

Cross-curricular competencies in university: validation of a questionnaire for evaluation

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How to cite this article: Solanes-Puchol, A., Martín-del-Río, B. & García-Selva, A. (2022). Cross-curricular competencies in university: validation of a questionnaire for evaluation. *Revista Digital de Investigación en Docencia Universitaria*, 16(2), e1538. <https://doi.org/10.19083/ridu.2022.1538>

Received: 23/09/2021. **Revised:** 14/12/2021. **Accepted:** 20/12/2021. **Published:** 30/06/2022.

Abstract

Introduction: Transversal competences constitute a key element for the academic-professional training and socio-labour insertion of university students. Numerous studies reveal a gap between the level of generic skills and the level demanded by the labor market. The evaluation of these competencies becomes essential in university education, so it is necessary to have valid evaluation tools. **Objective:** To develop a measurement instrument that effectively evaluates said competencies. **Method:** a questionnaire has been designed based on the model used by Solanes et al. (2008), using the Delphi method to assess content validity. The test has been administered to 946 students, dividing this sample into four equal subgroups to carry out two parallel analyzes and two confirmatory factor analyzes. **Results:** The final scale is composed of 38 items that explain 53.1% of the variance, with a McDonald's omega of .94. The parallel analysis reveals a factorial structure of five factors. Likewise, the confirmatory factor analyzes provide evidence of validity on the internal structure of the questionnaire (CMIN/DF = 1.903; RMSEA = .062; CFI = .91; PNFI = .657; NFI = .90; RMR = .042; PGFI = .88). **Discussion:** An instrument is provided that meets the specifications to be considered a valid and reliable tool, which evaluates the transversal skills most demanded by the labor market.

Keywords: questionnaire; transversal competencies; validation; reliability; employability.

Competencias transversales en la universidad: validación de un cuestionario para su evaluación

Resumen

Introducción: Las competencias transversales constituyen un elemento clave para la formación académico-profesional e inserción sociolaboral del alumnado universitario. Numerosos estudios dan cuenta de una brecha entre el nivel de competencias genéricas y el nivel demandado por el mercado laboral. La evaluación de estas competencias se torna fundamental en la formación universitaria, por lo que es necesario contar con herramientas de evaluación válidas. **Objetivo:** Desarrollar un instrumento de medición que evalúe eficazmente dichas competencias. **Método:** Se ha diseñado un cuestionario a partir del modelo utilizado por Solanes et al. (2008), utilizando el método Delphi para evaluar la validez de contenido. La prueba fue administrada a 946 estudiantes, dividiendo esta muestra en cuatro subgrupos iguales para efectuar dos análisis paralelos y dos análisis factoriales confirmatorios. **Resultados:** La escala definitiva está compuesta por

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38 ítems que explican el 53.1% de la varianza, con un omega de McDonald de .94. El análisis paralelo revela una estructura factorial de cinco factores. Asimismo, los análisis factoriales confirmatorios proporcionan evidencias de validez sobre la estructura interna del cuestionario (CMIN/DF = 1.903; RMSEA = .062; CFI = .91; PNFI = .657; NFI = .90; RMR = .042; PGFI = .88). **Discusión:** Se proporciona un instrumento que reúne las especificaciones para ser considerado una herramienta válida y fiable, que evalúa las competencias transversales más demandadas por el mercado laboral.

Palabras clave: cuestionario; competencias transversales; validación; confiabilidad; empleabilidad.

Introduction

In recent decades, the labor environment has shown an increasing interest in human capital, the development of its potential, and the adequacy of its competencies to the company's goals, considering these elements as decisive factors for the development of organizations (Rivero & Dabos, 2017). Thus, the concept of competencies is increasingly becoming the top priority, both in academia and in the labor area. However, despite representing a wide field of research and application in professional practice, we are far from finding a complete and universal definition of the competency construct (Michavila et al., 2018). Nevertheless, the existing literature on the study of competencies evidences a common point in their conceptualizations: the consideration of competencies as the combined integration of theoretical knowledge, practical skills, values, and attitudes, which go beyond the sum of all these characteristics separately, allowing a satisfactory performance in very diverse contexts (Enríquez et al., 2011).

Competencies are, generally, classified according to their area of application and can be specific or generic.

The specific competencies are those that are concretely related to a specific job or area of knowledge, while generic competencies refer to cross-curricular competencies, which are transferable to a multitude of functions and tasks (Solanes et al., 2008). Thus, cross-curricular

competencies are considered fundamental in training students to work in various professional fields and to adapt themselves appropriately into society (Ortega, 2010). Various national and international organizations have pointed out the role they play in promoting productivity, competitiveness, and innovation, reducing unemployment, favoring cohesion and social justice, and even fighting inequality and marginalization (OECD, 2015). Therefore, cross-curricular competencies currently stand not only as a professional need, but also as a social requirement to face changes and employability (Rodríguez Esteban et al., 2019)..

Competencies, Education System, and Labor Market

One of the demands posed by society to the University is to enhance and facilitate the socio labor insertion of future graduates. Therefore, it is essential to bring positions closer and create cooperation strategies between higher educational institutions and the labor market (Astigarraga & Carrera Farran, 2018). In this sense, the university system has proposed an educational model whose objective is to train students in generic and specific competencies in order to provide them with a professional profile that guarantees their insertion in the labor market, and their permanence and development in it (Ruiz Corbella et al., 2019). From this perspective, the ultimate purpose of university education is to train competent professionals within the framework of their own degree, guaranteeing the acquisition of the necessary skills for optimal professional practice in a complex and changing work environment, without neglecting the development of knowledge, extension, and connection with society (González Morga et al., 2018).

As can be seen, this educational model is intimately related to the term employability, understood as the ability to get a job, and maintain it or acquire a different one if required (Hillage & Pollard, 1998). Therefore, employability necessarily implies the acquisition of competencies demanded by the labor market, which improve the possibility of finding a job and maintaining good performance in it (Ruiz-Corbella et al., 2019).

However, this greater demand for competencies has not been matched by a greater competency background shown by graduates. Despite the acceptable level of preparation with which they join companies, some authors report that university graduates are not well trained in the generic skills demanded by employers (Bartual Figueras & Turmo Garuz, 2015; González Lorente & Martínez Clares, 2016; Martín et al., 2013; Rodríguez Esteban et al., 2019). And the fact is that companies are not only looking for generic profiles with appropriate training and experience, but also demand professionals who also possess skills and attitudes that guarantee an outstanding and flexible professional practice (Pérez García, 2018). Therefore, it is still advisable to bring higher education closer to the needs of the labor market, where socio-economic development obliges companies to have professionals with a constant capacity to adapt. At this point, the evaluation of cross-curricular competencies acquires a fundamental role, since it will make it possible to determine the degree to which graduates develop their generic competencies in preparation for their labor market insertion.

Studies on Competency Assessment

As Delgado García et al. (2005) point out, the large number of existing competencies, their diverse assessment methodology, and sometimes their overlapping nomenclature, make it difficult to offer a final list of them. However, this has not prevented various studies from being carried out on the assessment of cross-curricular competencies and their relationship with the occupational and professional area. For example, Bartual Figueras and Turmo Garuz (2015) reported that, in recent years, the labor market has placed greater emphasis on the acquisition of cross-curricular competencies, even using them as discriminating elements among job candidates. Other studies also show a relationship between cross-curricular competencies and other skills and potentialities. For example, greater development of competencies is positively and significantly associated with greater performance in sports (García-Selva et al., 2019) and better

academic development (Martín del Río et al., 2019). Likewise, greater development of cross-curricular competencies is also related to higher levels of mobility and progression in a worker's career path (Rodríguez Esteban et al., 2019).

However, the university setting constitutes the field with the most experience regarding the analysis and evaluation of cross-curricular competencies (Martínez Clares & González Morgia, 2018). It is possible to find in the literature various works that aim to design assessment instruments that offer a valid measurement of the cross-curricular competencies acquired by university students. In this regard, one of the first works that pursued this purpose was the one developed by Solanes et al. (2008), in which the authors developed an instrument aimed at assessing generic competencies in university students, relating them to their potential insertion in the labor market.

More recently, Álvarez-Benítez et al. (2013) developed a questionnaire of 62 items and three dimensions, based on numerous definitions of generic and emotional competencies. For their part, Aguado et al. (2017) developed a questionnaire composed of 185 items distributed in 26 dimensions, based on the competencies identified by the Tuning project (González & Wagenaar, 2003). Finally, it is worth mentioning the questionnaire developed by Martínez-Clares and González-Morgia (2018), structured in 15 dimensions and 57 items, and aimed at assessing the adequacy of training in cross-curricular competencies in university students.

Although these assessment instruments are very useful for determining the development of cross-curricular competencies in the university setting, it should be added that their theoretical basis is far removed from the current reality of the labor market. As noted above, there is a significant gap between the generic competencies demanded by employers and those acquired by university graduates (Rodríguez Esteban et al., 2019). To explain this discrepancy, it is necessary to know the degree of importance given by companies and employers to each cross-curricular competency. In this regard,

Solanes et al. (2014) found that the competencies most valued by companies are responsibility and motivation at work, the ability to work in a team, the ability to learn, ethical commitment, and concern for quality and improvement. Similarly, Fitó and Martínez Argüelles (2016) compiled information on the most demanded competencies by 212 employers, finding that the ability to work in a team, the ability to improve, the ability to organize and plan, and ethical commitment and responsibility were the most demanded competencies for recent graduates.

Considering these data, it is noteworthy that qualities related to responsibility, improvement, and commitment are currently more highly valued in the labor market. Organizations are increasingly aware that professionalism includes, in addition to the classic competencies, personal integrity and ethical professional conduct. Thus, training in these skills is also a key factor, since most work problems are not only of a technical or scientific nature, but also include ethical aspects, and responding appropriately will require a competency background that is difficult to improvise (Ruiz-Corbella et al., 2019).

In summary, the above data and thoughts reflect the importance that companies attach to the acquisition and development of cross-curricular competencies in university students. However, at present, a gap between the university setting and the labor market can be observed, not only in terms of the way of understanding competencies, but also in relation to what competencies should be acquired during university training and those required by the labor market (Mareque Álvarez-Santullano et al., 2019). Therefore, it is considered necessary to continue working on the line of research focused on the evaluation of generic competencies in the university setting.

Method

This paper is focused on developing a generic competency evaluation questionnaire that allows to appropriately determine the professional

competencies acquired by the student in a higher education context, considering these competencies in terms of their demand and usefulness in the labor and professional world.

Design

Instrumental study (Montero & León, 2005), a category that includes all research work aimed at the development of tests and devices, including both the design (or adaptation) and the study of their psychometric properties.

Participants

A total of 946 students (64% female) from 11-degree programs at a Spanish university participated in the study, selected by convenience sampling. The mean age was 21.73 years (SD = 5.47), with a minimum of 18 years and a maximum of 59 years. The distribution by year was 435 in the first year (46%), 76 in the second year (8%), 170 in the third year (18%) and 265 in the fourth year (28%). Thus, for the corresponding statistical analyses, the total sample was divided into four completely random subsamples, whose characteristics are shown in Table 1.

Instruments

Gathering of information was carried out based on the modification of the instrument developed by Solanes et al. (2008) for the evaluation of cross-curricular competencies, thus constituting a second version of this instrument. Thus, this questionnaire aims to analyze the development of cross-curricular competencies in university classrooms. The responses are recorded on a Likert-type scale with five options: (1) Insufficient; (2) Not enough; (3) Sufficient; (4) Strongly; and (5) Very strongly.

Procedures

To create the questionnaire, the authors used the theoretical model applied by Solanes et al. (2008) in the development of a first psychometric test for the evaluation of competencies in university students, which is based on the process of Evaluation of Potential focused on Competency Management in organizations (Delgado, 1999). Following the guidelines for the construction of

Table 1*Randomly Drawn Subsamples from the Total Number of Participants*

	n	Sex	Average age	SD	Min. age	Max. age
Subsample 1 (n1)	236	60% women	21.61	5.31	18	59
Subsample 2 (n2)	236	61% women	21.75	5.54	18	55
Subsample 3 (n3)	237	62% women	22.03	5.72	18	48
Subsample 4 (n4)	237	59% women	21.81	5.78	18	54

Nota: N = 946.

multiple choice items of Haladyna et al. (2002), as well as those of Moreno et al. (2004), 45 items representative of the behavioral domain of the competency construct were developed, including technical and psychological factors, attitudes, teamwork, leadership, and performance/results. In addition, considering research on the competencies most demanded by employers (Fitó & Martínez Argüelles, 2016; Solanes et al., 2014), other items were developed to assess the constructs of concern for improvement, responsibility, and commitment, considering them as key cross-curricular competencies.

Thus, 21 representational items from the behavioral domain of the new constructs of interest were added. These items were developed based on the Competency Management model proposed by Alles (2016), using the definitions formulated for the cross-curricular competencies of commitment, responsiveness, and quality and continuous improvement. Alles' (2016) model has been widely applied and has demonstrated its usefulness in the field of organizations and the work environment (Chávez Sánchez & Sandoval Guerrero, 2016; Lozano, 2019; Nahum et al., 2017), which is in line with the purpose of this paper to elaborate a questionnaire that assesses both the cross-curricular competencies developed in university and those that are currently of greatest interest to employers and companies.

A validation with experts was conducted using the Delphi method, since it is a recognized technique in areas related to education (Okoli & Pawlowski, 2004). Following the instructions of this method, first, a list of experts on the specific

topic of the present study was drafted; then, each expert was asked about his or her knowledge on the topic to be addressed, offering a clear and explanatory message about the reason for his or her collaboration; finally, the responses were analyzed and the areas and items on which they agreed and those on which they differed were identified.

Therefore, a total of six former experts in the field of educational psychology and university training, whose research experience guaranteed their participation in the content validation phase, were involved. The conventional Delphi method was applied, consulting the experts in two rounds. Hence, in the first round, the first version of the questionnaire was sent, the experts were asked to provide a quantitative assessment on a Likert scale ranging from 1 (a little) to 5 (a lot), and a qualitative assessment on the relevance and clarity of the dimensions and questions, their wording, structure, and completeness. The evaluations proposed by the experts were then analyzed and, based on their opinions and comments, the suggestions were incorporated, and the necessary modifications were made to finalize the second version. In the second round, this new version was sent for evaluation, after which the suggestions and proposals were again analyzed, integrating the necessary modifications, and thus obtaining the final version of the questionnaire.

Therefore, the questionnaire had a total of 66 items, with a Likert format and five response categories. The questionnaires were administered at the university, in person, by means of printed

questionnaires. The students were informed beforehand about the purpose of the study and the voluntary nature of their participation, and about confidentiality and data processing, all to maximize the validity of the information obtained.

Data Analysis

Following the instructions of Lloret-Segura et al. (2014), a sequential use of exploratory and confirmatory factor analysis was made, randomly dividing the total sample into four subsamples of equal size. Thus, with subsamples 1 and 2, factor analyses were performed using parallel analysis. Confirmatory factor analyses (CFA) were performed with subsamples 3 and 4 to test the five-factor model suggested by the parallel analysis.

Parallel Analysis

To assess its validity, a first parallel analysis was performed based on the polychoric matrices with subsample 1, with classical implementation (Horn, 1965), unweighted least squares (ULS) extraction method, prominent oblique rotation and considering the 95th percentile for recommending dimensions (Lorenzo-Seva & Van Ginkel, 2016). To determine the adequacy of the correlation matrix, the Kaiser-Meyer-Olkin (KMO) index was calculated, considering that a value above .8 would be appropriate (Pett et al., 2003). Bartlett's test of sphericity was also carried out to test the null hypothesis of absence of correlation between the variables (Bartlett, 1950). This procedure allowed us to obtain evidence on the optimal number of factors of the questionnaire. Subsequently, with subsample 2, the second forced parallel analysis was performed to the number of factors indicated by the first one and, from the rotated factor matrix, those items whose factor weights were less than .40 in the factor where they loaded the most, which had cross-loadings less than .30 in the other factors and whose differences with the others were less than .20 were eliminated (Howard, 2015; Williams et al., 2010). Parallel analyses were performed with FACTOR, version 12.

Confirmatory Factor Analysis

A first CFA was performed with subsample 3 using maximum likelihood (ML) estimation in order to estimate the factor weights with the overall model fit indicators in a robust manner. The scale was considered valid when the fit indicators were within the following limits: CMIN/DF < 3, RMSEA < .08, NFI > .9, CFI > .9 and PNFI > .5 (Hair et al., 2014). Likewise, another complementary CFA was performed with subsample 4, using the unweighted least squares (ULS) method, to generate robust fit indicators for ordinal measures (RMR < .08 and PGFI > .9). These analyses used AMOS 23.

Finally, the reliability of the scale was analyzed through the McDonald Omega coefficient as an internal consistency coefficient, obtained through the FACTOR 12 program.

Results

After the completion of the questionnaire and record of the responses, descriptive statistics were calculated for the 66 initial items (Table 2).

The first parallel analysis was then performed with subsample 1 ($n^1 = 236$), subjecting this analysis to eight factors (Table 3). The results suggest that the optimal number of factors is five, so the parallel analysis was repeated with subsample 2 ($n^2 = 236$), now limiting this procedure to five factors (Table 3). An admissible solution was found (KMO = .912; $\chi^2 = 2442.7$; $p = .000$) that explains 53.1% of the variance. In this last phase, applying Howard's rule (2015) and eliminating the items with low or complex factor loadings, the scale was reduced to 38 items and 5 dimensions (Table 4).

Table 5 shows the number of items contained in each dimension, their mean and standard deviation, as well as the results obtained in the internal consistency analysis for each dimension. It should be noted that all the dimensions obtained a McDonald omega above .70. Regarding the reliability of the overall instrument, the McDonald omega obtained for the total scale is .94.

Table 2
Item, Mean, Standard Deviation, Skewness, and Kurtosis

Ítem	M	DE	g1	g2
1. Career knowledge	3.46	0.95	-0.541	-0.112
2. Ability to concentrate (to study, pay attention, and concentrate in class)	3.58	0.87	-0.476	0.014
3. Ability to innovate in internships or work	3.51	0.83	-0.278	0.055
4. Ability to assess the academic results obtained (favorable or unfavorable)	3.89	0.79	-0.674	0.906
5. Ability to adapt (to new situations: new course, new professors, schedule changes, etc.)	4.06	0.81	-0.831	0.905
6. Ability to foresee, plan	3.67	0.89	-0.358	-0.181
7. Ability to organize my study and work time (ability to structure, organize, and distribute the resources available to me to achieve the objectives)	3.58	0.95	-0.426	-0.152
8. Ability to organize work teams	3.51	0.88	-0.380	0.066
9. Ability to make the best use of my own resources	3.75	0.83	-0.380	-0.083
10. Ability to make the best use of the resources of the educational institution where I am studying	3.35	0.84	-0.200	-0.182
11. Ability to negotiate	3.44	0.93	-0.329	-0.242
12. Ability to solve problems (ability to analyze situations, make decisions, and put them into practice in an effective manner)	3.75	0.82	-0.494	0.422
13. Ability to summarize (from some data, I am able to project the most important ones, the conclusions)	3.73	0.84	-0.300	-0.219
14. Competitive spirit (achievement of a goal with better results than others)	3.35	1.01	-0.136	-0.527
15. Skills to maintain my usual performance (in conflictive situations)	3.56	0.85	-0.437	0.318
16. Ability to act with poise and firmness in stressful situations	3.49	0.88	-0.269	-0.104
17. Ability to work in a team	3.98	0.78	-0.616	0.472
18. Ability to manage internships or jobs (ability to ensure the completion of tasks efficiently, within the established deadline and with the expected resources)	3.84	0.83	-0.383	-0.084
19. Voluntariness (personal choice that moves one to perform something without external precept or impulse that compels me) for teamwork	3.69	0.90	-0.447	-0.101
20. Ability to easily relate to my peers	4.02	0.85	-0.654	0.126
21. Communication skills (ability to relate by making myself understood and listening to others)	3.88	0.87	-0.558	0.106
22. Interpersonal relationship skills (empathy, tact, and listening as skills to relate with others)	4.01	0.79	-0.519	0.082
23. Ability to easily relate to my superiors (delegates, professors, institutional positions...)	3.73	0.85	-0.373	-0.091

24. Entrepreneurial spirit	3.49	0.90	-0.282	-0.178
25. Ability to get others to accept my ideas and proposals	3.46	0.75	-0.156	0.030
26. Trustworthiness (ability to inspire confidence, cooperation, and support in my peers)	3.75	0.78	-0.372	0.088
27. Skills to persuade and gain advantage without provocation. hostilities (to induce, move, compel someone with reason to believe or do something)	3.40	0.83	-0.271	-0.029
28. Ability to easily accept new responsibilities or new positions (delegate, student representation...)	3.38	0.95	-0.304	-0.334
29. Satisfaction in managing people and resources (reward, compensation, contentedness for being in charge of people or resources)	3.32	0.89	-0.059	-0.311
30. Skills to present a good image of the University to the outside world	3.46	0.92	-0.472	0.140
31. Ability to know my own personal and professional characteristics	3.77	0.82	-0.446	0.155
32. Stability (ability to maintain balance in stressful, adverse, or time-limited situations)	3.67	0.82	-0.436	0.277
33. Self-confidence (trust in my potential abilities and putting my career knowledge into practice)	3.60	0.94	-0.444	-0.176
34. Motivation (for career, attending classes, for study)	3.90	0.89	-0.667	0.376
35. Skills to maintain usual performance (in the face of time-limited situations)	3.65	0.83	-0.339	0.066
36. Ability to act with ease (when presenting projects in public)	3.33	1.04	-0.228	-0.458
37. Perseverance (desire to achieve the objectives set)	3.81	0.86	-0.507	0.121
38. Ability to easily accept new responsibilities	3.68	0.83	-0.409	0.053
39. Ability to find new and original solutions for my work (paid or unpaid), while bringing new perspectives to it	3.59	0.80	-0.301	0.102
40. Ability to overcome my problems in the face of any difficulty without recourse to superiors	3.62	0.81	-0.260	-0.059
41. Ability to perform a different job for which I have been or am being trained	3.52	0.88	-0.337	-0.076
42. Commitment to the university to help it grow	3.16	0.95	-0.179	-0.285
43. Ability to give the best of myself when the university requires it	3.46	0.88	-0.361	0.078
44. Ability to perform my job <i>conscientiously</i>	3.90	0.74	-0.445	0.467
45. Ability to manage my time well	3.65	0.89	-0.369	-0.046
46. Confidence from my colleagues in the work I do	3.82	0.74	-0.398	0.389
47. Integrity, honesty, and rectitude in my work	4.13	0.71	-0.510	0.273
48. Ability to plan my actions at work for efficiency	3.73	0.76	-0.232	0.066
49. Adequate presence in my academic work environment	3.82	0.77	-0.478	0.555
50. Punctuality (classmates, class attendance, academic events, etc.)	3.90	0.99	-0.730	0.104
51. Awareness of security measures (physical spaces, IT, risk prevention...)	3.87	0.85	-0.563	0.293
52. Ability to accept the rules	4.09	0.81	-0.692	0.345

53. Agreement with the policies of the educational institution where I am pursuing my studies	3.57	0.91	-0.402	0.149
54. Desirable behaviors from my peers, superiors, and institution	3.69	0.76	-0.257	0.015
55. Agreement with the policies of the professors teaching the subjects I pursue	3.48	0.83	-0.387	0.443
56. Undesirable behaviors toward my coworkers and superiors	2.74	1.39	0.268	-1.207
57. Ability to impose my principles during my studies (execution of work, themes, practices, relations with my colleagues strictly related to the academic field)	3.27	0.90	-0.256	0.177
58. Ability to put my values before those of the university	3.79	0.85	-0.173	-0.181
59. Ability to work in a professional manner	3.79	0.85	-0.619	0.523
60. Objectivity in the work and in the situations arising from it based on facts	3.78	0.74	-0.232	0.087
61. Impartiality, balance, and fairness in the work	3.76	0.74	-0.289	0
62. Ability to apply any type of ideology in the development of my work	3.45	0.84	-0.270	0.189
63. Consideration of quality as an essential value	3.89	0.75	-0.425	0.416
64. Acceptance that my work is subject to review (by my peers or superiors)	3.97	0.79	-0.574	0.392
65. Ability to share my knowledge with others	4.02	0.76	-0.621	0.674
66. Self assessment (ability to criticize myself and my work)	4.14	0.77	-0.788	0.995

Note: N = 946.

Table 3
Results of the Parallel Analysis

Parallel analysis limited to eight factors (n1 = 236)				Parallel analysis limited to five factors (n2 = 236)			
Factor	Eigenvalue	Media simulated eigenvalues	95 th percentile simulated eigenvalues	Factor	Eigenvalue	Media simulated eigenvalues	95 th percentile simulated eigenvalues
1	21.946*	2.24	2.354	1	20.233*	1.662	1.714
2	3.277*	2.125	2.205	2	3.111*	1.607	1.645
3	2.689*	2.042	2.111	3	2.545*	1.567	1.60
4	2.202*	1.97	2.034	4	2.073*	1.532	1.565
5	2.194*	1.91	1.969	5	1.971*	1.501	1.531
6	1.735	1.851	1.906				
7	1.471	1.798	1.848				
8	1.425	1.748	1.794				

* Recommended number of dimensions when considering the 95th percentile

Table 4*Rotated Factor Loadings Matrix*

Item	Factor loadings				
	1	2	3	4	5
Factor 1: Concern for quality and improvement					
63	.780	-.021	.112	-.109	-.076
61	.733	.049	.015	-.105	-.059
60	.655	.053	.068	-.081	-.059
51	.640	-.009	.287	-.007	-.084
64	.637	-.103	.142	.044	.013
43	.611	-.052	.175	.061	-.05
59	.603	.073	.102	-.053	-.070
66	.573	.159	.168	.158	.107
50	.450	-.155	.131	.014	.095
49	.448	-.051	-.052	.025	.061
Factor 2: Ability to negotiate					
27	-.037	.606	.172	.253	-.141
25	-.101	.587	.093	.221	-.018
11	-.107	.474	.037	.154	.001
57	.102	.446	.077	.026	.070
8	-.095	.442	-.145	.169	.047
46	.067	.418	-.122	.160	.132
12	-.101	.407	.169	.111	.106
Factor 3: Ability to adapt					
28	.128	-.096	.606	.141	.106
40	-.051	.238	.560	-.052	.025
39	.031	.186	.532	.082	-.083
38	.151	.046	.462	.146	.077
3	.135	.038	.427	.023	.180
32	-.057	.150	.426	.061	.204
16	.196	.094	.423	.116	.058
33	-.089	.102	.406	.090	.189
Factor 4: Interpersonal skills					
21	.061	.105	-.148	.872	-.088
22	.131	-.040	-.044	.851	-.103
20	.091	-.039	-.106	.833	.007
23	.091	.187	-.103	.553	.005

Factor 5: Ability to plan and organize

7	-.008	-.142	-.130	-.073	.873
6	.027	-.157	-.159	.081	.797
45	.151	-.048	-.040	-.081	.783
2	.049	.062	-.076	-.065	.692
48	.104	.062	.240	-.082	.617
65	.067	-.048	-.014	.294	.566
34	.190	.052	-.020	.069	.503
4	-.059	-.046	.163	.137	.453
1	-.065	.085	.013	.062	.413

Note: $n^2 = 236$. Parallel analysis with classical implementation (Horn, 1965) with ULS estimation method, prominent rotation. Factor loadings greater than .40 are in bold.

Table 5

Psychometric Properties of the Cross-Curricular Competencies Questionnaire in University

Factor	Number of items	M	DE	McDonald's Omega
Concern for quality and improvement	10	3.84	0.51	.83
Ability to negotiate	7	3.52	0.56	.79
Ability to adapt	8	3.57	0.58	.84
Interpersonal skills	4	3.91	0.69	.84
Ability to plan and organize	9	3.72	0.56	.83

Note: $N = 946$

Finally, in relation to the evaluation of the validity of the internal structure of the questionnaire, a confirmatory factor analysis was conducted to check the extent to which the data confirm the factorial model of the instrument. Thus, with subsample 3 ($n3 = 237$), a CFA was performed using the maximum likelihood (ML) method. All parameters were relevant ($w > .4$) and significant ($p < .05$). The result of this analysis can be seen in Figure 1.

Once the model has been determined, the adequacy of its factor structure is assessed. Table 6 shows the indexes used to test the fit of the model to the data. In addition to the global fit indexes (CMIN/DF and RMSEA), incremental fit measures are also presented, such as those corresponding to the parsimony normed fit index (PNFI), the normalized fit index (NFI) and the comparative fit

index (CFI). For the latter two, values of .95 or higher are considered excellent, and values above .90 suggest an acceptable fit of the model to the data; with respect to the PNFI, values above .50 on this index indicate a good model fit. As for the CMIN/DF index, values below 3 are indicative of a good fit; on the other hand, the RMSEA is considered optimal when its values are of .05 or lower, and acceptable in the range of .05 to .08 (Barret, 2007; Hair et al., 2014). It is worth noting that the average of the squared multiple correlations of this first CFA is .479. Finally, with subsample 4 ($n4 = 237$), another CFA was performed using the unweighted least squares (ULS) method to obtain robust fit indicators for ordinal measures. In this case, the values of the RMR and PGFI indexes are shown (Table 6).

Table 6*Coefficients and Model Goodness-of-fit Indexes*

CMIN/DF	RMSEA	CFI	PNFI	NFI	RMR	PGFI
1.903	.062	.91	.657	.90	.042	.88

The first factor, called concern for quality and commitment, includes ten items, which include competencies related to the consideration of quality and improvement as essential values, the commitment to work in a professional, objective, and impartial manner, and the self-evaluation or from others. This dimension analyzes the attitude of the individual to contribute to the improvement, modernization, or optimization of the processes and tasks of the individual's position.

The second factor refers to the ability to negotiate and includes seven items that relate to the ability to persuade in an ethical manner, using solid and well-founded arguments to influence others through strategies that make it possible to build satisfactory agreements for both parties.

The third factor is called ability to adapt and is composed of eight items that assess competencies related to the availability of resources to face problems autonomously, the ability to maintain performance in complex situations, or the ability to easily assume new responsibilities and tasks. This factor reflects the ability to work effectively in varied or new situations, modifying one's approach as the situation requires, and adapting resources to the requirements of the task.

The fourth factor corresponds to interpersonal skills, and groups four items that include social interaction and cooperation competencies. It involves the ability to interact with others, generating and maintaining a good work environment.

Finally, the fifth factor refers to the ability to plan and organize, which includes nine items that evaluate the management of time, the ability to determine and use the appropriate means and resources, considering the stages, actions, and deadlines required for the achievement of objectives.

Discussion

This paper resulted in the development of a 38-item questionnaire that evaluates the following cross-curricular competencies: (1) concern for quality and commitment, (2) ability to negotiate, (3) ability to adapt, (4) interpersonal skills, and (5) ability to plan and organize. Likewise, the CFA shows that the structure of the questionnaire is valid and adequate for measuring the skills and abilities that are included in the cross-curricular competencies acquired by students in university. Specifically, these competencies coincide to a large extent with those considered to be the most valued by employers (Fitó & Martínez Argüelles, 2016; García-Montalvo, 2002; Munuera & Navarro, 2015; Solanes et al., 2014).

As mentioned above, the importance that the socio labor environment attaches to the training and development of competencies nowadays justifies the relevance of this instrument, as well as broadening its fields of use. In this sense, one of its obvious applications would be in the academic environment, being of great value for students and even educational institutions. As pointed out by Marko et al. (2019), the competencies that most interest teachers are the cross-curricular ones. Their inclusion in the curriculum and development is the challenge that university education must face. Thus, this questionnaire offers teachers and institutions a useful instrument to measure the cross-curricular competencies of their students, during and after the completion of their studies, identifying the training needs of students within their curricular development.

On the other hand, the usefulness of this instrument in improving the higher education system should also be highlighted. Bearing in

mind that the cornerstone of university education is the faculty (López Ruiz, 2011), the use of this questionnaire would allow professors to have feedback during the student's development, which would contribute to improving teaching quality and innovation in training and evaluation methods. Similarly, with this information it would also be possible to design and redirect the academic content of trainers so that it is in line with the competency objectives of students, to implement educational programs based on professional profiles, or to promote new teaching roles focused on guidance and monitoring of learning.

Likewise, the organizational environment is also an area in which this assessment instrument can be used, since it would make it possible, for example, to know the level of professional competencies of the candidate for a position, as well as to provide relevant information for selection processes, in which recruitment can be defined according to the professional competencies required for the position to be filled. In short, the application of this questionnaire guarantees the fulfillment of objectives that are key to the proper management of human capital in organizations (Caballero & Blanco, 2007).

On the other hand, it is worth highlighting some of the limitations found in this study. The most obvious lies in the characteristics of the sample used: although it is true that the number of participants for the development of the questionnaire is high and sufficient, the fact that they all belonged to a single university could restrict the validity of the results, thus making the findings not completely generalizable. It would be interesting, therefore, to also confirm the validity of the instrument with data from other universities to check the behavior of the scale in other higher education institutions. Moreover, the current controversy in cross-curricular competencies between the academic and professional spheres (Mareque Álvarez-Santullano et al., 2019) stands out, which makes it difficult to use a theoretical model that encompasses all the competencies considered relevant. This makes it necessary to constantly monitor the reality of the labor market and not to neglect the training requirements it imposes in the field of university education.

Finally, another limitation to consider is that, given the characteristics and conditions of the participants, it has not been feasible to obtain the intraclass correlation coefficient, so it has not been possible to determine the temporal stability of the scores of the measuring instrument. Therefore, it would be useful and interesting to develop new studies that could provide the necessary data to obtain this index, in order to guarantee maximum reliability in the use of this instrument.

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Attachment 1

Competencies Evaluation Questionnaire II

- 1 Career knowledge
- 2 Ability to concentrate (to study, pay attention, and concentrate in class)
- 3 Ability to innovate in internships or work
- 4 Ability to assess the academic results obtained (favorable or unfavorable)
- 6 Ability to foresee, plan
- 7 Ability to organize my study and work time (ability to structure, organize, and distribute the resources available to me to achieve the objectives)
- 8 Ability to organize work teams
- 11 Ability to negotiate
- 12 Ability to solve problems (ability to analyze situations, make decisions, and put them into practice in an effective manner)
- 16 Ability to act with poise and firmness in stressful situations
- 20 Ability to easily relate to my peers
- 21 Communication skills (ability to relate by making myself understood and listening to others)
- 22 Interpersonal relationship skills (empathy, tact, and listening as skills to relate with others)
- 23 Ability to easily relate to my superiors (delegates, professors, institutional positions...)
- 25 Ability to get others to accept my ideas and proposals
- 27 Skills to persuade and obtain advantages without provoking hostilities (induce, move, force someone with reasons to believe or do something)
- 28 Ability to easily accept new responsibilities, or new positions (delegate, student representation, etc.)
- 32 Stability (ability to maintain balance in stressful, adverse, or time-limited situations)
- 33 Self-confidence (trust in my potential abilities and putting my career knowledge into practice)
- 34 Motivation (for career, attending classes, for study)
- 38 Ability to easily accept new responsibilities
- 39 Ability to find new and original solutions for my work (paid or unpaid), while bringing new perspectives to it
- 40 Ability to overcome my problems in the face of any difficulty without recourse to superiors
- 43 Ability to give the best of myself when the university requires it

- 45 Ability to manage my time well
 - 46 Confidence from my colleagues in the work I do
 - 48 Ability to plan my actions at work for efficiency
 - 49 Adequate presence in my academic work environment
 - 50 Punctuality (classmates, class attendance, academic events, etc.)
 - 51 Awareness of security measures (physical spaces, IT, risk prevention...)
 - 57 Ability to impose my principles during my studies (execution of work, themes, practices, relations with my colleagues strictly related to the academic field)
 - 59 Ability to work in a professional manner
 - 60 Objectivity in the work and in the situations arising from it based on facts
 - 61 Impartiality, balance, and fairness in the work
 - 63 Consideration of quality as an essential value
 - 64 Acceptance that my work is subject to review (by my peers or superiors)
 - 65 Ability to share my knowledge with others
 - 66 Self assessment (ability to criticize myself and my work)
-