

Psychometric Properties of the Job Search Assessment Questionnaire (CEBE) in Ecuadorian University Graduates: A Validation Study

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Abstract: The “job search” is an essential life skill for adults and has varying economic, emotional, and social implications. The Job Search Assessment Questionnaire (CEBE) measures important areas including information, planning, skills, self-efficacy, and motivation. While it has demonstrated satisfactory psychometric properties in the Spanish population, its psychometric properties have not been assessed in Latin American countries, which have very different labor market dynamics. This research aimed to analyze the psychometric characteristics of the CEBE with a sample of graduates from universities in Ecuador, with the aim of investigating reliability, factorial structure, and discrimination of the items. 395 graduates from a private university in Ecuador (66.3% female; M age = 33.26 years, SD = 8.53) participated. A cross-sectional instrumental design was used. Internal consistency was assessed using Cronbach's alpha and McDonald's omega; item discrimination using corrected item-total correlations; factor structure using exploratory factor analysis (EFA) with maximum-likelihood factor extraction and varimax rotation; and Confirmatory factor analysis (CFA) to determine the original factor structure. Internal consistency was excellent ($\alpha = .918$; $\omega = .920$). Eleven items with $DI < .30$ were dropped, leaving a 28-item version. EFA recommended that the total variance was explained by six factors ($KMO = .885$; Bartlett's test of sphericity $\chi^2 = 5806$, $df = 378$, $p < .001$). However, the original factor structure was poorly represented in this sample in CFA, with the following fit statistics: $CFI = .722$, $TLI = .697$, $SRMR = .0825$, $RMSEA = .107$ (90% CI = .102–.111). The CEBE demonstrated excellent internal reliability in the Ecuadorian population, but its factorial validity was only partially supported and was not confirmed by CFA. Exercising caution in career situations is advisable, and additional research is needed to further clarify the factor structure or to consider adapting the instrument to the local context. There is a need for further research, including alternative models (bifactor or six-factor models) and factorial invariance across countries.

Keywords: Job Search, Self-efficacy, Validation, Confirmatory Factor Analysis, Psychometrics, Ecuador.

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1. Introduction

Being jobless is not an inevitable consequence of adult life, as it affects not only the economy but also the emotional and social lives of people (da Motta Veiga et al., 2021). In the contemporary, globalized world, people feel compelled to adapt to a society brimming with technology. These conditions have become increasingly challenging, requiring new skills and strategies for those who are jobless or seeking to improve their current employment status. Beyond job-seeking, the entire employability landscape has been transformed by information technologies and data-based tools. Recent research has explored new ways of utilizing online job postings such as labor-market intelligence Tzimas et al. (2024), stated that, new approaches to using AI to recommend occupations based on personality types Sarsenbay et al. (2025), examine that, and new ideas for using LBS based on learning to match candidates with occupations based on skills (Alsaif et al., 2022). Meanwhile, concerns have been raised about algorithmic biases in AI-automated hiring practices Albaroudi et al. (2024), stated that, and the possible use of generative AI, like ChatGPT, to increase job-seeking confidence and work-readiness (Xiao & Zheng, 2025).

The evolution of these conditions reflects the heightened complexity of the situation in which today's job seekers are working and highlights the importance of tools for measuring individual differences across the job search process that respect the psychological dimensions. The role that a psychological variable can play in shaping the thoughts and actions of those entering the labor market has proven significant throughout the job search process (Meyers & Houssemand, 2010). With this lens, a scientific focus has emerged on engaging positive psychological resources that impact mental health and well-being. Previous findings demonstrate that individuals with high levels of optimism and hope, self-efficacy, and resilience are more likely to secure employment (Georgiou et al., 2012). Having these positive attributes makes individuals more resilient to change and more likely to adopt alternative strategies for seeking employment that align with their occupations (Chen & Lim, 2012). The belief that one has the ability to perform the activities of job searching successfully is what we call job search self-efficacy—and this is the dimension of the construct that has drawn most research interest, as the positive effect of this construct on job searching motivation, effort expended, and perseverance in the event of rejection indicates that it is a multidimensional entity (Saks et al., 2015).

Similarly, skills assessment practices among employers have been emphasized as tools that help prepare recent graduates for employment (Gabor et al., 2019), while preparatory behavior among undergraduate students has been shown to be hindered by anxiety about their jobs (Kim et al., 2022). Social factors have also been found to be relevant predictors of job search outcomes (Martínez-Clares & González-Lorente, 2021). Of these, gender is one variable that has been well studied: men have been found to be more passive when applying for jobs than women, and this factor may be relevant for predicting gender-specific unemployment rates (Fernández-Valera et al., 2023). Another strong factor is age: young adults living at home have a reduced likelihood of holding a job, and economic support from their family home can lead an adult to delay a job search – perhaps seeing less urgency – which can hinder career development (Saydam & Raley, 2024). People from specific demographics (e.g., refugees) might face additional challenges in accessing the self-efficacy needed to pursue their career search, but career-adaptability interventions targeted to this group could bolster these groups' self-efficacy perceptions related to work and job search (Morici et al., 2022).

Further findings from other studies highlight that vulnerable situations at the social level and in the labor market lead to limited access to employment opportunities and lower development of basic competencies. Income constraints also result in less access to modern digital tools that facilitate a successful job search (Van Hemelryck & Morales, 2022). Similarly, the labor market in Latin America has changed significantly amid economic uncertainty, exacerbated by the pandemic, external indebtedness, climate change, inflation, and other factors in recent years. These aspects notably influence how individuals search for employment and the opportunities society can generate. The Ecuadorian labor market has specific features that make it different from other contexts: informality is around 47% of the employed population, there is a wide disparity between the urban and rural labor markets, and gender and educational differences manifest themselves in a large way in the labor market (López Alba & Botello Peñaloza, 2022). These conditions could impact how people perceive and undertake searching for work and require validated instruments that allow for adequate perception and representation of these realities.

Several theoretical approaches have been used in the analysis of the variables that are part and parcel of the job search process of which two are pertinent to this study. The Theory of Planned Behavior (Ajzen, 1991) focuses upon the motivational function of job search behavior—namely, job search is possible when an individual has a positive attitude toward job searching, and the perception of social norms rates personal intention particularly when the social support is from a close environment like families or friends. Self-efficacy is another aspect of this theory that pointed out the role of beliefs and actions in job search and how beliefs drive more active job search strategies. The social cognitive career theory (SCT) constructed by social cognitive model of career self-management Lent and Brown (2013), stated that, suggests a strong interaction between the cognitive factors and the formation of the outcome expectancies and personal goals. Cognitive flexibility, which is a feature of career self-management, influences the changes in behavior when pursuing a career; during job search, cognitive flexibility enables the adjustment to change, which helps individuals to be more adaptable with strategy changes and more responsive to job experiences that appear different than their expectations (Roux et al., 2025). Psychological factors, as shown in the literature, have been essential when writing instruments that study the many aspects of motivation, behavior, and cognition in job search (Carrein-Lerouge et al., 2021; Hernández-Fernaud et al., 2011). There are multiple scales that can be used to capture aspects of job search. The measurement of self-efficacy behaviors and outcomes for job search were done using a 20-item job search self-efficacy scale with very high reliability coefficients ranging from .89 to .96 (Teye-Kwadio, 2021).

An adaptation for individuals in an active job search process, with a Cronbach's alpha of .82, was designed and is often used in career counselling contexts (Petruzziello et al., 2020; Wanberg et al., 2010). A Spanish-context job searches self-efficacy scale is a Likert-type scale, where participants rate their confidence in job search activities (Hernández-Fernaud et al., 2011). The Work Self-Efficacy Scale, which consisted of 12 items, showed four factors in its factor structure: coping with frustration, entrepreneurial exploration, proactive career planning, and relational integration (Pepe et al., 2010). Instruments have also been adapted to other European settings, for instance, the French version of an employability questionnaire (Carrein-Lerouge et al., 2021). Job search behavior is also linked with overall labor outcomes like job satisfaction and labor well-being, which has been analyzed in various occupation categories, including garment workers in developing countries Yuan et al. (2022), examine that, well-qualified workers Montuori et al. (2022), stated that, and

labour subjected to job demands, control and identification pressures (Fernández-Salineró et al., 2026). Less abstract links have been found between soft skills and the level of attainment of the university graduates in general Ramos-Pulido et al. (2023), stated that, and between authentic assessment methods based on group work and the development of job readiness among project-management graduates specifically (Tumpa et al., 2022).

Complementary qualitative studies have also examined students' attitudes towards preparation for work in the humanities Jang and Lee (2025), indicating that, students' attitudes towards work preparation in the humanities are influenced by two factors: their psychological characteristics and the context of their major. Based on this literature, and because most of the instruments currently available measure cognitive abilities or behavior separately, an instrument that combines both into a single questionnaire, namely the Job Search Assessment Questionnaire (Cuestionario de Evaluación de la Búsqueda de Empleo, CEBE), was created. Combines constructs like self-efficacy, information, and skills under one instrument in three subscales: Insertion Facilitating System, Job Search Behaviors scale (frequency of job search techniques and degree of organization and planning in the search), and Motivated Job Search Behaviors scale (positive expectations: self-efficacy, chances, internal locus of control, and proactive behaviors). This instrument has not been validated in Ecuador but in some dimensions is very relevant due to the need of a tool adapted to the needs of Ecuadorian professionals which can facilitate the process of insertion of Ecuadorian workers. Before using instruments in new contexts, there is a need to cross-culturally validate instruments. In addition, there are important differences in job search patterns between countries, reflecting country-specific socio-economic, cultural and structural dynamics that affect the extent to which people learn how to search for jobs and their motivation to do so. This concern is valid and, in the context of the current pandemic, a recent validation of a skills-and-attitudes for Job Seekers (JS) instrument for Colombia resulted in a factor structure that was different from the original Spanish studies Fontalvo Herrera et al. (2023), stated that, which strengthens the idea that instruments developed in one cultural context do not necessarily transfer to another.

The present validation is not intended as a simple national replication. There are significant differences in the structural and psychological environments that shape a worker's approach to seeking employment: Ecuador's labor market features a high proportion of informal employment (about 47% of all workers), underpinned by high rates of urban-rural inequality, and a robust personal and family network for gaining access to employment that is typically contrasted with formal pathways (López Alba & Botello Peñaloza, 2022); in comparison, the Spanish labor market is structured and governed within a more formalized, EU-related employment framework that offers comparatively high levels of formal job search infrastructure and is characterized by a relatively low level of informality. The potential effect on the psychological significance of constructs of job-specific self-efficacy, proactivity, and planning – indicators of adaptive self-efficacy behaviors in a formal sector job search – can plausibly differ from job search behaviors in an informal/blended sector job search, where perseverance and interpersonal effort are more important. In this regard, a factorial structure developed and validated in Spain cannot be considered fully valid for Ecuador, since the items' covariance structure depends on the socio-economic context in which participants interpret and perform their job search. However, the present study not only provides the first evidence of psychometric validity of the CEBE in the Ecuadorian context, but it also empirically suggests that the factor structure is not directly replicable from a high-formality European labor market context to

the high-informality labor market context of Latin American countries, and that it identifies the specific items and dimensions that do not easily translate. This presents a cross-cultural validation for the “Latin American” case, which extends the previous work in this field, originally done in Latin America (such as Fontalvo Herrera et al., 2023, for Colombia) and in Spain/Italy (such as Pepe et al., 2010), adding a case study from a country with high levels of informality, and provides a substantive argument for the basis on which culturally embedded aspects of the labor-market system – rather than just translation or wording – limit the portability of measures related to job search.

There is little research on the Ecuadorian labor market or the psychological processes involved in the search for work, and this is a topic of particular interest to students. The CEBE would be a valuable resource in future research and would help inform the design of more effective career counseling and programs for those without work. Hence, the main goal of this research was to determine the psychometric characteristics of the Job Search Assessment Questionnaire (CEBE) for Ecuadorian university graduates as professionals.

In particular, the following objectives were set: (1) evaluate the internal consistency or reliability of the CEBE using Cronbach’s alpha and McDonald’s omega coefficients. (2) Analyze the discrimination index for each item and eliminate those with poor values. (3) Explore the factor structure of the instrument in the Ecuadorian context through exploratory factor analysis. (4) Confirm the three-factor structure of the instrument reported in previous studies through confirmatory factor analysis. (5) Provide recommendations for the use of the CEBE in the Ecuadorian context based on the emerging psychometric evidence. Based on the hypothesis, it was assumed that the CEBE would have acceptable internal consistency (α and $\omega > .80$). However, there were few cross-cultural studies of job search between these two countries (Spain and Ecuador), so no specific hypothesis was posited regarding the replicability of the factor structure, leaving room for an exploratory approach.

2. Materials and Methods

The study is descriptive and instrumental, as it does not attempt to manipulate variables or make causal statements; it focuses on the psychometric properties of the Job Search Assessment Questionnaire (CEBE). This was a cross-sectional study (data were collected at a single point in time). A sample of 395 professionals who graduated from a private university in Ecuador was selected. Of the total, 262 were women (66.3%) and 133 were men (33.7%), with a mean age of 33.26 years ($SD = 8.533$; range = 22–59 years). The participants had completed their academic studies in different fields. The majority of graduates were from the Faculty of Social Sciences, Education and Humanities (54.2%, $N=214$), Faculty of Economic and Business Sciences (25.8 %, $N=102$), Faculty of Exact and Natural Sciences (11.6 %, $N=46$), Faculty of Engineering and Architecture (6.6 %, $N=26$), and Faculty of Health Sciences (1.8 %, $N=7$). Regarding employment status, most participants indicated that they were unemployed at the time of the study (53.4%, $N=211$), and the rest were employed (46.6%, $N=184$). Data on the postgraduate period were not obtained, which is a limitation that will be discussed later in this manuscript. We employed a non-probabilistic convenient sampling technique (Otzen & Manterola, 2017), where participants were invited to respond to a call for participation during an employability skills training programme. No exclusion criteria were defined, other than that participants had to have graduated from the university involved in this study, be registered in the employment workshop, and voluntarily participate.

The sample size ($N=395$) comfortably exceeded the criterion of at least ten participants per item for the standard recommendations of factor analysis ($N/\text{items} = 395/39 = 10.1$). The Job Search Assessment Questionnaire (CEBE) assesses a range of aspects related to behaviors and attitudes that affect job searching. The scale comprises 39 items across three subscales. Items in the first subscale, the Insertion Facilitating System, were rated on a five-point Likert scale (1 = “strongly disagree” to 5 = “strongly agree”) and assessed four interrelated components. These include information about the labor market/labour selection process (e.g., “I have all information I need to obtain a job”), planning of the search (e.g., “I regularly organise my job search”), technical job search skills (e.g., “I have mastered job search techniques: resume, interviews, Internet”), and motivation to search for work (e.g., “I feel very motivated to look for work”). The Cronbach’s alpha for this subscale in the original version was .87. The second subscale (Job Search Behaviors) has 14 items, ten of which are measured on a four-point scale using different job search techniques with frequencies ranging from “occasionally” (1) to “daily” (4); the remaining four items are measured on a four-point scale ranging from “never” (1) to “always” (4) and involve organization and planning of the search. The original reliability of this subscale was .91. The third subscale comprised 20 items with a nine-point Likert response style (1 = “strongly disagree” to 9 = “strongly agree”) around two factors: positive expectations for job search (Satisfaction Expectancies, Internal Locus of Control, and Self-efficacy) and proactive behaviors (preferring to approach companies rather than waiting for them to approach, reviewing and modifying approach to search for employment to find better opportunities). The original Cronbach’s alpha for this subscale was .91. As the instrument was originally designed in Spanish for the Spanish-speaking population, no grammatical change was made in the items; however, it was considered that the word used was proper for the Ecuadorian population. Sociodemographic information, such as ‘age’, ‘sex’, ‘faculty of origin, and ‘working status (employed or unemployed), was collected from a short ad hoc questionnaire apart from CEBE.

The CEBE was psychometrically validated in five stages. First, an institutional contact was made with the Universidad Técnica Particular de Loja (UTPL), one of the best private universities in Ecuador. This university regularly organizes career counseling workshops for recently graduated students. Second, a virtual workshop called ‘Socio-emotional skills for employability’ involving three hours of instruction on self-efficacy, resilience, and search for a job in the digital era was held, and open participation in the workshop invited research participants. Third, the instrument was administered: Participants who consented to participate completed the questionnaire via a link sent online through the SurveyMonkey platform, which was self-administered and, on average, took 15-20 minutes to complete. Fourth, ethical issues were dealt with; the data collection was anonymous, following ethical principles as would be expected in research with human subjects, including the following: at the beginning of the questionnaire, the participant was told of the objectives of the study, that his participation was voluntary, that he could withdraw at any time without risk of reprisal from the research staff or university, and that his responses would be kept confidential. Fifth, the data were exported from SurveyMonkey to a CSV file, anonymized, and duplicate and incomplete data were checked.

An open-source statistical environment, namely JAMOV (version 2.4.6), was used for analyses. The scores of the three questionnaires were first standardized to a T score with a mean of 50 and a standard deviation of 10 before reliability analysis. This conversion enabled comparisons with other instruments that have different response scales. The

discrimination index, which calculates the extent to which an item discriminates between the two groups, was used to purify the items. The discrimination index was defined as the Pearson correlation between the item score and the total scale score with that item's score removed. Items with a discrimination index below .30 were considered for removal. This purification took place in three stages. In each phase, the item with the lowest discrimination index was discarded. Other discrimination indices were recalculated after item deletion. This was repeated until none of the indices fell below .30. Cronbach's alpha and McDonald's Omega coefficients were used to measure the reliability of the purified scale. The maximum likelihood method was used to estimate the value of McDonald's omega. Reliability was considered acceptable at .70 or above, good at .80 or above, and excellent at .90 or above. Data on the scale's internal structure were analyzed using exploratory factor analysis. The data were treated as normally distributed, and maximum likelihood extraction was used. To aid interpretation of the extracted factors, varimax orthogonal rotation was performed. The appropriateness of the correlation matrix was checked prior to exploratory factor analysis. Bartlett's sphericity test had to be statistically significant ($p < .05$). The Kaiser-Meyer-Olkin (KMO) measure was also examined. Generally acceptable, good, and excellent values were considered to be KMO of .70, .80, and .90, respectively. The criteria for retaining the number of factors were based on eigenvalues of 1 and the scree plot.

Confirmatory factor analysis was then conducted to test the CEBE's original three-factor structure. To address potential non-normality, robust maximum-likelihood estimates were employed to yield more conservative estimates. Several goodness-of-fit indices were used to assess model fit. The Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) were among these. CFI values of .90 or above were considered to indicate acceptable fit, and values of .95 or above were considered to indicate excellent fit. RMSEA values of .08 or lower were deemed acceptable, and values of .05 or lower were deemed excellent. The RMSEA was also presented with the 90% confidence intervals. SRMR values of .08 or lower were deemed acceptable. Standardized factor loadings are also discussed. Loadings of .40 or above were deemed acceptable, and the statistical significance of their scores was confirmed at a p-value of less than .05 (Hair et al., 2019).

Conducting both EFA and CFA on the same sample ($N=395$) was not the preferred design but a practical limitation. Recruiting only for an institutional employability workshop would have produced a sample of fewer than 200 cases, which is below the recommended threshold for stable CFA estimation, especially given the size of the model (39 original and 28 purified items). A split-sample methodology could have introduced additional analytical instability in both steps of the analysis. Therefore, a strong exploratory analysis of the entire sample was preferred, especially because no factor structure from previous Ecuadorian analyses was available to confirm. Given this design specification, the CFA results reported in this study are only an internal cross-validation test, not original confirmatory test results in the strict vein of psychometrics. Notably, the poor model fit represents a conservative result. Therefore, the low fit of the CFA has to be attributed to something other than the use of the same sample for EFA.

3. Results and Discussion

All results are presented in Table 1, which reports reliability and item-discrimination

statistics. The final scale comprised 28 items, derived by progressively purifying the initial 39-item scale and removing items with a discrimination index below .30. Scores from each of the three questionnaires were converted to T scores ($M = 50$, $SD = 10$) before calculating reliability values. Overall scale internal consistency was excellent, with Cronbach's $\alpha = .918$ (95% CI = .905–.930) and McDonald's $\omega = .920$. The range of item-total correlations was moderate to high (.313 to .697), with an average of .513. A quality check for each item, followed by progressive elimination, resulted in the removal of 11 items (4.2% of the original 28 items), which marginally increased the overall reliability coefficients but did not significantly improve internal consistency among the items.

Table 1: Reliability and Item-Discrimination Statistics for the Final 28-Item Version of the CEBE.

Item	Abbreviated Content	Corrected Item-Total Correlation (ID)	Cronbach's Alpha if Item Deleted	McDonald's Omega if Item Deleted
SIFI_T1	I have all the information I need	.435	.917	.918
SIFI_T2	I regularly organize myself	.495	.916	.918
SIFI_T3	I have mastered job search techniques	.485	.916	.918
SIFI_T4	I feel very motivated	.376	.918	.919
SIFI_T5	I believe I will find a job soon	.419	.917	.919
ICBE_T6	[Behavioral item]	.337	.918	.920
ICBE_T7	[Behavioral item]	.313	.919	.920
ICBE_T8	I apply to private companies	.476	.916	.918
ICBE_T9	[Behavioral item]	.485	.916	.918
COMOBE_T10	I have hopes of being hired	.600	.914	.916
COMOBE_T11	I trust my abilities	.547	.915	.916
COMOBE_T12	Finding a job depends on me	.633	.914	.915
COMOBE_T13	[Expectancy item]	.513	.916	.917
COMOBE_T14	I can behave appropriately in an interview	.568	.915	.916
COMOBE_T15	I look for work in different positions	.507	.916	.917
COMOBE_T16	Many possibilities of a good job	.588	.914	.916
COMOBE_T17	I review and modify my search approach	.601	.914	.916
COMOBE_T18	Finding a job depends on time invested	.615	.914	.915
COMOBE_T19	I imagine myself working in different places	.632	.914	.915
COMOBE_T20	I offer myself even when not hiring	.697	.913	.914
COMOBE_T21	[Proactivity item]	.458	.916	.918
COMOBE_T22	[Self-efficacy item]	.586	.914	.916
COMOBE_T23	[Expectancy item]	.374	.918	.919
COMOBE_T24	[Proactivity item]	.569	.915	.916
COMOBE_T25	[Self-efficacy item]	.650	.913	.915
COMOBE_T26	[Locus-of-control item]	.548	.915	.916
COMOBE_T27	[Motivation item]	.434	.917	.918
COMOBE_T28	[Perseverance item]	.418	.917	.919

Note. SIFI = Insertion Facilitating System; ICBE = Job Search Behaviors; COMOBE = Motivated Job Search Behaviors. Items marked with bracketed descriptions correspond to items whose original wording was not provided in the base manuscript.

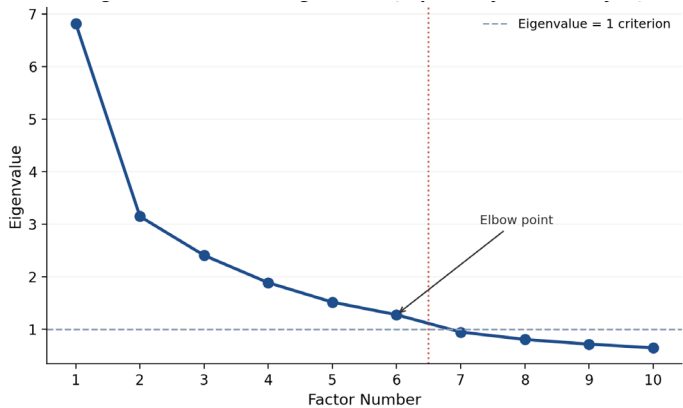
An initial check of the data matrix's suitability for EFA was conducted (Table 2). Bartlett's test of sphericity showed a significant relationship among the variables ($\chi^2 = 5806$, $df = 378$, $p < .001$), supporting the use of multivariate analysis. The overall Kaiser-Meyer-Olkin index was 0.885, which can be considered "good". The results met the criterion for the data to be appropriate for exploratory factor analysis.

Table 2: Kaiser-Meyer-Olkin and Bartlett’s Test of Sphericity.

Measure	Value
Kaiser-Meyer-Olkin (KMO) Measure	0.885
Bartlett’s Test of Sphericity — Chi-square	5806
Bartlett’s Test of Sphericity — df	378
Bartlett’s Test of Sphericity — p	< .001

Note. The KMO test was highly significant ($p < .001$).

Figure 1: Scree Plot of Eigenvalues (Exploratory factor analysis).



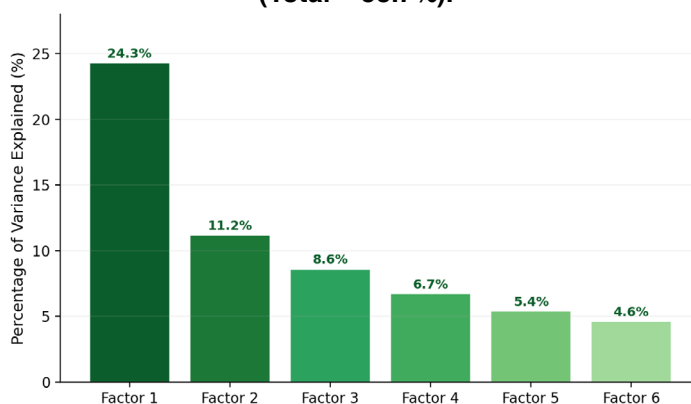
The 28 purified items were used in exploratory factor analysis. Based on the eigenvalue greater than 1 criterion, six factors were obtained, accounting for 53.7% of the total variance, with eigenvalues of 6.82, 3.15, 2.41, 1.89, 1.52, and 1.28, respectively. The scree plot (Figure 1) confirms these factors: after the 6th factor, the graph shows no point of inflection, so the first 6 factors are deemed the most meaningful, as they explain the most variance.

The varimax-rotated factor loadings are reported in Table 3 (loadings < .3 were omitted for simplicity). Factor 1 has seven items, all from the Motivated Job Search Behaviors subscale, with loadings between .502 and .716, and accounts for 24.3% of the variance. Optimism about being able to find a job soon (Factor 2; Introduction Facilitating System), along with four items from Motivated Job Search Behaviors, accounts for 11.2% of the variance. The five items of Factor 3 (3 Job Search Behaviors, 2 Motivated Job Search Behaviors - all loadings above .89) show particularly high loadings concentrated on job search behavior, with especially high loadings on the planning items (.847 and .894), contributing 8.6% of the variance. Factor 4 consists of 6 items explaining 6.7% of the variance and clusters around self-efficacy for job-search behaviors more generally (interview-related self-efficacy and proactivity or job-search efforts), with loadings ranging from .350 to .684. Factor 5, information, organization, mastery of techniques, and motivation, which is made up of the remaining four Insertion Facilitating System items, accounts for 5.4% of the variance. Factor 6 is made up of one measure, ‘I can afford to stick with the inconveniences of looking for work,’ and has an extremely high loading (0.818) and low uniqueness (0.080), accounting for 4.6% of the variance. For comparison, Figure 2 shows the percentage of variance explained by each of the 6 factors.

Table 3: Exploratory Factor Analysis with Varimax Rotation (Factor Loadings).

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Uniqueness
COMOBE_T8	.716					.325	.298
COMOBE_T9	.637						.458
COMOBE_T18	.612						.456
COMOBE_T12	.561						.611
COMOBE_T7	.541						.516
COMOBE_T3	.513						.529
COMOBE_T5	.502						.527
COMOBE_T16		.783					.221
COMOBE_T4		.731					.351
SIFI_T5		.588					.345
COMOBE_T6		.551					.517
COMOBE_T10		.518					.396
ICBE_T12			.894				.114
ICBE_T11			.847				.200
ICBE_T5			.559				.651
ICBE_T8			.417				.794
COMOBE_T20			.393				.739
COMOBE_T14				.684			.381
COMOBE_T11				.650			.269
COMOBE_T15				.492			.689
COMOBE_T1				.470			.503
COMOBE_T17				.457			.478
COMOBE_T19				.350			.753
SIFI_T3					.750		.354
SIFI_T2					.687		.387
SIFI_T1					.621		.543
SIFI_T4					.443		.721
COMOBE_T2						.818	.080

Note. Extraction method: maximum likelihood; rotation method: varimax with Kaiser normalization. Factor loadings below .30 are not shown. COMOBE = Motivated Job Search Behaviors; SIFI = Insertion Facilitating System; ICBE = Job Search Behaviors.

Figure 2: Variance Explained by Each Factor in the Six-Factor EFA Solution (Total = 53.7%).

Some items have higher uniqueness values (>0.60), such as ICBE_T5 (0.651), ICBE_T8 (0.794), COMOBE_T12 (0.611), COMOBE_T19 (0.753), SIFI_T4 (0.721),

and COMOBE_T20 (0.739), indicating that these items account for more than 60% of the variance that is not common across the factors. This suggests that these items warrant further investigation and that confirmatory factor analysis is needed to confirm the measured structure. Figure 3 illustrates the 6-factor schema of the Motivated Job Search Behaviors as represented in this model, particularly the fact that this subscale is divided into several more specific factors.

To test the three-factor structure of the original six-factor EFA model, the six-factor EFA model itself was not tested. Instead, a confirmatory factor analysis model was tested, specifying three correlated latent factors: Insertion Facilitating System (5 items), Job Search Behaviors (4 items), and Motivated Job Search Behaviors (19 items). The results are shown in Table 4 and Figure 4. Factor loadings on each item were statistically significant ($p<.001$), with maximum standardized loadings of .956 and minimum loadings of .364, indicating that most items loaded considerably onto the corresponding factor. However, four items had loadings below the 40% threshold and could be considered for revision or elimination in later forms of the instrument: ICBE_T8 (.413), COMOBE_T15 (.379), COMOBE_T19 (.427), and COMOBE_T20 (.364).

Figure 3: Six-Factor Structure Identified in the Exploratory Factor Analysis (Varimax Rotation; 53.7% of Total Variance Explained).

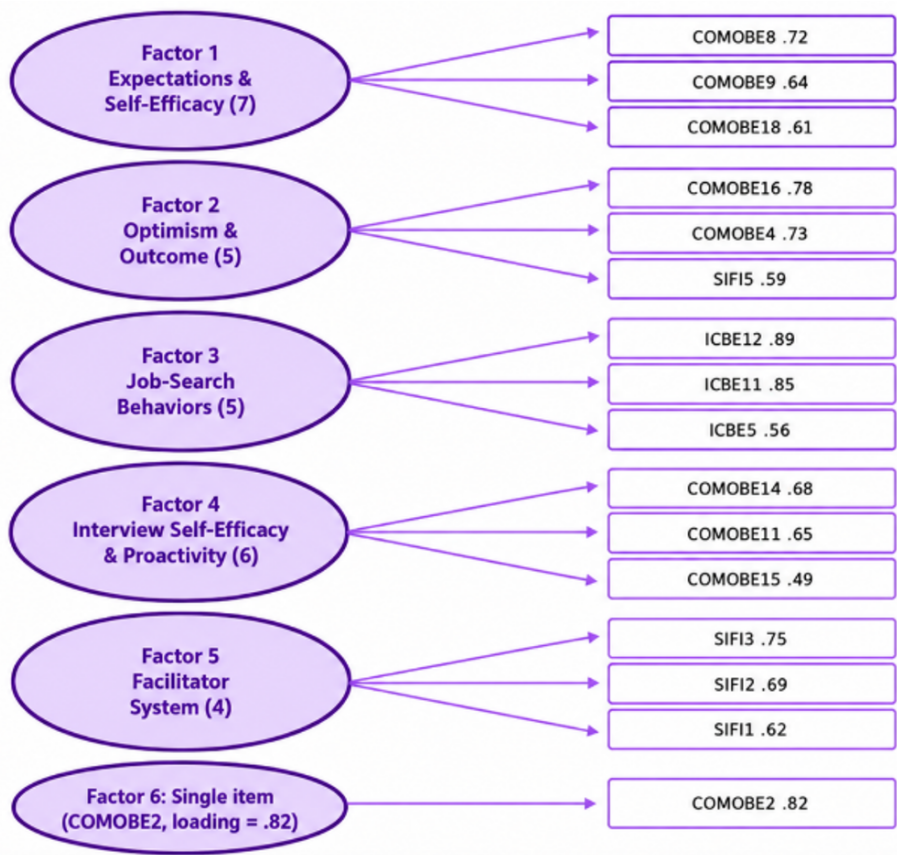
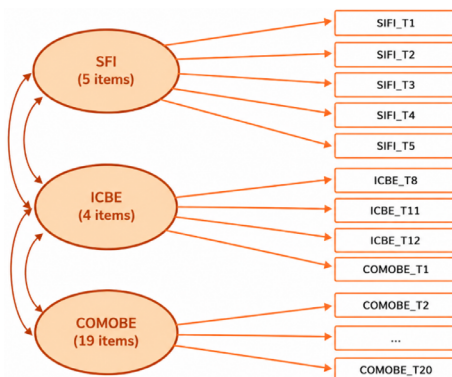


Table 4: Confirmatory Factor Analysis of the Original Three-Factor Model.

Factor / Indicator	Unstandardized Estimate	SE	z	p	Standardized Loading
Factor 1 (SFI)					
SIFI_T1: I have all the information	6.71	0.497	13.49	< .001	.655
SIFI_T2: I regularly organize myself	7.38	0.462	15.97	< .001	.746
SIFI_T3: I have mastered techniques	8.16	0.456	17.89	< .001	.812
SIFI_T4: I feel very motivated	5.02	0.523	9.60	< .001	.497
SIFI_T5: I believe I will find a job soon	5.32	0.503	10.58	< .001	.543
Factor 2 (ICBE)					
ICBE_T5: I submit or send my resume	5.73	0.481	11.91	< .001	.567
ICBE_T8: I apply to private companies	4.17	0.502	8.30	< .001	.413
ICBE_T11: I use a planner	9.07	0.418	21.72	< .001	.888
ICBE_T12: I plan my search in advance	9.75	0.401	24.31	< .001	.956
Factor 3 (COMOBE) – Extremes and Representative Items Shown					
COMOBE_T1: Anticipating required skills	6.50	0.464	14.00	< .001	.647
COMOBE_T2: I can tolerate setbacks	6.43	0.474	13.56	< .001	.631
COMOBE_T3: I prefer to make myself known	6.30	0.473	13.32	< .001	.622
COMOBE_T4: I will be unemployed briefly	5.51	0.479	11.50	< .001	.554
COMOBE_T5: I can anticipate what is expected	6.01	0.474	12.67	< .001	.598
COMOBE_T6: More effort, more opportunities	5.81	0.474	12.25	< .001	.583
COMOBE_T7: One must take the initiative	6.78	0.463	14.66	< .001	.670
COMOBE_T8: Capable of overcoming rejection	6.75	0.454	14.88	< .001	.679
COMOBE_T9: I like to imagine the process	6.76	0.459	14.73	< .001	.673
COMOBE_T10: I have great hopes	7.12	0.455	15.64	< .001	.705
COMOBE_T11: I trust my abilities	7.82	0.431	18.14	< .001	.782
COMOBE_T12: Finding a job depends on me	5.40	0.490	11.03	< .001	.533
COMOBE_T14: Behave appropriately in interview	6.64	0.464	14.31	< .001	.659
COMOBE_T15: Search in different positions	3.87	0.515	7.52	< .001	.379
COMOBE_T16: Many possibilities of good job	6.45	0.469	13.74	< .001	.640
COMOBE_T17: Review and modify approach	6.74	0.460	14.65	< .001	.670
COMOBE_T18: Depends on time invested	6.43	0.468	13.73	< .001	.638
COMOBE_T19: Imagine working in different places	4.33	0.505	8.57	< .001	.427
COMOBE_T20: Offer myself even without hiring	3.53	0.490	7.19	< .001	.364

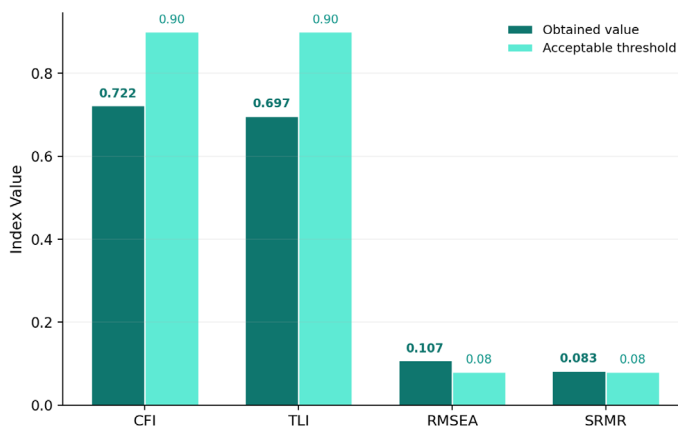
Note. SE = Standard Error; SFI = Insertion Facilitating System; ICBE = Job Search Behaviors; COMOBE = Motivated Job Search Behaviors.

Figure 4: Confirmatory Factor Analysis: Original Three-Factor Model Model
Fit Indices: CFI = 0.722, TLI = 0.697, RMSEA = 0.107, SRMR = 0.0825.



The overall model fit indices were as follows: $\chi^2(347) = 1905$, $p < .001$; CFI = .722; TLI = .697; SRMR = .0825; RMSEA = .107 (90% CI = .102–.111). These indices indicate that the original three-factor model is not a good fit for the Ecuadorian sample, suggesting that a three-factor solution is insufficient. The CFI and TLI are considerably below the minimum value of .90, the RMSEA is well above the bounds of its confidence interval (.08–.102) and exceeds the recommended level of .08, and the SRMR is marginally above the recommended value of .08. Each fit index was compared to its conventional acceptability limit, and the resulting visual comparison is presented in Figure 5 as the magnitude of the misfit. Although the factor loadings were all statistically significant (suggesting convergent validity of the items with the factors they belong to), the overall fit of the model was not satisfactory. This could suggest that the original 3-factor structure is not fully replicated in this sample of data, which is a central component of the interpretation of the present results.

Figure 5: Confirmatory Factor Analysis Fit Indices Compared with Conventional Acceptability Thresholds (Three-Factor Model).



These findings accomplish the primary goal of the present study, which was to meet the need to validate the CEBE through a thorough psychometric evaluation and analysis that included item discrimination, exploratory factor analysis, and confirmatory factor analysis. The present validation is particularly important because, after a thorough search of the scientific literature, no previous research has used or adapted this instrument for an Ecuadorian or wider Latin American population. Regarding reliability, the results showed that the instrument was internally consistent, with an α of .918 and ω of .920. These values are slightly higher than the alpha values for the original Spanish sample (ranging from .87 to .91), indicating the level of homogeneity of the items and that this instrument can be applied to other cultures. Other validation studies of job search instruments in different cultural contexts have yielded similar findings (Hernández-Fernaudo et al., 2011; Petruzzello et al., 2020; Teye-Kwadio, 2021). However, a very high internal consistency coefficient ($\alpha > .90$) may also indicate item redundancy. The mean item-total correlation for this case (.513) falls within a reasonable range on the inter-item correlation scale but is not at a level that would be at the extreme end of redundancy (above .80), as one item was eliminated, which

may have minimized any redundancy within the original test. One of the interesting findings in the reliability of the items was that 28.2% of the total number (11) of the items were dropped because of their low discrimination index. This elimination rate is significantly higher than that seen in a successful validation and indicates that a local adaptation of the original CEBE may be preferable to its direct application. Items eliminated were all three subscales but mostly isolated to the Motivated Job Search Behaviors subscale, with seven items eliminated. In Ecuador, some of these activities, such as considering offering oneself to an employer who is no longer recruiting or imagining oneself working elsewhere and doing other jobs, may be interpreted differently culturally. Volunteering for work without a specific vacancy posted might be more common—or seen as inappropriate — in different industry sectors, especially in contexts of high labor informality.

In the future, qualitative studies using cognitive interviews as a research method could be conducted to understand why these items do not discriminate well in the Ecuadorian population. Exploratory factor analysis revealed a 6-factor structure, although the original model suggested three factors. The 53.7% explained variance is acceptable but not excellent in the Social Sciences (Hair et al., 2019). In the Ecuadorian sample, the factors of information, planning, skills, self-efficacy, and motivation were more differentiated than in the first published Spanish sample, which had only five factors. Notably, the third EFA factor primarily grouped job search behavior items with very high loadings on planning-related items, making this dimension the most coherent. The fifth factor grouped the Insertion Facilitating System items with good loadings. The four factors indicate that the Motivated Job Search Behaviors scale may have multiple dimensions in the Ecuadorian context, involving positive expectations and general self-efficacy, optimism and outcome expectations, specific self-efficacy for job search related to proactive behaviors, and tolerance of frustration/setbacks. This breakdown of motivation and self-efficacy into more specific aspects is similar to the theoretical separation of general and task-specific self-efficacy and to the social cognitive career model, which separates self-efficacy expectations from outcome expectations (Lent & Brown, 2013).

The most important finding from this study is the confirmation analysis performed. The overall goodness-of-fit for the three-factor model was clearly poor, with the CFI well below acceptable values, a comparably low TLI, an RMSEA slightly above the .08 threshold, and an SRMR well above the .08 acceptable value. However, all factors were statistically significant, indicating 3- factor convergent validity. These values suggest that the original three- factor basis does not fully reflect the Ecuadorian sample. From a learning perspective, the results demonstrate the following: A factor structure problem exists, and the factor structure needs to be revised; whereas claims regarding factorial validity typically made about the instrument have a domain of validity. This lack of replicability may have several – not mutually exclusive – explanations. For one, cultural differences in the interpretation of items may exist: Ecuadorian culture has a high rate of labor informality López Alba and Botello Peñaloza (2022), stated that, personal networks that may be more important than formal search processes, and a more collectivist culture than the Spanish culture, which could mean that some items are interpreted differently, such as an item related to making oneself known to companies instead of waiting for such offers, depending on the sector. Second, consider the heterogeneity of the samples (reflecting the real- world heterogeneity of

graduates), which may have included graduates from very different academic disciplines, a broad range of ages, and a range of employment positions, which could have given rise to noise or cross-group differences in the way that items are related to the latent factors. Third, the item-purification procedure used was a psychometrically supported decision, but it may have sought to remove items important for the original factors, especially for the subscale, Motivated Job Search Behaviors (MJSB). The resulting 28-item version may therefore not be fully comparable to the original 39-item version.

The model obtained is not acceptable, with CFI = .722, TLI = .697, RMSEA = .107, and SRMR = .0825. These values fall below conventional thresholds for acceptable fit, including those provided by Hair et al. (2019), and do not meet any standard for acceptable MKCI. The non-equivalence between the Ecuadorian and Spanish samples (as concluded from the EFA) results in six factors instead of three and cannot be explained by a simple technical artifact. If anything, the same-sample EFA/CFA pipeline would tend to inflate fit. Practically, these findings indicate that the original three-subscale scoring of the CEBE (Insertion Facilitating System, Job Search Behaviors, and Motivated Job Search Behaviors) should not be used for individual diagnostic or career-counseling decisions in Ecuador until an adequately fitting structure is confirmed. In most cases, the total score composed of 28 purified items can be used descriptively as a general screening measure, and this has been made a specific practice recommendation. Cross-validation of existing data with a correlated 6-factor model or with a bifactor model is the next stage of analysis and is not something that is set to happen in the distant future, based on the 6-factor solution that was reported within the framework of this study.

The results, however, may have been influenced by common-method effects and sampling characteristics, as data were gathered at a single point in time (i.e., using self-report methods) and because participants were convenience sampled at an employability workshop, thereby limiting the generalizability of the study's results. These findings support the increasingly consistent evidence from other studies that job search instruments developed in the West, especially in Europe and North America, are not readily translatable to Latin American contexts. A validation study of a job seekers' skills-and-attitude instrument in Colombia also revealed differences in factor structure from the original Spanish validation (Fontalvo Herrera et al., 2023). Across national comparisons, the factor structure of the Work Self-Efficacy Scale has also differed in Spanish and Italian samples, highlighting the need for cross-cultural validation studies even for apparently similar European countries (Pepe et al., 2010). This parallel case study reinforces the finding that instrument adaptation is not necessarily warranted when moving from an instrument's cultural and economic context of origin to another (and generally will not be warranted), but this applies equally well to the technology-mediated context of employability described above in this manuscript, where an instrument designed for a different context, such as an automated job recommendation or matching system, will need to be recalibrated for translation and application elsewhere (Ramos-Pulido et al., 2023).

Before structural and mean comparisons between groups can be meaningful, configural, metric, and scalar invariance must be established (Byrne et al., 1989). Although configural invariance – the minimal requirement that the same pattern of factor-item associations exists across groups – was not tested directly because a comparable CFA dataset used in Spanish was not available for the Ecuadorian

sample, the poor fit of the Spanish-derived three-factor model in the Ecuadorian sample is consistent with a failure of configural invariance. This aligns with broader research showing that even cognitively and linguistically similar concepts, such as self-efficacy and proactivity, can be organized differently across cultural groups, reflecting different ways respondents cognitively or behaviorally perform those concepts (van de Vijver & Poortinga, 1997). According to international guidelines for test adaptation (International Test Commission, 2017), full adaptation cannot be ensured through linguistic (word-for-word) translation, which was the only aspect of testing applied to the CEBE when it was administered in Ecuador, and requires empirical evidence of structural equivalence, which was not found in this study with the original three-factor solution. The poor CFA fit is not a validation failure but rather cross-cultural evidence that highlights deficiencies: the CEBE, as currently worded and structured, falls short of the threshold of factorial equivalence required to apply it across countries, and the six-factor EFA solution points to that lack of equivalence concretely. A formal multi-group invariance study comparing matched samples from both ancient nations is a needed extension and the best way to directly determine whether the differences represent a true cultural difference in the construct or whether the items are non-invariant and need revision in the future.

4. Limitations and Future Research

The present study also has some limitations that could be addressed in future studies to draw more satisfactory conclusions from the findings and implications. Limited generalizability is possible because of the use of a non-probabilistic sampling technique and non-representativeness. A qualitative employment workshop was conducted with graduates of a single private university in Ecuador. It is difficult to generalize the results to the population of graduates of public universities, graduates in other parts of the country, or those from other socioeconomic backgrounds. Future studies should include a better sampling design, including stratified and diverse sample designs. Second, although the number of participants (N=395) is sufficient for a basic confirmatory factor analysis, it is not sufficiently large for follow-up multigroup invariance analyses (e.g., men and women, employed and unemployed participants), which require at least 200 participants per group. Third, the lack of external and convergent validity evidence stems from the fact that none of the other job search instruments administered were given a measure of convergent validity, nor were measures of external criteria such as time to job or job quality obtained. Future studies could use these measures. Fourth, the same sample was used in both the exploratory and confirmatory factor analyses; ideally, the sample should be split into half the items as exploratory tests and half as confirmatory tests to avoid overfitting (capitalizing on luck) from using the same sample, and a second sample should be collected for future research. Fifth, the design of the cross-sectional research is inherently self-reported and does not permit the evaluation of temporal stability (test-retest reliability). Self-report measures have social desirability characteristics that may impact items related to effort and persistence in the job search. Finally, data on the time since graduation were not gathered, which is an important consideration, as time since graduation may have an impact on self-efficacy and motivation. Participants in a workshop on socio-emotional skills for employability may be more motivated, proactive, and/or sensitive to the significance of the skills, which may have limited the range of

scores achieved and influenced the item-total correlations. Despite these drawbacks, there are some recommendations for future work that may be taken. Equivalent samples could be drawn in both countries, and a factorial invariance study is recommended to determine the identity of the items exhibiting differential functioning across countries, thus providing ammunition for a thorough cultural adaptation process of the instrument.

The exploratory analysis indicated that there may be more than six factors; therefore, alternative models, such as a correlated six-factor model similar to the EFA solution, a bifactor model (one general job search factor and six specific factors), and a second-order model (three first-order factors loading onto a general factor), should be tested in future research. Often, the bifactor model may provide the best fit when a general factor is strong (Rodríguez et al., 2016). To fully establish the factor structure, it is also necessary to validate the instrument with independent samples of Ecuadorian graduates using Structural Equation Modeling (SEM), to test for convergent validity alongside other existing scales, and to test for predictive validity with longitudinal designs. Cognitive interviews with a small number of Ecuadorian graduate students might help identify a range of possible definitions, determine whether any terms are ambiguous, and assess whether the hypothesized constructs are experienced. This level of temporal stability, assessed through a test–retest reliability study in which the CEBE would be administered twice at intervals of two to four weeks, would be useful for confirmation and could be done as part of the present study. Future studies should also investigate the contextual conditioning of the CEBE factors across sex, age group, employment, and academic field, as well as compare digital and paper administration formats, especially in scenarios that feature a digital divide. In addition to this instrument, technological shifts in job search and career assistance offer other avenues that could be incorporated into future Ecuadorian studies.

As AI tools now feature in the job-matching process (e.g., job recommendation systems; Sarsenbay et al., 2025) or in access to skills-matching platforms (Alsaif et al., 2022), future uses of the CEBE should consider the effects of exposure to this technology and the psychological constructs the instrument is meant to capture, while also keeping in mind the algorithmic bias issues highlighted in the literature on automated hiring (Albaroudi et al., 2024) and their influence. In addition, access to labor market intelligence from online job postings (Tzimas et al., 2024) would enable triangulation of this survey's results with information available in Ecuador's job market at the time of the survey.

5. Conclusion

The Job Search Assessment Questionnaire (CEBE) shows fair-to-excellent internal consistency in a sample of Ecuadorian university graduates ($\alpha = .918$; $\omega = .920$), suggesting that the items on the scale share a common factor, namely, behaviors and attitudes toward job search. However, the factorial validity of the instrument was not fully confirmed in this study. Thus, the three- factor model has not been well replicated in the Ecuadorian sample, with poor model fit indices (CFI = .722, RMSEA = .107) in the CFM. Based on this, it can be argued that the factor structure in the Ecuadorian context may be subject to cultural, economic, and educational specificities, linked to the high level of informality and the strong regional disparity and segmented nature of the labor market. Three recommendations are offered, based on these findings. Professional use of the 28- item purified version of the CEBE is limited and should be

used with caution, preferably as a unidimensional measure (one total score) to derive information about general areas for improvement in job search; the three original subscale scores must not be used in isolation without additional evidence of factorial validity in this population. Future research should review different models (6- factor, bifactor, and second- order) with independent and more balanced samples, and a factorial invariance study between Spain and Ecuador should be conducted to identify items that present problems of differential functioning and to carry out a very good cultural adaptation. Items with low discrimination, high uniqueness, and low factor loadings should be revised, reworded, or eliminated for instrument development, and qualitative analyses such as cognitive interviews and focus groups should be conducted to gain a better understanding of how graduates from Ecuador interpret these instruments. The Ecuadorian version of the Job Search Assessment Questionnaire is currently a viable, although not fully factorially valid, instrument for the population studied. Based on the available data, it cannot be concluded that, in Ecuador, the CEBE differentiates its three original dimensions. It is hoped that the scientific and academic community will continue the process and, after making the appropriate adjustments, validate and adapt this instrument into one of the greatest instruments for career counseling and employability research in Latin America.

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