Validation of the COMP-CRI Scale: New Job Competencies in Times of Crisis

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Abstract:

Purpose: The Covid-19 pandemic evidenced the need for workers to develop skills to cope with changes, and in turn, for companies to create employment strategies. "Being a resilient company implies having the capacity (in terms of knowledge, skills, and attitudes) to survive changing, unpredictable, or directly unfavorable situations" that allow adequate work management. Therefore, this study aims to validate a scale of job competencies in times of crisis, which allows identifying the capacities, knowledge, skills, and attitudes of employees to manage the training of staff in the future.

Design/Methodology/Approach: The present investigation establishes the Scale of Work Competencies in Crisis (COMP-CRI) as a new solid psychometric instrument. The COMP-CRI scale was validated after collecting data from 401 workers belonging to SMEs (small and medium-sized enterprises) from different provinces of the Highlands of Ecuador. The study design, having a descriptive scope, was non-experimental and longitudinal. Factor structures, reliability, and validity scores were also examined with the help of the SPSS-21 statistical program. Similarly, it included content validity through expert judgment, confirmatory factor analysis, reliability with Cronbach's Alpha, and intra-observer reliability was evaluated with the Kappa index.

Findings: From this, the content analysis was carried out through the judgment of experts. The first review of the questions was obtained with nine dimensions and 27 questions. The confirmatory factor analysis used the Principal Components method and the anti-imagen test.

Practical Implications: This study contributes directly to the construction of new literature; although the study of competencies is comprehensive, it is essential to know which competencies are critical for the success or failure of a business.

Originality/Value: The COMP-CRI Scale develops competencies that were not observed before, such as the appropriate management of social networks. Nowadays, small and medium-sized companies have increasingly found the need for the owners of the companies and their workers to promote their business through the use of social networks.

Keywords: Employment strategies, training, work management.

JEL Classification: M53, M54.

Research type: Research article.

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1. Introduction

The Covid-19 pandemic has highlighted the accelerated changes at the organizational level, changes that undoubtedly modify the organizational structure of each company, some of them more strengthened than others will manage to overcome the crisis and adequately face emerging situations. In this context, small and medium-sized enterprises (SMEs) are not an exception, since due to their characteristics, they would be the ones that receive the most forceful impact that this new pandemic entails in the first instance (Huillcapí et al., 2020).

There is no controversy in stating that there have always been entrepreneurs and businesspeople, the former being understood as those people who voluntarily decide to take the initiative to undertake a project that eventually leads to the establishment of enterprises or triggers other entrepreneurial projects. By businesspeople, we understand those who are dedicated to managing companies with a partial or total shareholding. While entrepreneurship seems to be strongly associated with very personal aptitudes and attitudes that can nevertheless be enhanced and stimulated by society, and particularly by the State, the businessman responds to a role for which he can be educated, trained, and coached, of course, without discarding that this subject must possess management skills (Linares, 2020).

Nowadays, there have been great changes in different areas, in communications, the knowledge economy, and the labor market, which trigger flexible jobs that reveal new needs of employers, who must compete in an increasingly insecure context, as well as future workers, who seek success in their professional career and self-realization through work (Blustein et al., 2008; Do Cebu and Moreno, 2010).

Thus, labor competencies become one of the main axes for the subsistence of organizations. Given the existing skills gap in the market, both in knowledge and professional skills (soft skills) and attitudes, companies must assume a greater role (Masclans and Canals, 2020). The arrival of the next horizons of the post-COVID-19 era could be characterized as the era of the "urgency of the moment." Therefore, the competition here is about the ability not to lose sight of the actions that might be necessary for tomorrow (Buheji, 2020).

Levenson (2020) states that this pandemic could have a series of phases and, therefore, an emergent reaction is needed, followed by a reflection on the challenges that arise. As the world strives to resume its activity towards better productivity and progressive growth, it would have to face the crisis and re-adjust to the prerequisites of the new normal, in which we would witness changes in the speed and quality of workers training. Organizations would have as part of their vision the care for the worker's well-being in exchange for a high demand for employability competencies.
Almost all leading organizations would work on retraining their employees or recruiting according to the requirements of the new normal (Meister, 2020). By the preceding, the objective of this research was to build and test the validity and reliability properties of the COMP-CRI Scale, trying to make it a valuable tool, both for use in research activities and training programs.

2. Literature Review

According to Gil (2007), he considers that the labor competency required for a job position must be carried out in work performance situations; that is by verifying knowledge, skills, and values in actual practices; since the evaluation of competencies discriminates those techniques that are based on the behavior of people in the workplace.

Currently, some instruments allow the identification and evaluation of job competencies, most of which entail an adaptation of personality traits to the language of competency. One of them is the COMPETEA, which was created to be a test designed to assess competencies and not personality traits (Arribas, 2015).

Another method used when evaluating labor competencies is the Assessment Centre, which has advantages in personnel management, due to the flexibility and easy adaptability of the exercises to different cultures; being, in addition, the most suitable for evaluating people who occupy high positions; as it changes the traditional evaluation of managers; however, it presents a high cost for the implementation of the exercises, infrastructure, and interpretation of the results (Torres, 2014).

There are undoubtedly several techniques for collecting information on labor competencies as shown in Table 1, without neglecting that the interview is the primordial one in any process of recruitment or promotion of personnel, in this case, referring to the competencies, it is usual to perform it with the BEI or critical incident interview. It is a semi-structured interview in which the interviewer inquires about recent experiences lived by the interviewee to obtain concrete behaviors in as much detail as possible to codify them in competencies (Alles, 2006).

3. Research Methodology

Thus, according to the above mentioned, the COMP-CRI Scale originates from the critical-incidents method, through a selection of critical competencies determined through a previous qualitative study where the necessary labor competencies to face crises were identified; considering that companies are constantly facing unstable periods not only due to events such as the Covid-19 pandemic but also due to situations inherent to an economy in crisis. Therefore, this study's objective is to validate the COMP-CRI scale of labor competencies in times of crisis, with which it
is possible to identify the worker’s competencies and thus strengthen them to improve their performance.

**Table 1. Data collection techniques**

| Sources of Information                      | Evaluation Instruments                                      |
|--------------------------------------------|------------------------------------------------------------|
| Practical experience                       | • Checklists.                                              |
|                                            | • Observation scale systems.                               |
|                                            | • Critical Incidents.                                      |
|                                            | • Simulation and practical exercises.                      |
| Characteristics and experiences of the     | • Psychological tests.                                     |
| evaluate                                   | • Collection of biographical information.                  |
|                                            | • Evaluation interview.                                    |
|                                            | • Portfolios.                                              |
| Assessments of the evaluatee or other      | • Self-report on behaviors.                                |
| members of the organization                | • Balance of competencies.                                 |
|                                            | • 360° Evaluation.                                         |

**Source:** Gil Flores, 2007.

The following are the stages that were carried out for the construction of the COMP-CRI Scale according to Hogan's (2004) methodological suggestions for the construction of the tests:

**A. Literature review and operationalization of the construct.** - A detailed search and analysis of various theories and research were conducted to delimit the construct of the concept of competencies theoretically; in addition, a focus group was conducted in a previous study developed within the framework of this research project, in which the competencies that would constitute the scale were determined through experts in the area and owners of SMEs.

**B. Preparation of the items.** - A preliminary set of 27 items was drafted to operationalize each of the variables. The COMP-CRI instrument was designed in the first instance with nine dimensions classified into soft and complex competencies. The total number of competencies to be evaluated was nine: Orientation to Results, Relationship Building, Vision and Anticipation, Decision Making, Resilience, Emotional Intelligence, Creativity, Initiative, and Social Networks.

The recommendations of Matesanz, (1997) were considered for the wording of the statements, which are clear, simple, and understandable for the participants. Likewise, the questions were ordered and interleaved. Each question was composed of 4 items, presenting different situations, with a score based on the competency model A=4 B=3 C=2 D=1.
C.- Analysis by expert judgment. - The content validity was analyzed through the expert judgment method, with the participation of 5 specialists in the subject of study, who judged each item considering its formal quality (semantic clarity, syntactic correctness, and adequacy to the population) and with their contribution, observations, and suggestions, all the questions and answers were analyzed until they were rewritten.

D.- Data analysis. - In the first instance, the preliminary version of the test, consisting of 27 items, was applied to a non-probabilistic sample composed of 401 people, 217 men (51.62%) and 184 women (48.37%), aged between 19 and 51 years (M= 32.5). The education level of the participants was as follows: no education (4.48%), high school (35.16%), third level (39.15%), fourth level (21.19%). In high position (32.91%), medium position (32.41%), low position (34.66%).

The length of service in the position among the participants consisted of 1 to 5 years (66.83%), 6 to 9 years (18.70%), more than ten years (14.21%). The construct validity was determined by factor analysis, using the anti-image correlation method and Principal Components, Cronbach's Alpha, split-half analysis, Kappa stability index.

4. Results and Discussion

In the first instance, a normality test was performed, to verify the distribution of the data where the alternate hypothesis was accepted where p ≤ .000 (Table 2).

Table 2. Tests of Normality

| Tests of Normality                  | Kolmogorov-Smirnov<sup>a</sup> Statistic | Kolmogorov-Smirnov<sup>a</sup> df | Kolmogorov-Smirnov<sup>a</sup> Sig. | Shapiro-Wilk Estadístico Statistic | Shapiro-Wilk Estadístico df | Shapiro-Wilk Estadístico Sig. |
|-------------------------------------|------------------------------------------|----------------------------------|-----------------------------------|-----------------------------------|-----------------------------|-----------------------------|
| Orientation to results total        | .164                                     | 398                              | .000                              | .921                              | 398                         | .000                        |
| Social networks total               | .145                                     | 398                              | .000                              | .940                              | 398                         | .000                        |
| Relationship building total         | .188                                     | 398                              | .000                              | .897                              | 398                         | .000                        |
| Vision and anticipation total       | .141                                     | 398                              | .000                              | .934                              | 398                         | .000                        |
| Decision making total               | .142                                     | 398                              | .000                              | .940                              | 398                         | .000                        |
| Creativity total                    | .172                                     | 398                              | .000                              | .914                              | 398                         | .000                        |
| Resilience total                    | .171                                     | 398                              | .000                              | .935                              | 398                         | .000                        |
| Emotional intelligence total        | .181                                     | 398                              | .000                              | .896                              | 398                         | .000                        |
| Initiative total                    | .167                                     | 398                              | .000                              | .917                              | 398                         | .000                        |

<sup>a</sup> Lilliefors Significance Correction

Source: Own creation.
After validating this analysis, the Bartlett's test of sphericity was carried out (df = 1205; p ≤ .000) in order to determine if the data fitted the factor analysis as shown in (Table 3); as well as the Kaiser-Meyer-Olkin Index (KMO) (.80). If the index was greater than .7, factor analysis was justified.

**Table 3. KMO and Bartlett test**

| KMO and Bartlett tests |  |
|------------------------|--|
| Kaiser-Meyer-Olkin Measure | .800 |
| Bartlett's test of sphericity | Aprox. Chi-square 1205.239 |
| df | 210 |
| Sig. | .000 |

*Source: Own creation.*

In addition, the criterion of a load equal to or greater than .30 was considered to consider an item as representative of a factor, as shown in Table 4. In this way, the factors have good values, as shown in the anti-image table (Table 5), according to the recommendations of Tabachnick and Fidell (1989). Thus, based on the results described the items that did not agree with the specified criteria were eliminated, coinciding with Cronbach's Alpha index, leaving the scale composed of 21 items.

**Table 4. Factor analysis - table of communalities**

| Communalities | Initial | Extraction |
|---------------|---------|------------|
| Question 2    | 1.000   | .678       |
| Question 3    | 1.000   | .744       |
| Question 4    | 1.000   | .716       |
| Question 6    | 1.000   | .693       |
| Question 7    | 1.000   | .609       |
| Question 8    | 1.000   | .603       |
| Question 10   | 1.000   | .614       |
| Question 12   | 1.000   | .539       |
| Question 13   | 1.000   | .647       |
| Question 14   | 1.000   | .511       |
| Question 15   | 1.000   | .656       |
| Question 16   | 1.000   | .820       |
| Question 17   | 1.000   | .541       |
| Question 18   | 1.000   | .578       |
| Question 19   | 1.000   | .512       |
| Question 20   | 1.000   | .676       |
| Question 22   | 1.000   | .594       |
| Question 24   | 1.000   | .555       |
| Question 25   | 1.000   | .657       |
| Question 26   | 1.000   | .538       |
| Question 27   | 1.000   | .713       |

*Source: Own creation.*
Table 5. Factorial Analysis anti-image matrix

| Question | Anti-image correlation |
|----------|------------------------|
| Question 2 | .747                   |
| Question 3 | .814                   |
| Question 4 | .762                   |
| Question 5 | .736                   |
| Question 6 | .821                   |
| Question 7 | .778                   |
| Question 8 | .791                   |
| Question 9 | .824                   |
| Question 10 | .727                  |
| Question 11 | .831                  |
| Question 12 | .852                   |
| Question 13 | .806                   |
| Question 14 | .833                   |
| Question 15 | .710                   |
| Question 16 | .793                   |

Source: Own creation.

To assess the reliability of the Inventory, the Cronbach's Alpha internal consistency analysis was performed with a value of (0.78), which is considered acceptable (George and Mallery, 2010); this analysis allowed the elimination of some inconsistent questions, leaving a total of 20 questions (Table 6).

Table 6. Reliability analysis

| Question 2 | Cronbach's Alpha | N of items |
|------------|------------------|------------|
|            | .781             | 20         |

| Total element statistics | Scale mean if the element has been deleted | Scale variance if the element has been deleted | Corrected element-total correlation | Cronbach's Alpha if the element has been deleted |
|--------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------|-----------------------------------------------|
| Question 2               | 62.9068                                    | 52.590                                        | .214                              | .780                                          |
| Question 3               | 62.8892                                    | 50.639                                        | .307                              | .775                                          |
| Question 4               | 62.7179                                    | 51.557                                        | .274                              | .776                                          |
| Question 6               | 62.8564                                    | 51.154                                        | .302                              | .774                                          |
| Question 7               | 62.7028                                    | 50.381                                        | .434                              | .766                                          |
| Question 8               | 62.7884                                    | 51.359                                        | .319                              | .773                                          |
| Question 10              | 62.5995                                    | 51.407                                        | .337                              | .772                                          |
| Question 12              | 62.7607                                    | 50.097                                        | .373                              | .770                                          |
| Question 13              | 62.6902                                    | 51.305                                        | .330                              | .773                                          |
| Question 14              | 62.7557                                    | 49.902                                        | .373                              | .770                                          |
| Question 15              | 62.9622                                    | 50.935                                        | .283                              | .776                                          |
| Question 17              | 62.7960                                    | 49.925                                        | .411                              | .767                                          |
| Question 18              | 62.8589                                    | 50.162                                        | .319                              | .774                                          |
| Question 19              | 62.6196                                    | 51.964                                        | .301                              | .774                                          |
| Question 20              | 62.6171                                    | 50.606                                        | .396                              | .769                                          |
| Question 22              | 62.6549                                    | 50.954                                        | .357                              | .771                                          |
| Question 24              | 62.6977                                    | 48.838                                        | .535                              | .759                                          |
| Question 25              | 62.8388                                    | 50.504                                        | .332                              | .773                                          |
| Question 26              | 62.5642                                    | 51.211                                        | .377                              | .770                                          |
| Question 27              | 62.7280                                    | 51.714                                        | .314                              | .774                                          |

Source: Own creation.
In addition, the split-half analysis was conducted with which the Cronbach's Alpha was verified through the unequal length Alpha = (.78) as shown in the following Table 7.

**Table 7. Split-half reliability analysis method**

| Reliability Statistics | Value | N of items |
|------------------------|-------|------------|
| Cronbach's Alpha       | Part 1| .630       |
|                        |       | 11 a       |
|                        | Part 2| .650       |
|                        |       | 10 b       |
|                        | Total | .644       |
|                        | N of items | 21 |
| Correlation between forms |     | \(.784\)    |
| Spearman-Brown Coefficient |    | \(.784\)    |
| Guttman Split-half Coefficient | | \(.783\)    |

*a. The items are: Question2, Question3, Question4, Question6, Question7, Question8, Question10, Question11, Question12, Question13, Question14, Question15, Question16, Question17, Question18, Question19, Question20, Question22, Question23, Question24, Question25, Question26, Question27, Question28, Question29, Question30.*

**Source:** Own creation.

Finally, the test retest was carried out with a time difference of 1 month, it was done through stability analysis using the Kappa index where the following values were obtained Orientation to results= 0.84, Relationship building= 0.84, Vision and anticipation= 0.84, Decision making= 0.85, Creativity= 0.85, Resilience= 0.85, Emotional Intelligence= 0.89, Social Networks= 0.85 as shown in Table 8.

**Table 8. Stability result of the Kappa index test.**

| Orientation to results test-retest | Value | Asymptotic standard error |
|-----------------------------------|-------|---------------------------|
| Measure of agreement Kappa        | .847  | .020                      |
| N of valid cases                  | 399   |                           |

*a. Not assuming the null hypothesis.  
b. Using the asymptotic standard error assuming the null hypothesis.*

| Relationship building test-retest | Value | Asymptotic standard error |
|-----------------------------------|-------|---------------------------|
| Measure of agreement Kappa        | .847  | .020                      |
| N of valid cases                  | 399   |                           |

*a. Not assuming the null hypothesis.  
b. Using the asymptotic standard error assuming the null hypothesis.*
| Test                                      | Value | Asymptotic standard error | Measure of agreement | N of valid cases |
|-------------------------------------------|-------|---------------------------|----------------------|------------------|
| **Vision and anticipation test-retest**   |       |                           |                      |                  |
| Kappa                                    | .842  | .020                      |                      | 400              |
| **Decision making test-retest**           |       |                           |                      |                  |
| Kappa                                    | .857  | .019                      |                      | 400              |
| **Creativity test-retest**                |       |                           |                      |                  |
| Kappa                                    | .855  | .020                      |                      | 400              |
| **Social networks test-retest**           |       |                           |                      |                  |
| Kappa                                    | .855  | .020                      |                      | 399              |
| **Emotional intelligence test-retest**    |       |                           |                      |                  |
| Kappa                                    | .893  | .017                      |                      | 400              |

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
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The COMP-CRI Scale has proven to be a valid and reliable instrument and aims to assess job competencies in times of crisis significantly. Thus, according to the different types of indicators and methods implemented in the analysis of the Scale's psychometric properties, favorable evidence has been obtained regarding its internal consistency, structural validity, and stability. The internal consistency of the COMP-CRI scales through the analysis of Cronbach's Alpha was acceptable, with an average of .78.

Likewise, it was possible to detect a nine-component factorial matrix, which provides a first theoretical validation assumed in the development of the Scale. The instrument is better aligned with new theoretical developments in training and supervision, including competency-based approaches (Falender and Shafranske, 2007; Gonsalvez, 2014; Pilling and Roth, 2014).

5. Conclusions and Recommendations

This study contributes directly to the construction of new literature; although the study of competencies is comprehensive, it is essential to know which competencies are critical for the success or failure of a business. The COMP-CRI Scale develops competencies that were not observed before, such as the appropriate management of social networks.

Nowadays, small, and medium-sized companies have increasingly found the need for the owners of the companies and their workers to promote their business through the use of social networks. During the economic and health crisis caused by COVID-19, they have resorted to a series of business strategies aligned with the use of e-commerce and massive use of social networks, not only the official ones but also those of the workers, who, assuming responsibility for their commitments to the SME, have established networks and relationships with customers, which have strengthened alternative forms of commercial exchange (González-Díaz and Flores Ledesma, 2020).

It is important to emphasize that in the future, it is expected to perform other statistical validations in order to contrast it with another instrument that allows confirming its validity, as well as the appropriate adaptation based on sociodemographic aspects such
as the type of position, gender, type of company and other factors that could generate changes according to the competencies addressed in this study.

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