceptable internal consistency in the proposed structure of the cognitive dimension.

Thus, the proposed measurement model was satisfactory and the designed items were found to adequately represent the hierarchical structure of the cognitive dimension.

The *metacognitive* dimension comprises four subdimensions: 1) knowledge of objectives, evaluation criteria and strategies 2) planning, organisation and management 3) self-evaluation, control and self-regulation, and 4) problem solving.

All indicators of the proposed model displayed excellent fit (Table 2). Obtained  $\chi^2$  indices were not significant, whilst indices for the other three indicators (RMSEA, CFI and SRMR) were all within established thresholds.

Figure 4. Reliability estimates pertaining to the cognitive dimension



With regards to the measurement model (Figure 5), overall model saturation was significant ( $p < .01$ ) and acceptable, with all individual values being greater than .50 (Hair et al., 2010). Similarly, loadings pertaining to

the subdimensions of three of the four dimensions (knowledge of objectives and criteria...; self-evaluation, control...; and problem solving) were acceptable. The loading of the planning, organisation... subdimension

was slightly below .50, although it was still acceptable (.48) (Bandalos & Finney, 2018). Factor loadings of the overall model were acceptable in relation to the proposed structure of the model.

Reliability estimates (Figure 6) pertaining to the knowledge of objectives... and planning, organisation... subdimensions are good, with both Cronbach's  $\alpha$  and McDonald's  $\omega$  being

above 0.70. With regards to the self-evaluation, control... and problem solving subdimensions, indices were acceptable (Hair et al., 2010). Stratified  $\alpha$  and McDonald's  $\omega$  indices were excellent. It should be noted that values for these indices were very similar in all cases. This reflects scale robustness. Thus, internal consistency of the proposed scale structure for the metacognitive dimension was acceptable.

Figure 5. Hierarchical model pertaining to the metacognitive dimension

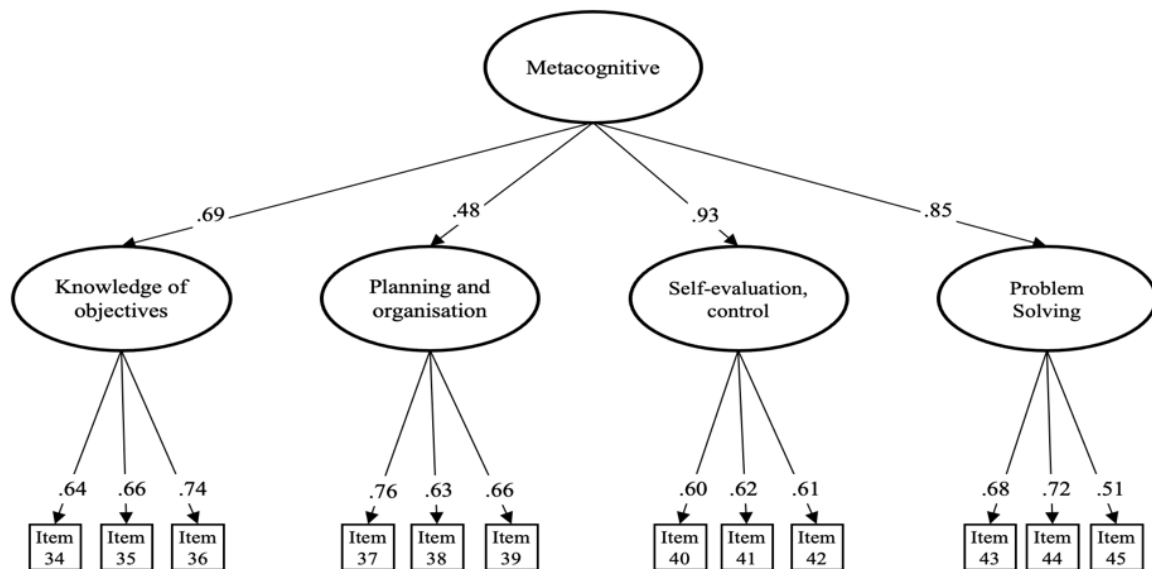
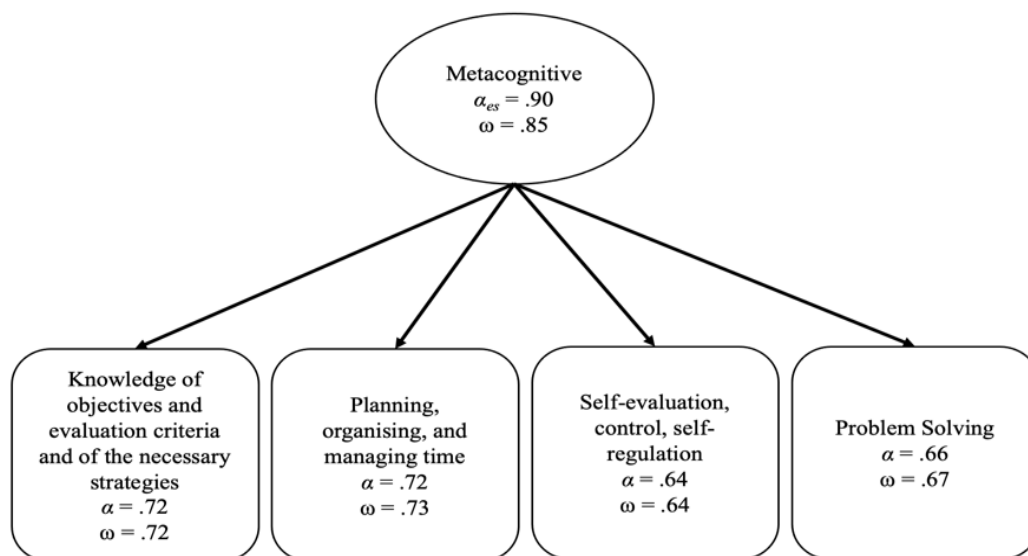


Figure 6. Reliability estimates for the metacognitive dimension



Consequently, the proposed measurement model was satisfactory and the developed items were found to adequately represent the hierarchical structure of the metacognitive dimension.

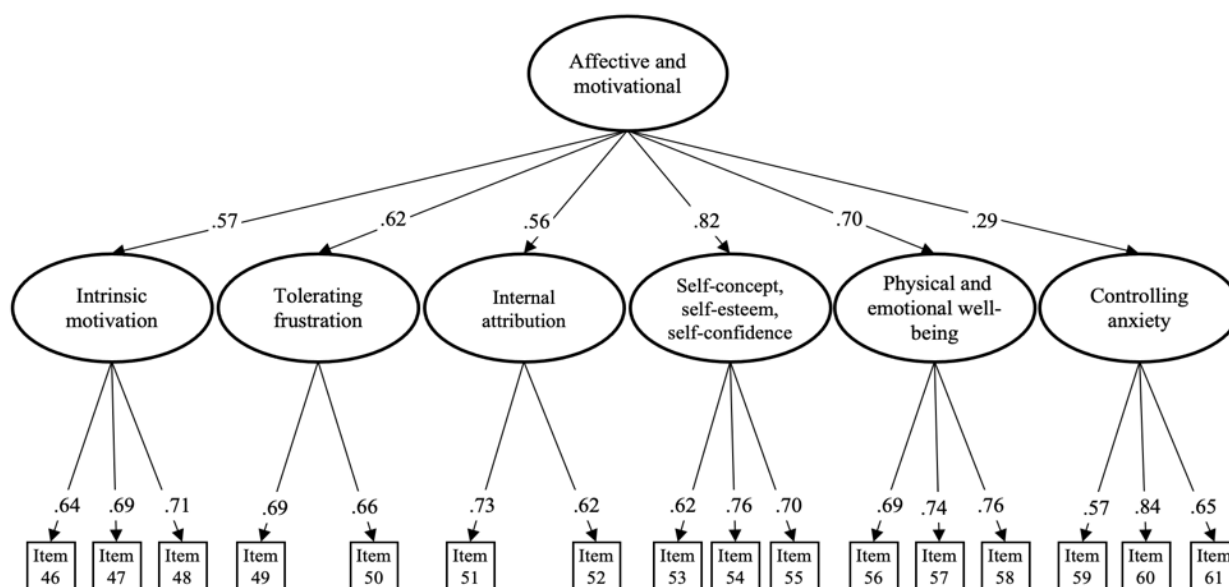
The *affective and motivational* dimension comprises six subdimensions: 1) intrinsic motivation 2) resilience/tolerating frustration 3) internal attributions 4) self-concept, self-esteem, self-efficacy 5) physical and emotional well-being, and 6) controlling anxiety.

Almost all indicators of the proposed model displayed excellent fit (Table 2). The obtained  $\chi^2$  index was significant, however, this should be interpreted in consideration of that mentioned above regarding the meaningfulness of this index. The other three

indicators (RMSEA, CFI and SRMR) displayed excellent fit in line with the cut-points presented above.

With regards to the measurement model (Figure 7), overall model saturation was significant ( $p < .01$ ) and acceptable, with individual saturations being greater than .50 (Hair et al., 2010). All loadings for the subdimensions are acceptable, being greater than .50. The only exception is seen for controlling anxiety, which has a weak loading (.29) although this was close to the threshold of .30. This loading can, therefore, also be regarded as acceptable (Bandalos & Finney, 2018). Overall, factor loadings were acceptable in relation to the planned model structure.

Figure 7. Hierarchical model pertaining to the affective and motivational dimension

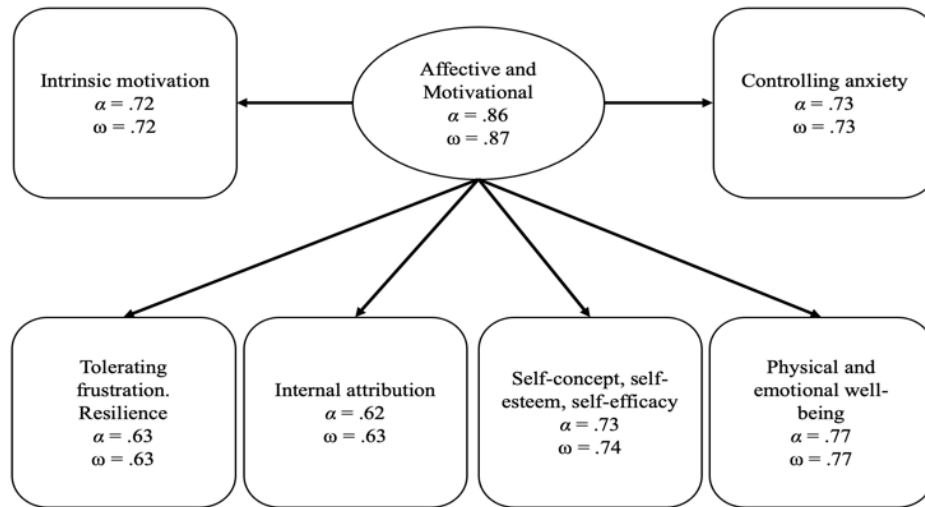


Reliability estimations (Figure 8) for the intrinsic motivation, self-concept, self-esteem and self-efficacy sub-dimensions in addition to the physical and emotional well-being, and controlling anxiety subdimensions were good. With Cronbach's  $\alpha$  and McDonald's  $\omega$  exceeding .70. With regards to the tolerating frustration and internal attributions subdimensions, indices were acceptable (Hair et al., 2010). Both indices were excellent for the affective and motivational dimensions.

Furthermore, values for these three indices were very similar in all cases, indicating scale robustness. Thus, internal consistency of the scale was acceptable for the proposed structure of the affective and motivational dimension.

Consequently, the proposed measurement model was satisfactory and the developed items were found to adequately represent the hierarchical structure of the affective and motivational dimension.

Figure 8. Reliability estimates for the affective and motivational dimension



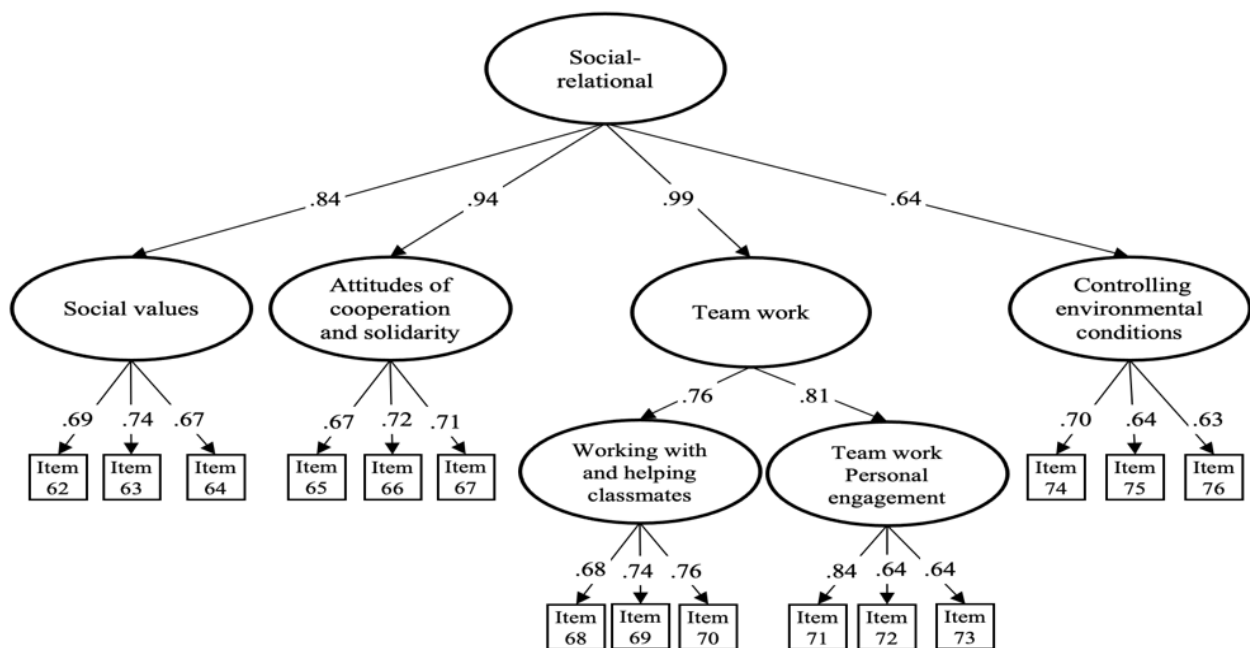
For the *social-relational* dimension, a hierarchical model comprising four first-level subdimensions was proposed, namely, social values, attitudes of cooperation and solidarity, control of environmental conditions, and team work. This latter subdimension was found to comprise two second-level subdimensions/subscales (Figure 9).

All of the indicators of the proposed model displayed excellent fit (Table 2). Obtained  $\chi^2$  indices were not significant and outcomes for

all other considered indicators (RMSEA, CFI and SRMR) were also in line with established thresholds.

With regards to the measurement model (Figure 9), all saturations were significant ( $p < .01$ ) and acceptable, with all being greater than .50 (Hair et al., 2010). Further, loadings were acceptable in all of the first- and second-level subdimensions, as well as in the social-relational dimension.

Figure 9. Hierarchical model pertaining to the social-relational dimension

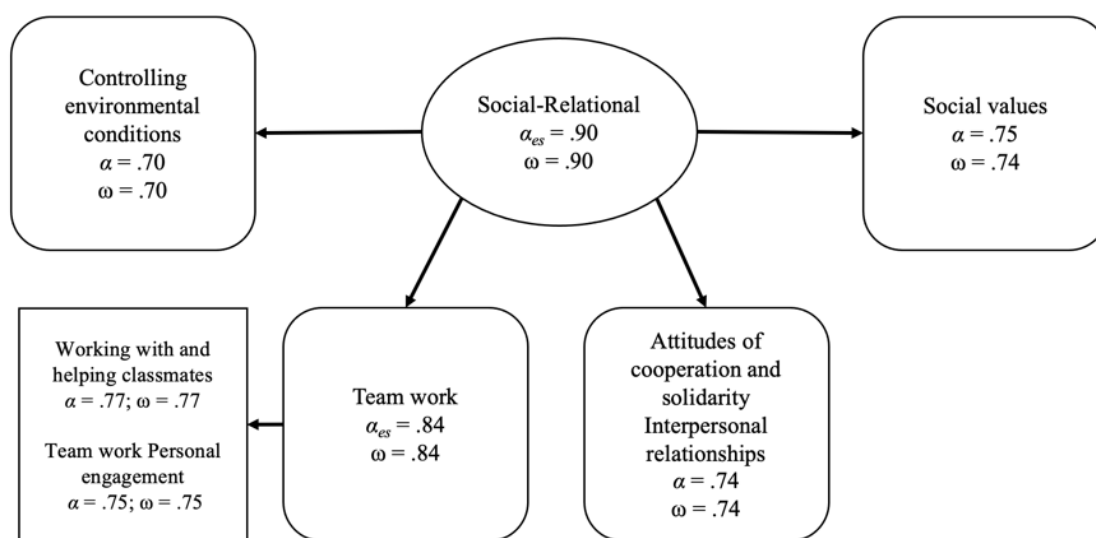


As for reliability estimations (Figure 10), values were equal to or greater than .70 for all of the three indices used – Cronbach’s  $\alpha$ , stratified  $\alpha$ , and McDonald’s  $\omega$  – and in all of the subdimensions that make up the dimension. Furthermore, values for these three indices were highly similar in all cases, indicating scale robustness. It should be noted that reliability estimates for the teamwork subdimension and the social-relational

dimension were excellent, being .84 and .90, respectively. All of this demonstrates acceptable internal consistency of the proposed structure of the social-relational dimension.

Consequently, the proposed measurement model was satisfactory and developed items were found to adequately represent the hierarchical structure of the social-relational dimension.

Figure 10. Reliability estimates for the social-relational dimension



The *ethical* dimension comprises three subdimensions: 1) social responsibility in learning 2) values, honesty and respect, and 3) respect for ethical and deontological codes.

All indicators of the proposed model displayed excellent fit (Table 2). Obtained  $\chi^2$  values were not significant and all other considered indicators (RMSEA, CFI and SRMR) were in accordance with established thresholds.

With regards to the measurement model (Figure 11), all saturations were significant ( $p < .01$ ) and acceptable, being above .50 (Hair et al., 2010). All saturations were acceptable with regards to the proposed model structure.

With regards to reliability estimations (Figure 12), both Cronbach’s  $\alpha$  and McDonald’s  $\omega$  indices were good for all three subdimensions, with values exceeding .70. Both indices were excellent for the ethics dimension. It should be noted that outcomes for the considered indices were highly similar in all cases, reflecting scale robustness. Thus, internal consistency of the proposed scale structure for the ethics dimension is acceptable.

Consequently, the proposed measurement model was satisfactory and the developed items were found to adequately represent the hierarchical structure of the ethics dimension.



Figure 11. Hierarchical model pertaining to the ethical dimension

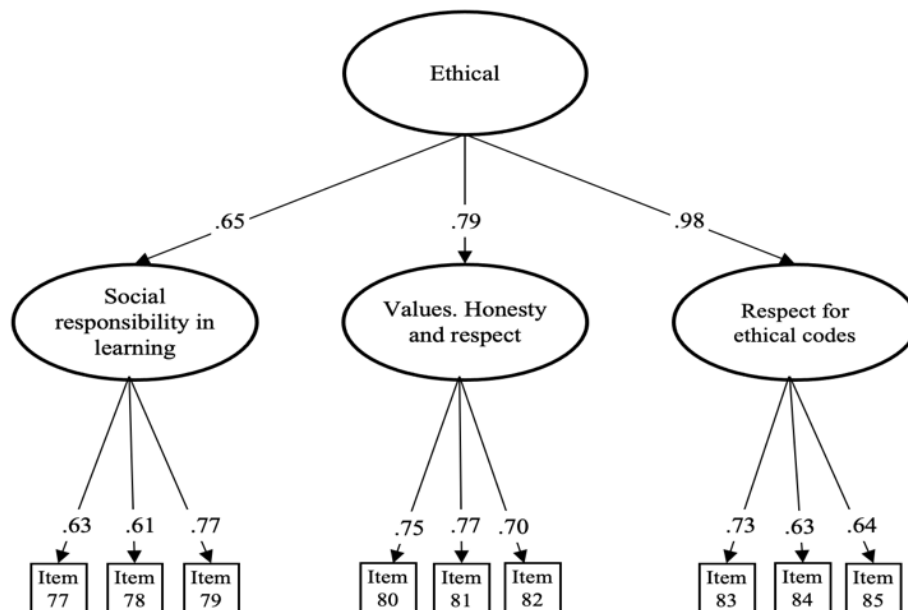
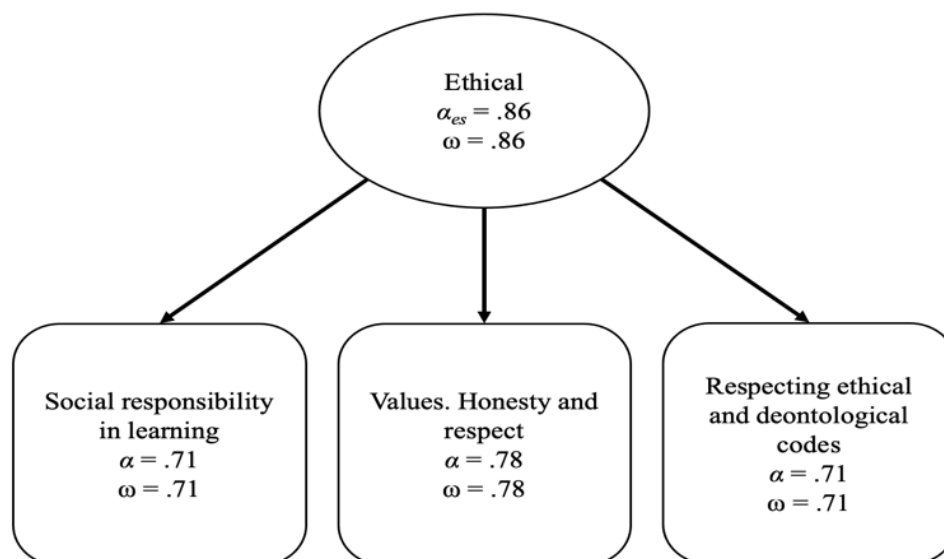


Figure 12. Reliability estimates for the ethical dimension



### Validation of the learning to learn construct

Having validated the dimensions that make up the LtL construct, the present subsection will present overall construct validation, according to its five dimensions.

To this end, a confirmatory factor analysis model (Figure 13) was developed in which the LtL construct comprised the following five

dimensions: cognitive, metacognitive, affective and motivational, social-relational, and ethical. Prior to this, in order to organise the dimensions, we decided to establish item groupings based on means calculated for various items evaluating a given construct (Brown, 2015).

All of the indicators of the proposed model displayed excellent fit (Table 3). The obtained  $\chi^2$  value was not significant, whilst all other considered indicators considered (RMSEA, CFI and SRMR) were found to be in line with previously established thresholds.

With regards to the measurement model (Figure 13), all saturations were significant ( $p < .01$ ) and acceptable, with all values being greater than .50 (Hair et al., 2010). In order to improve model fit, the correlation between the

social-relational and ethical dimensions was specified. Factor loadings were acceptable with regards to the proposed model structure.

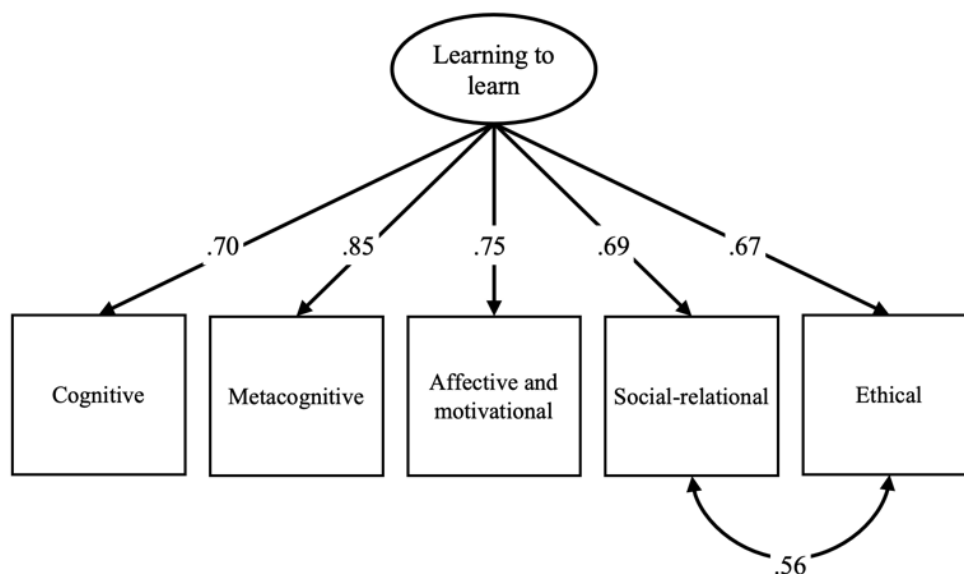
Cronbach's  $\alpha$  and McDonald's  $\omega$  reliability estimates were excellent, producing values of .87 and .85, respectively. Internal consistency was found to be acceptable.

Thus, the proposed measurement model was satisfactory and the five dimensions were found to appropriately represent the learning to learn construct.

Table 3. Fit indicators pertaining to the learning to learn construct

$\chi^2$		RMSEA					
$\chi^2$	g.l.	p	RMSEA	Int 90%	Pclose	CFI	SRMR
2.659	4	.616	.000	(.000-.036)	.994	1.000	.021

Figure 13. Model developed for the learning to learn construct



## Discussion and conclusions

The aim of the present work was to develop and validate a robust and comprehensive questionnaire for evaluation of the LtL competence. It was sought for this questionnaire to enable the collection of in-depth information and provide a better alternative to existing questionnaires. Outcomes of the present research addressed this aim and its pertinent objectives.

As its main output, the present study produced an instrument that was made up of five dimensions/scales (cognitive, metacognitive, affective-motivational, social-relational and ethical), twenty-one subdimensions/subscales and 85 items (Table 4). This reflects a more comprehensive structure than previously defined structures.

This validated questionnaire enables sufficient information to be collected about the

dimensions and subdimensions of the model, covering the essential elements of the competence (Autor et al., 2020). It also includes aspects that were not considered in earlier instruments (Villardón-Gallego et al., 2013; Muñoz-San Roque et al, 2016).

Furthermore, in contrast to the instruments conceived by García Bellido (2015), Häutamäki et al. (2002) and Hoskins and Fredriksson (2008), which were validated for other populations, the present questionnaire was designed to evaluate this specific competence in university students.

Instruments previously developed at a European level were developed for non-university populations. For instance, within the LEARN project mentioned above, Hautamäki et al. (2002) validated a questionnaire for primary- and secondary-school students, which included three components (*beliefs relating to context, beliefs relating to oneself, and learning competences*) and various dimensions. Further, within the work of the CRELL network, which was also discussed above, Hoskins and Fredriksson (2008), developed a questionnaire in collaboration with European experts that set out to be the “go-to” questionnaire in the European Union. This questionnaire included three dimensions – *affective, cognitive* and *metacognitive* – with various subdimensions and was designed for use with non-university students. As noted above, a large sample of 14-year-old students was used. Despite this, obtained outcomes did not satisfy the researchers who concluded that further studies were needed to improve the instrument. To the best of our knowledge, this work has yet to be done.

A questionnaire conceived by García Bellido (2015) was specifically designed to evaluate this competence in education professionals and, therefore, included dimensions beyond those usually considered by competence models.

With regards to university populations, Villardón-Gallego et al. (2013) developed an instrument that was made up of just 18 items and evaluated the following four dimensions:

*learning self-management, knowledge construction, self-knowledge as a learner and transfer of knowledge.* The authors validated the instrument with a sample of 487 students from five faculties at the Universidad de Deusto. As in the present study, they used confirmatory factor analysis, however, the developed instrument provided a somewhat limited examination of the competence overall due to the fact that it omitted a number of important variables outlined by well-known models (for example, from affective-motivational and social model). This was also the case with the instrument developed by Muñoz-San Roque et al. (2016) which was validated with a sample of 458 students attending public and private universities in the Comunidad de Madrid. Following CFA, these authors developed a questionnaire which comprised only 9 items organised between three dimensions: *managing the learning process, self-evaluation of the process* and *self-knowledge as a learner*. Once again, a number of key variables of this competence were omitted.

It is more common to see cognitive and metacognitive dimensions included within examined evaluation instruments and, occasionally, affective dimensions. In the present study, the affective dimension was highly relevant, with social-relational and ethical dimensions also being included. The rationale for doing this was explained in the introduction. Whilst the social dimension appears in some models (Stringher, 2014), it was not examined within the present questionnaire. The ethical dimension had not been previously considered prior to its inclusion in the model developed in the present study.

The questionnaire demonstrated acceptable construct validity as confirmed through expert evaluations and confirmatory factor analysis. From a strictly methodological perspective, it should be noted the factor solutions for the five scales/dimensions are probably not as parsimonious as they could be. For instance, many factors emerged in the cognitive dimension (eleven second-level

subdimensions), whilst several subdimensions contained only a small number of items, specifically, the second-level subdimensions describing “attention in class” and “establishing connections” within the managing information subdimension of the cognitive dimension, and the “tolerating frustration” and “internal attributions” subdimensions within the affective dimension. Nonetheless, acceptable internal consistency values were produced and as they are all relevant construct elements it was appropriate to retain them. Thus, it was decided to include these elements in the interests of allowing the most thorough assessments possible.

As with any self-report instrument, the present questionnaire has some limitations. For instance, it gives a general overview which is not sufficiently contextualised. In this sense, items refer to situations that are less specific than in other evaluation instruments which require tasks to be performed. Further, evaluation with the present instrument is performed *ex post facto*, meaning that individuals recall the way in which they operate and learn. It is therefore not as powerful a procedure as when direct measurements are performed at the moment a task is undertaken. Finally, there is also the possibility that respondents will not respond honestly and instead respond in line with what they deem to be socially acceptable.

Another limitation of the present work that should also be noted is that the sample was not statistically representative due to the fact that

purposive non-probability sampling was used. Nonetheless, students making up the sample came from a wide variety of courses which should attenuate this limitation. In any case, it is advised that future research examines the present model with broader samples and, where possible, samples that are representative of the population.

Despite the aforementioned limitations, it is maintained that instruments, such as the one described in the present paper, that are developed with the necessary rigour that is required of standardised tests are suitable for obtaining rich and abundant information from broad population samples. They also carry with them advantages such as ease of application and short administration times. This enables future studies to compare different samples, whilst descriptive, predictive and explanatory studies could also be used to produce worthwhile data, given that questionnaire outcomes can be used to analyse differences according to academic course, age, gender, etc. Further, data can be collected on other variables such as academic performance, learning styles, learning approaches, learning strategies, etc.

Similarly, the present tool can help teachers and researchers perform diagnoses of the skills, strategies and capacities that make up the LtL competence, with a view to developing training programmes where needed and provide a longitudinal measurement of the application of such programmes (Gargallo, Campos, & Almerich, 2016).

Table 4. Questionnaire structure

DIMENSIONS/SCALES	FIRST-LEVEL SUBDIMENSIONS/SUBSCALES	SECOND-LEVEL SUBDIMENSIONS/SUBSCALES
1. COGNITIVE (items 1 to 33)  33 items	1. Effective information management (items 1 to 19)	1.1. Searching for and selecting information (items 1, 2 and 3)
		1.2. Attention in class. Note taking (items 4 and 5)
		1.3. Establishing connections between what is learning and what is learned (items 6 and 7)
		1.4. Preparing and organising information (items 8, 9, and 10)
		1.5. Comprehensive memorisation (items 11, 12 and 13)
		1.6. Information retrieval (items 14, 15 and 16)
		1.7. Organising information to retrieve it in exams and coursework (items 17, 18 and 19)
2. Communication skills (items 20 to 26)	2. Communication skills (items 20 to 26)	2.1. Oral communication/expression skills (items 20, 21 and 22)
		2.2. Communicating in foreign languages (items 23, 24, 25 and 26)
3. ICT use (items 27, 28 and 29)	3. ICT use (items 27, 28 and 29)	
4. Critical and creative thinking (items 30, 31, 32 and 33)	4. Critical and creative thinking (items 30, 31, 32 and 33)	
2. METACOGNITIVE (items 34 to 45)  12 items	5. Knowledge of objectives, evaluation criteria and necessary strategies (items 34, 35 and 36)	
	6. Planning, organising and time management (items 37, 38 and 39)	
	7. Self-evaluation, control and self-regulation (items 40, 41 and 42)	
	8. Problem solving (items 43, 44 and 45)	
3. AFFECTIVE AND MOTIVATIONAL (items 46 to 58)  16 items	9. Intrinsic motivation (items 46, 47 and 48)	
	10. Tolerating frustration. Resilience (items 49 and 50)	
	11. Internal attributions (items 51 and 52)	
	12. Self-concept, self-esteem and self-efficacy (items 53, 54 and 55)	
	13. Physical and emotional well-being (items 56, 57 and 58)	
	14. Anxiety (items 59, 60, and 61)	
4. SOCIAL/ RELATIONAL (items 62 to 76)  15 items	15. Social values (items 62, 63 and 64)	
	16. Attitudes of cooperation and solidarity, and interpersonal relationships (items 65, 66 and 67)	
	17. Teamwork (items 68 to 73)	17.1. Working with and helping classmates (items 68, 69 and 70)
		17.2. Teamwork. Personal engagement (items 71, 72 and 73)
18. Controlling environmental conditions (items 74, 75 and 76)	18. Controlling environmental conditions (items 74, 75 and 76)	
5. ETHICS (items 77 to 85)  9 items	19. Social responsibility in learning (items 77, 78 and 79)	
	20. Values. Honesty and respect (items 80, 81 and 82)	
	21. Respecting ethical and deontological codes (items 83, 84 and 85)	



## References

- Abad, F.J., Olea, J., Ponsoda, V., & García, C. (2011). *Medición en Ciencias Sociales y de la Salud*. Síntesis.
- Almerich, G., Díaz-García, I., Cebrián Cifuentes, S., & Suárez-Rodríguez, J. (2018). Estructura dimensional de las competencias del siglo XXI en alumnado universitario de educación. *RELIEVE*, 24 (1). art. 5. <https://doi.org/10.7203/relieve.24.1.12548>
- Bandalos, D.L. (2018). *Measurement Theory and Applications for the Social Sciences*. The Guilford Press.
- Bandalos, D. L., & Finney, S. J. (2018). Factor analysis: Exploratory and confirmatory. En G. R. Hancock, L. M. Stapleton, y R. O. Mueller (Ed.), *The reviewer's guide to quantitative methods in the social sciences* (Second edition, pp. 98-122). Routledge. <https://doi.org/10.4324/9781315755649-8>
- Biggs, J. (2005). *Calidad del aprendizaje universitario*. Narcea.
- Brown, T. (2015). *Confirmatory factor analysis for applied research* (Second Edition). The Guilford Press.
- CE. (2006). *Recomendación del Parlamento Europeo y del Consejo de 18 de diciembre de 2006 sobre competencias clave para el aprendizaje permanente*. Recuperado el 29 de julio de 2020 de <https://goo.gl/6ayK8K>
- CE. (2018). *Anexo de la Propuesta de Recomendación del Consejo relativa a las competencias clave para el aprendizaje permanente*. Recuperado el 29 de julio de 2020 de <https://goo.gl/YD9pDw>
- Caena, F. (2019). *Developing a European Framework for the Personal, Social & Learning to Learn Key Competence*. Luxembourg: Publications Office of the European Union. <https://bit.ly/2vBzK8A>
- Deakin Crick, R., Haigney, D., Huang, S., Coburn, T., & Goldspink, C.H. (2013). Learning power in the workplace: the effective lifelong learning inventory and its reliability and validity and implications for learning and development. *The International Journal of Human Resource Management*, 24(11), 2255-2272. <https://www.tandfonline.com/doi/abs/10.1080/09585192.2012.725075>
- Elshout-Mohr, M., Meijer, J., Oostdam, R., & van Gelderen, A. (2004). *CCST: A Test for CrossCurricular Skills*. Amsterdam: SCO – Kohnstamm Institution, University of Amsterdam.
- Finney, S. J., & DiStefano, C. (2013). Nonnormal and categorical data in structural equation modeling. En G. R. Hancock & R. O. Mueller (Eds.), *Quantitative methods in education and the behavioral sciences: Issues, research, and teaching. Structural equation modeling: A second course* (pp. 439–492). IAP Information Age Publishing.
- Fraile, J., Gil-Izquierdo, M., Zamorano-Sande, D., & Sánchez-Iglesias, I. (2020). Autorregulación del aprendizaje y procesos de evaluación formativa en los trabajos de grupo. *RELIEVE*, 26(1), art. M5. <http://doi.org/10.7203/relieve.26.1.17402>
- García Bellido, M. R. (2015). *Diseño y validación de un instrumento para evaluar la competencia “aprender a aprender” en profesionales de la educación*. Tesis doctoral. Universidad de Valencia.
- Gargallo, B., Campos, C., & Almerich, G. (2016) Learning to learn at university. The effects of an instrumental subject on learning strategies and academic achievement. *Cultura y Educación*, 28 (4), 771-810. <https://doi.org/11356405.2016.1230293>
- Gargallo López, B., Pérez-Pérez, C., García-García, F.J., Giménez Beut, J.A., y Portillo Poblador, N. (2020). La competencia aprender a aprender en la universidad: propuesta de modelo teórico. *Educación XXI*, 23(1), 19-44. <https://www.readcube.com/articles/10.5944/educxx1.23367>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (Seventh edition). Upper Saddle River.

- Hautamäki, J., Arinen, P., Eronen, S., Hautamäki, A., Kupianien, S., Lindblom, B., Niemivirta, M., Pakaslahti, L., Rantanen, P., & Scheinin, P. (2002). *Assessing Learning-to-Learn: A Framework*. Helsinki: Centre for Educational Assessment, Helsinki University/National Board of Education.
- Hoskins, B. & Fredriksson, U. (2008). *Learning to learn: what is it and can it be measured?* Comisión Europea: Joint Research Centre, Institute for the Protection and Security of the Citizen. Centre for Research on Lifelong Learning (CRELL). <https://goo.gl/sSijfY>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, 6(1), 1-55. <https://doi.org/10.1080/10705519909540118>
- Jornet Meliá, J.J., García-Bellido, R., & González-Such, J. (2012). Evaluar la competencia aprender a aprender: una propuesta metodológica. *Profesorado. Revista de currículum y formación del profesorado*, 16 (1), 103-123.
- Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling* (Fourth Edition). Guilford.
- Lloret-Segura, S., Ferreres-Traver, A., Hernández-Baeza, A., & Tomás-Marco, I. (2014). El análisis factorial exploratorio de los ítems: una guía práctica, revisada y actualizada *Anales de Psicología*, 30 (3), 1151-1169. <https://doi.org/10.6018/analesps.30.3.199361>
- Lluch Molins, L., & Portillo Vidiella, M.C. (2018). La competencia de aprender a aprender en el marco de la educación superior. *Revista Iberoamericana de Educación*, 78 (2), 59-76. <https://doi.org/10.35362/rie7823183>
- McDonald, R. P. (1999). *Test theory: A unified treatment*. Lawrence Erlbaum Associates, Inc.
- Moreno, A. (2002). La evaluación de las habilidades metacognitivas. In A. Marchesi & E. Martín (Eds.), *Evaluación de la educación secundaria*. Fundación Santa María.
- Moreno, A., Cercadillo, L., & Martínez, M. (2008). *Learn European Project. Pre-Pilot Study National Report*. Ministerio de Educación.
- Muñoz-San Roque, I., Martín-Alonso, J. F., Prieto-Navarro, L., & Urosa-Sanz, B. (2016). Autopercepción del nivel de desarrollo de la competencia de aprender a aprender en el contexto universitario: propuesta de un instrumento de evaluación. *Revista de Investigación Educativa*, 34(2), 369-383. <https://doi.org/10.6018/rie.34.2.235881>
- Panadero, E. (2017). A Review of Self-regulated Learning: Six Models and Four Directions for Research. *Frontiers in Psychology*, 8, 422. <https://doi.org/10.3389/fpsyg.2017.00422>
- Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, 16(4), 385-407. <https://doi.org/10.1007/s10648-004-0006-x>
- Rajaratnam, N., Cronbach, L. J., & Gleser, G. C. (1965). Generalizability of stratified-parallel tests. *Psychometrika*, 30(1), 39-56. <https://doi.org/10.1007/BF02289746>
- Rosseel, Y. (2012). Lavaan: An R Package for Structural Equation Modeling. *Journal of statistical software*, 48 (2), 1-36. <https://doi.org/10.18637/jss.v048.i02>
- Ruge, G., Tokede, O., & Tivendale, L. (2019). Implementing constructive alignment in higher education – cross-institutional perspectives from Australia. *Higher Education Research & Development*, 38 (4), 833-848. <https://doi.org/10.1080/07294360.2019.1586842>

- Säfström, C. A. (2018). Liveable life, educational theory and the imperative of constant change. *European Educational Research Journal*, 17(5), 621-630. <https://doi.org/10.1177/1474904118784480>
- Stringher, C. (2014). What is learning to learn? A learning to learn process and output model. En R. Deakin Crick, C. Stringher y K. Ren, *Learning to learn* (9-32). Londres y Nueva York: Routledge.
- Viejo, C., & Ortega-Ruiz, R. (2018). Competencias para la investigación: el trabajo de fin de Máster y su potencialidad formativa. *Revista de innovación y buenas prácticas docentes*, 5, 46-56. <https://doi.org/10.21071/ripadoc.v5i.10970>
- Villardón-Gallego, L., Yániz, C., Achurra, C., Iraurgi, I., & Aguilar, M.C. (2013). Learning competence in university: development and structural validation of a scale to measure. *Psicodidáctica*, 18 (2), 357-374. <https://doi.org/10.1387/RevPsicodidact.6470>
- Weinstein, C. E. (1988). Assessment and training of student learning strategies. En R. R. Schmeck (Ed.), *Learning strategies and learning styles* (pp. 291-316). Plenum Press. [https://doi.org/10.1007/978-1-4899-2118-5\\_11](https://doi.org/10.1007/978-1-4899-2118-5_11)
- Weinstein, C.E., & Acee, T.W. (2018). Study and learning strategies. En R.F. Flippo y Bean T.W. *Handbook of College Reading and Study Strategy Research*. (pp. 227-240). Routledge. <https://doi.org/10.4324/9781315629810-17>
- Zhu, J., & Schumacher, D.J. (2016). Learning to Learn and Teaching to Learn. *MedEdPublish*. doi: <https://doi.org/10.15694/mep.2016.000063>
- Zimmerman, B.J., Schunk, D.H., & DiBenedetto, M.K. (2017). The role of self-efficacy and related beliefs in self-regulation of learning and performance. En A. J. Elliot, C.S. Dweck & D.S. Yeager (Eds.), *Handbook of competence and motivation* (Second Edition, pp. 313-333). Guilford Press.

## ANNEX



### QUESTIONNAIRE FOR EVALUATION OF THE LEARNING TO LEARN (LtL) COMPETENCE IN UNIVERSITY STUDENTS (QELtLCUS)

## INSTRUCTIONS

Please provide the information requested on the answer sheets for each questionnaire.

Read the different questionnaires carefully and select the answer that is closest to or best fits your situation. Remember that there are no right or wrong answers.

Put a cross in the box corresponding to the answer you choose. If you make a mistake, clearly cross out the wrong option and mark the one you think is appropriate:

### Information about the student answering the questionnaires:

**University:** \_\_\_\_\_

**Faculty or school:** \_\_\_\_\_

**University course being studied:** \_\_\_\_\_

**Year of degree course:** \_\_\_\_\_

1. **Gender:**  Male       Female

2. **Age:** \_\_\_\_\_

3. **University access route:**

- PAU (university entrance exam)
- Professional training
- Over 25
- Higher level university qualification
- Higher level university qualification
- Other

4. **Grades for first semester modules (numerical from 1 to 10):**

Name of module	Grade
Module number 1	
Module number 2	
Module number 3	
Module number 4	
Module number 5	
Module number 6	



	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. I know how to find the necessary study resources for my modules					
2. I am capable of selecting the information needed to study the modules successfully					
3. When I prepare modules, I can differentiate between what is fundamental and what is secondary					
4. I am attentive in class					
5. I take notes in class and am capable of compiling information					
6. When I read or study module content, I relate that content with what I already know					
7. I relate what I have learnt with my own experiences to integrate it better with what I already know					
8. When I study, I underline what is most important in order to better organise my ideas					
9. I make simple graphs, diagrams or tables to organise the study material					
10. I make summaries of the material I have to study					
11. When I have to memorise things, I organise them following certain criteria to learn them more easily					
12. To retain or memorise the content I have to learn, I imagine situations and objects that remind me of what I have learnt					
13. To memorise I use mnemonic methods (tricks like acronyms, abbreviations, keywords, etc.)					
14. I remember the content I have studied more easily if I think about the image of the page in the book or in my notes					
15. I use keywords I have learnt to remember the rest of the content related to them					
16. When I do not remember something I have studied, I look for information in my brain that enables me to remember it					
17. Before starting to write, I think and mentally prepare what I am going to write					
18. Before writing in exams, I remember everything I can then organise it in a plan or outline and finally expand on it					
19. Before doing a piece of written work, I make a plan, outline or programme with the points I have to cover					
20. I communicate effectively orally in academic activities, expressing ideas clearly and rigorously					
21. I defend my position orally, arguing appropriately in academic activities					
22. I express myself fluently in oral presentations in class or in other academic settings					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
23. I effectively use a foreign language with fluent oral communication					
24. I correctly read texts that relate to my studies or my future profession that are written in a foreign language					
25. I write correctly in one or more foreign languages					
26. I can communicate at a basic level in a foreign language					
27. I skilfully use the necessary basic software tools for the academic activity (text editor, spreadsheet, presentation software)					
28. I use specialised computer programs for my degree studies					
29. I learn to use the computer programs needed for an activity relatively quickly					
30. I critically analyse the concepts and theories presented in the modules					
31. In certain topics, once I have studied them and gone into depth, I am capable of contributing personal ideas and justifying them					
32. When a theory, interpretation or conclusion is set out in class or in books, I try to see if there are good arguments that support it					
33. I look for options and solutions for problems other than the ones commonly used					
34. I know the evaluation criteria the teachers use in the different subjects					
35. I know what I have to do to pass the modules					
36. I know what the aims of the modules are					
37. I plan my time to work effectively on all modules throughout the year					
38. I stay up to date when studying the topics of different modules					
39. I have a personal study and work timetable outside of class					
40. If I see that my initial plans do not achieve the success I hoped for in my studies, I change them to other more suitable ones					
41. I adapt my way of working to the requirements of different teachers and subjects					
42. If an exam has gone badly, I try to learn from my mistakes and study better the next time					
43. I effectively analyse and solve problems I encounter in learning					
44. When I am solving problems with a degree of complexity, I spend the necessary time on understanding them and planning the solution					
45. I like it when the teacher sets problems as a strategy for applying what we have learnt					
46. The most satisfying thing for me is to understand the content in depth					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
47. Learning is the most important thing for me at university					
48. The satisfaction of learning is the best stimulus					
49. I overcome failures when I am not successful in my learning					
50. If I do not pass something, I know I can do better and I make an effort to achieve it					
51. My academic performance depends on my effort					
52. My academic performance depends on my ability to organise myself					
53. I can learn the basic concepts taught in the different subjects					
54. I am capable of achieving what I propose in these studies					
55. I can master the skills we work on in the different modules					
56. I am normally physically well					
57. My state of mind is usually positive and I usually feel good					
58. I maintain a suitable state of mind for working					
59. At exam time, I think I will not be able to pass when I see everything I have to study					
60. When I take an exam, I think I have done worse than my classmates					
61. While I am sitting an exam, I think about the consequences of failing it					
62. I think I should learn not just for myself but also to contribute positively to society					
63. I maintain good relations with my classmates because it is something that is valuable for learning					
64. It is important to reflect on the professional role I will play in society					
65. I am an empathetic person and can put myself in someone else's shoes					
66. I help my classmates if they need it					
67. I think dialogue is a fundamental way of preventing and solving conflicts between people					
68. If I do not understand part of the content of a module, I ask another classmate for help					
69. I usually mention doubts about class content to my classmates					
70. I work with other classmates by sharing objectives and interests					
71. I participate actively in group work by contributing ideas and effort					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
72. If it is necessary to take on special responsibilities in group work, I am willing to do it					
73. When we work in a team and there are difficulties, I do not lose heart but, instead, collaborate actively to solve them					
74. I work and study in a suitable place: with good lighting, temperature, ventilation, lack of noise, necessary materials to hand, etc.					
75. I organise my work and study environment so I can study well					
76. I try to work in a fixed place that is suitable for studying and working					
77. When I learn content from a module, I think about how these lessons will help other people					
78. Undertaking higher education obliges me to work to improve society					
79. I accept my responsibility to the society that has given me the opportunity of studying					
80. I am honest with my classmates					
81. I am honest with my teachers					
82. I respect my classmates even if I do not share their ideas or opinions					
83. I act ethically in my work as a student					
84. I fulfil my obligations as a student					
85. It is vital to learn the ethical and deontological norms that will govern my professional practice					

### Authors / Autores

**Gargallo-López, Bernardo** ([bernardo.gargallo@uv.es](mailto:bernardo.gargallo@uv.es))  0000-0002-2805-4129

He is a professor of Educational Theory at the University of Valencia. He won the First National Prize of Educational Research from the Ministry of Education and Science in 2000 with a research on learning strategies and also in 2002, with a work on ICT and education. He is director of the GIPU-EA research group, working on university pedagogy and teaching and learning processes. His main line of research today and the competitive projects he has led in recent years focus on teaching and learning at the university and learning-centered methods. He is currently leading a research project on the competence learning to learn in college (EDU2017-83284-R).

**Suárez-Rodríguez, Jesús M.** ([Jesus.M.Rodriguez@uv.es](mailto:Jesus.M.Rodriguez@uv.es))  0000-0002-2815-7988

He is a professor in the Department of Research Methods and Educational Diagnosis in Education at the University of Valencia. He is the coordinator of the Research Group on Research Methods in Education and ICT (MIETIC). His work focuses on the methodological, analytical and measurement elements in the fields of Social Sciences and Health. In recent years, his priority line of research focuses on the impact of ICT at different educational levels. He won the First National Prize of Educational Research, together with the first author, in 2002, for a work related to the modeling of the influence of ICT in educational centers.

**Pérez-Pérez, Cruz** ([cruz.perez@uv.es](mailto:cruz.perez@uv.es))  0000-0002-4843-249X

He is a professor of Educational Theory at the University of Valencia. His research has focused on the learning of values, attitudes and norms, prevention of gender violence, entrepreneurship and Service Learning at the university. In recent years he has participated in several R + D + i projects on learning and teaching at the university. He is currently co-directing a project on the competence of learning to learn in university students.

**Almerich-Cerveró, Gonzálo** ([gonzalo.almerich@uv.es](mailto:gonzalo.almerich@uv.es))  0000-0002-8952-4104

He is a full professor in the Department of Research Methods and Educational Diagnosis in Education at the University of Valencia. His research career focuses on the integration of information and communication technologies (ICTS) in education, 21st century skills, student learning processes, educational measurement and educational research methodology. He won the First National Prize for Educational Research from the Ministry of Education and Science in 2004 with a research on the integration of ICTS in education.

**Garcia-Garcia, Fran J.** ([Francisco.Javier.Garcia-Garcia@uv.es](mailto:Francisco.Javier.Garcia-Garcia@uv.es))  0000-0002-6267-0080

He is a research personnel in training in the Department of Theory of Education at the University of Valencia. His research interests focus on inclusive education, with special emphasis on the education of deaf children, and on teaching-learning at the university. He is developing his doctoral thesis within the project "Operational design of the 'learning to learn' competence for university degrees, Assessment instruments and proposals for teaching."



**Revista ELectrónica de Investigación y EValuación Educativa**  
*E-Journal of Educational Research, Assessment and Evaluation*

[ISSN: 1134-4032]



Esta obra tiene [licencia de Creative Commons Reconocimiento-NoComercial 4.0 Internacional](https://creativecommons.org/licenses/by-nc/4.0/).

This work is under a [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by-nc/4.0/).