“University students’ readiness for the knowledge-based economy: Rethinking the strategic role of higher education”

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UNIVERSITY STUDENTS' READINESS FOR THE KNOWLEDGE-BASED ECONOMY: RETHINKING THE STRATEGIC ROLE OF HIGHER EDUCATION

Abstract

The knowledge-based economy refers to an economic model in which knowledge, human capital, innovation, digital capabilities, and the transformation of information into productive value become central drivers of competitiveness, employability, and sustainable development. This study investigates university students' preparedness for the knowledge-based economy by empirically validating theoretical constructs and their association with perceived professional readiness. A quantitative, non-experimental, descriptive, and explanatory approach was adopted. The survey was conducted between June and August 2025 at the Faculty of Accounting and Auditing of the Technical University of Ambato, Ecuador, a public university with strong academic relevance in the country's central region, located in a city whose business sector is undergoing economic and knowledge-based changes. Data were collected through a Google Forms questionnaire administered to 406 undergraduate students in Economics and Accounting, selected through purposive sampling. The instrument included 27 Likert-scale items based on previously validated dimensions and adapted to the Ecuadorian higher education context. The analysis included Cronbach's alpha, EFA, CFA, and multiple linear regression in RStudio. EFA results suggested a two-factor empirical structure comprising economic knowledge and applied skills. CFA results provided partial support for this structure, with acceptable CFI, TLI, and SRMR values, although the RMSEA value indicated limitations in global model fit. The regression model showed a high R^2 value; however, this result was interpreted with caution because the predictors and the dependent variable came from the same self-reported questionnaire. This study concludes that preparedness depends on theoretical knowledge, technological, and innovation-oriented competencies developed within the university environment.

Keywords knowledge-based economy, higher education, university students, perceived readiness, human capital

JEL Classification I23, I25, J24, O15

INTRODUCTION

The consolidation of the knowledge-based economy has reshaped the sources of growth and competitiveness by placing knowledge, human capital, innovation, digital capabilities, and the productive use of information at the center of economic and social development. In this study, knowledge-based economy refers to an economic model where the creation, application, and diffusion of knowledge drive employability, productivity, innovation, and sustainable development. Within this paradigm, higher education moves beyond disciplinary content transmission and becomes a strategic infrastructure for capacity building, as it articulates the cognitive, technological and socio-emotional skills required in knowledge-intensive environments (Becker, 1964; Singh & Blessinger, 2024).

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However, in developing countries, the transition to this paradigm occurs under structural constraints that limit universities' educational role (Aleixo et al., 2020; Castro & Lopes, 2022). In Ecuador, unequal access to technology and connectivity creates an uneven scenario for developing skills associated with the knowledge-based economy. For example, by 2025, household internet access reached 71.3% nationally, with marked gaps between urban (76.6%) and rural (58.7%) areas. This gap may lead to unequal educational trajectories in the effective use of digital resources for learning, productivity, and innovation (INEC, 2025).

Added to this material gap is a broader limitation in innovation capacity. Ecuador ranks low in international metrics of innovation performance, suggesting persistent difficulties in converting knowledge into technological and productive outcomes. In the Global Innovation Index 2025, Ecuador ranks 113th out of 139 economies, a position consistent with structural challenges in sustaining ecosystems of applied research, knowledge transfer, and productive sophistication (WIPO, 2025). These conditions show that student preparation for a knowledge-based economy depends not only on individual academic performance, but also on institutional and territorial conditions.

In this context, universities must train professionals capable of interpreting economic processes, managing information, adapting to technological change, and participating in innovation-oriented environments. This role is especially relevant in cities such as Ambato, located in central Ecuador, where business and productive sectors have gradually moved toward more knowledge-intensive forms of organization, management and decision-making. Therefore, higher education institutions in this type of territorial context must align academic training with the skills required by dynamic labor and productive systems.

The scientific problem is not simply that students need more skills, but that the structure of university preparation for the knowledge-based economy remains unclear in contexts such as Ecuador. In particular, there is uncertainty regarding the internal coherence of the dimensions commonly associated with this preparation, including economic knowledge, applied skills, digital capabilities, infrastructure, enabling conditions, and innovation. Evidence also remains limited on whether these dimensions operate as separate components or whether they reorganize into broader empirical factors when measured in specific higher education contexts (Rottleb, 2023; Singh & Blessinger, 2024). Although institutions often declare alignment with employability and innovation demands, comparable and validated evidence on the architecture of this preparation remains limited and fragmented.

Therefore, the core problem addressed in this study is the insufficient validated empirical understanding of Ecuadorian university students' preparation for the knowledge-based economy, both in terms of its factorial structure and the consistency between enabling conditions and perceived competencies. This knowledge gap limits the ability to determine whether university education generates skills aligned with knowledge-intensive environments or whether structural imbalances persist between what institutions promote and what students consolidate under real conditions of access, academic training, and territorial economic transformation.

1. LITERATURE REVIEW AND HYPOTHESES

An understanding of economics is central to students' preparedness for a knowledge-based economy because it allows future professionals to interpret how economic systems operate and how different actors make decisions within them. Economic knowledge includes the comprehension of markets, firms, households, governments, and institutions, as well as the capacity to analyze economic behavior at both microeconomic and macroeconomic levels (Singh & Blessinger, 2024; Syed et al., 2024; Vlasov et al., 2022). In higher education, this dimension acquires relevance because universities must balance their traditional role as

centers of knowledge preservation with increasing expectations to contribute to economic development, employability and productive transformation (Bosetti & Walker, 2010). Therefore, economic knowledge does not only refer to theoretical understanding, but also to the ability to apply economic reasoning in practical and changing contexts shaped by globalization, digital transformation and new forms of professional work (Hope & Limberg, 2022; Nuraini et al., 2024).

The literature also emphasizes that preparedness for a knowledge-based economy requires more than disciplinary knowledge. Students need applied competencies that allow them to respond to economic challenges, technological change, and complex labor market conditions. Critical thinking, creativity, adaptability, problem-solving, communication, and decision-making skills have become relevant components of professional training because they support the transition from academic knowledge to practical performance in dynamic environments (Elshaiekh et al., 2024; Nakano & Wechsler, 2018). Evidence from higher education contexts shows that students may recognize the importance of these skills, but gaps often persist between awareness and application. For this reason, curricula must strengthen the connection between theoretical learning, professional practice, and the productive sector (Al-Abri et al., 2024; Mhlongo et al., 2025).

Entrepreneurial education and knowledge transfer also contribute to students' preparation for knowledge-intensive environments. The literature suggests that entrepreneurship training should not be limited to technical content, but should promote creativity, initiative, critical thinking and adaptability, since these elements increase students' capacity to identify opportunities and respond to uncertain economic scenarios (Krueger & Brazeal, 1994; Mhlongo et al., 2025). In this context, knowledge transfer mechanisms strengthen the relationship between universities, industry and society, helping higher education institutions connect academic training with innovation, employability and economic problem-solving (Compagnucci & Spigarelli, 2024). These contributions support the inclusion of readiness for economic challenges as one of the dimensions of student preparedness.

Preparation for education constitutes another relevant dimension because the knowledge-based economy requires higher education systems capable of developing both technical and transversal competencies. University education must provide students with opportunities to acquire knowledge, apply it in real or simulated contexts, and develop skills such as critical thinking, interdisciplinary collaboration, creativity, and complex problem-solving (Happ et al., 2018; Holmes & Mayhew, 2016). In this sense, education becomes a mechanism for linking disciplinary training with innovation-oriented learning and professional transformation. This is especially important in developing contexts, where universities face the challenge of adapting curricula to labor markets that increasingly demand analytical, technological and adaptive capacities (Chen, 2012).

Infrastructure is also essential for preparing students for a knowledge-based economy. Access to technological resources, digital libraries, virtual platforms, connectivity, laboratories, and institutional support conditions the way students acquire, process, and apply knowledge. Adequate infrastructure improves access to information and strengthens students' ability to participate in learning environments where digital tools and applied knowledge play a central role (Dang et al., 2024). In this sense, infrastructure should not be understood only as physical equipment, but as an enabling condition that allows students to transform information into competencies relevant to professional and productive contexts (Jowi, 2012; Mizyed & Eccles, 2023).

Innovation represents a further dimension of student preparedness because the knowledge-based economy depends on the capacity to generate, adapt, and apply knowledge to solve economic and social problems. Universities contribute to innovation when they promote research-based learning, interaction with productive sectors, entrepreneurial initiatives and academic environments that value creativity and applied problem-solving (Mosey et al., 2012; Paoloni et al., 2019; Vesperi et al., 2021). The literature on university-industry interaction shows that collaboration between academic institutions and external actors can strengthen knowledge transfer, professional skills, and innovation-oriented capacities

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(Broström et al., 2021; Lauvås & Steinmo, 2021; Boardman, 2009). Therefore, readiness for innovation is relevant for examining whether students perceive their training as aligned with knowledge-intensive professional demands.

Previous empirical studies provide a basis for analyzing student preparedness through multiple dimensions. Thalgi (2020), for example, examined the university's role in developing knowledge economy skills and found that students may present acceptable levels of information organization, use of technology, and problem-solving, without necessarily showing consistent improvement throughout their academic progression. Similarly, Parveen et al. (2021) identified associations between access to knowledge, infrastructure, financing, research and development, human capital formation, and university-industry collaboration in the creation of a knowledge-based economy. These studies show that student preparedness should be analyzed through both individual competencies and institutional conditions.

Based on this literature, the present study initially considered five theoretical dimensions of preparedness for the knowledge-based economy: economic knowledge (PE) (Dobrovolska et al., 2023; Seidl, 2023; Wirba, 2022); preparation for economic challenges (KT) (Seidl, 2023; Siddiqui & Afzal, 2022); preparation for education (KP)) (Brodny & Tutak, 2022; Lotfi et al., 2018); preparation for infrastructure (KI) (Dang et al., 2024); and disposition for innovation (KN) (Al-Housani et al., 2024; Qahl & Sohaib, 2023). These dimensions were adapted to the Ecuadorian higher education context to examine whether they maintain empirical consistency among students from Economics and Accounting.

These dimensions were selected because they connect disciplinary knowledge, applied competencies, educational conditions, technological resources, and innovation-oriented capacities. However, the study did not assume that these five dimensions would necessarily operate as independent empirical factors. Instead, they served as the initial theoretical structure for examining how student preparedness is organized in the Ecuadorian higher education context through exploratory and confirmatory factor analysis.

This distinction is important because the theoretical model derived from literature and the empirical structure obtained from the data do not necessarily have to be identical. The five dimensions guided the construction of the questionnaire and the organization of the initial measurement model, while the factorial analyses examined whether these dimensions remained separate or reorganized into broader latent factors. Therefore, the study treats the five-dimensional proposal as a theoretical starting point rather than as a predetermined final structure.

This approach is relevant for the case of Economics and Accounting students at the Faculty of Accounting and Auditing of the Technical University of Ambato. These academic programs are directly related to economic analysis, financial decision-making, information management, organizational control, and professional competencies required in knowledge-intensive environments. In addition, Ambato's business sector has gradually moved toward more knowledge-intensive economic dynamics, which makes this institutional context appropriate for examining whether university training provides students with the competencies needed to participate in a knowledge-based economy.

In response to this need, this study investigates university students' preparedness for the knowledge-based economy through the empirical examination of the proposed theoretical dimensions and their association with students' perceived professional readiness. This formulation allows the study to distinguish between the initial theoretical model and the empirical structure obtained from the data, avoiding the assumption that the five dimensions necessarily operate as independent factors in the Ecuadorian higher education context.

On this basis, the following hypotheses have been proposed:

H1: Readiness for the knowledge-based economy is expected to present a multidimensional structure composed of economic knowledge and applied competencies.

H2: The theoretical dimensions associated with the knowledge-based economy are expected

to show empirical consistency when adapted to the Ecuadorian higher education context, although their final factorial organization may differ from the initial theoretical model.

H3: Students' perceived professional readiness is expected to be associated with economic knowledge and applied competencies, controlling for sociodemographic and academic variables.

2. METHODOLOGY

The research adopted a quantitative approach because the objective was to measure and statistically examine the dimensions associated with university students' preparedness for the knowledge-based economy (Creswell, 2014). The study followed a non-experimental, descriptive, correlational, and explanatory design. Exploratory Factor Analysis (EFA) was used to examine the empirical organization of the theoretical dimensions (Govindasamy et al., 2024), followed by Confirmatory Factor Analysis (CFA) to evaluate the consistency and fit of the proposed structure (Rogers, 2024). Finally, a multiple linear regression model estimated the association between the identified factors, sociodemographic variables, and students' perceived preparedness (Gujarati & Porter, 2009).

The study population consisted of university students enrolled in Economics and Accounting at the Faculty of Accounting and Auditing of the Technical University of Ambato. This university offered a relevant institutional context because it is a public higher education institution with strong academic relevance in central Ecuador, located in a city whose business sector has gradually moved toward more knowledge-intensive economic dynamics. Purposive sampling selected participants whose academic training related directly to economic analysis, financial decision-making, information management, and organizational control. The final sample consisted of 406 students, from the first to the seventh semester, who responded to a digital questionnaire via Google Forms. Data collection took place over a three-month period, between June and August 2025, under conditions of anonymity and voluntary participation (Giner-Sorolla et al., 2024).

The study used a structured questionnaire based on dimensions previously validated by Nagari et al. (2023) relating to preparedness for the knowledge-based economy and adapted to the context of Ecuadorian higher education. The questionnaire included five theoretical dimensions associated with the knowledge-based economy: knowledge of economics, readiness for economic challenges, readiness for education, readiness for infrastructure, and readiness for innovation. The instrument operationalized these dimensions through 27 items, organized on five-point Likert scales (1 = Strongly disagree; 5 = Strongly agree), to capture students' level of agreement with statements related to their training for a knowledge-based economy.

Given the scope of the study, the factorial analysis was conducted at the level of aggregated theoretical dimensions rather than at the individual item level. First, the 27 questionnaire items were organized according to the five theoretical dimensions proposed in the literature: economic knowledge, readiness for economic challenges, readiness for education, readiness for infrastructure, and readiness for innovation. Then, composite scores were calculated for each dimension and used in the exploratory and confirmatory factor analyses. This procedure allowed the study to examine whether the theoretical dimensions remained empirically differentiated or reorganized into broader latent factors in the Ecuadorian higher education context.

The internal consistency of the instrument was evaluated using Cronbach's alpha coefficient for each dimension, obtaining the following values: knowledge of economics ($\alpha = 0.841$), readiness for economic challenges ($\alpha = 0.841$), readiness for education ($\alpha = 0.758$), readiness for infrastructure ($\alpha = 0.862$), and readiness for innovation ($\alpha = 0.798$). All coefficients exceeded the minimum acceptable threshold of 0.70, confirming the adequate reliability of the scales.

Data processing used RStudio software, version 4.4.2, together with libraries specializing in multivariate analysis. The psych package supported the Exploratory Factor Analysis (Revelle, 2025), *lavaan* supported the Confirmatory Factor Analysis and semPlot enabled the structural visualiza-

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tion of the models (Epskamp et al., 2022). The stats package fitted the multiple linear regression model to estimate the influence of the validated factors on students' perception of preparedness (Ackerman, 2025).

The EFA made it possible to examine the dimensional organization of the five aggregated theoretical constructs derived from the 27 questionnaire items. Rather than analyzing each item separately, the analysis evaluated whether the theoretical dimensions proposed in the literature remained independent or reorganized into broader empirical factors. To this end, the maximum likelihood (ML) method was used, given that the data met the assumptions of multivariate normality (Costello & Osborne, 2005); Varimax orthogonal rotation was also applied to facilitate the interpretation of the factors obtained (Zhang et al., 2024). The analysis suggested a two-factor structure at the level of aggregated theoretical dimensions. This factor solution explained 77.2% of the total variance and presented high communalities, providing preliminary evidence of dimensional reorganization in the study sample.

Based on the exploratory structure, CFA evaluated the fit of the two-factor empirical model. The results showed acceptable values for CFI = 0.955, TLI = 0.909, and SRMR = 0.031; however, RMSEA = 0.178 indicated limitations in global model fit. Therefore, the CFA results were interpreted with caution. The model was not treated as definitive confirmation of the theoretical structure, but as partial evidence supporting a two-factor empirical organization that requires further validation in future studies.

To identify the factors associated with students' perceptions of their preparedness to enter a knowledge-based economy, the study estimated a multiple linear regression model. The dependent variable corresponded to students' perceived professional readiness and was measured through the following self-assessment item included in the questionnaire: "I consider that my university training has prepared me to participate effectively in a knowledge-based economy." This item was treated as the global measure of perceived readiness. The predictor variables included economic knowledge and applied skills, together with the sociodemographic and academic variables: degree program, academic semester, and gender.

Since both the predictor variables and the dependent variable came from the same self-reported questionnaire, the regression results were interpreted as associative rather than causal. This design may involve common method variance because students evaluated their competencies, learning conditions, and perceived readiness in the same instrument and at the same point in time. Therefore, the model identified patterns of statistical association, not causal effects.

The proposed mathematical model is shown below:

$$Percetion = \beta_0 + \beta_1 Factor1 + \beta_2 Factor2 + \beta_3 Gender + \beta_4 Semester + \beta_5 Degree + \varepsilon, \quad (1)$$

where β_0 is the intercept or constant term of the model. β_1 to β_5 represent the coefficients of each of the factors included. **ε** is the random error term, which groups together all the variability not explained by the predictors.

The regression model produced a high R^2 value of 0.91. However, this result was interpreted with caution because both the predictors and the dependent variable came from the same self-reported questionnaire. Therefore, the high explained variance may partly reflect shared measurement method, conceptual proximity between the variables, or response consistency across items. The normality of the residuals was assessed using the Shapiro-Wilk test, obtaining a value of p = 0.094. Additionally, homoscedasticity was tested using the Breusch-Pagan test, which yielded a result of p = 0.118, indicating the absence of significant heteroscedasticity. The variance inflation factor (VIF) was also calculated to detect collinearity between the independent variables, and in all cases the values were less than 2, indicating acceptable levels of independence between predictors.

3. RESULTS

The results show that the preparation of students in the Faculty of Accounting and Auditing for a knowledge-based economy is organized around two main dimensions. On the one hand, a fac-

tor linked to economic knowledge (PE) is identified; on the other, a set of applied skills emerges, which groups together the constructs of economic challenges (KT), educational preparation (KP), technological infrastructure (KI), and innovation (KN). These dimensions suggest a two-factor empirical organization that received partial support from confirmatory factor analysis. When examining how these dimensions are associated with students' perceptions of their level of preparation, the results indicate that both theoretical knowledge and practical skills show statistically significant relationships. Applied skills carry greater weight in this perception, highlighting the relevance of operational, technological, and attitudinal elements in the context of a knowledge-based economy.

Exploratory factor analysis reveals a two-factor solution with clear and consistent loadings between the theoretical constructs (Figure 1).

The EFA representation shows an empirical grouping into two factors: the first associated solely with the construct of economic knowledge (PE_Knowledge) and the second comprising economic challenges, education, infrastructure, and innovation. This configuration suggests a possible differentiation between conceptual knowledge and a set of practical or applied skills.

The factorial structure highlights the differentiation between a component exclusive to economic knowledge and another that empirically groups the applied competencies related to economic challenges, education, infrastructure, and innovation. This grouping identifies patterns in the organization of the aggregated theoretical dimensions. Therefore, the results should be interpreted as evidence of dimensional reorganization at the construct level, rather than as item-level validation of the questionnaire.

Figure 2 shows positive and statistically significant correlations among the aggregated theoretical dimensions included in the exploratory factor analysis. These relationships suggest that the constructs share common variance, which may explain their empirical reorganization into broader factors. However, this evidence should be interpreted as descriptive support for the observed associations, not as proof of model robustness.

Based on these findings, a confirmatory factor analysis was conducted to evaluate the fit of the proposed two-factor structure and examine its consistency with the empirical data.

Table 1. Exploratory factor analysis loadings at the theoretical-dimension level

Dimension	ML1	ML2	h^2	Dominant Factor
PE_Knowledge	0.931	0.358	0.995	F1
KT_EconomicChallenges	0.48	0.711	0.736	F2
KP_Education	0.247	0.714	0.571	F2
KI_Infrastructure	0.321	0.817	0.77	F2
KN_Innovation	0.549	0.698	0.789	F2

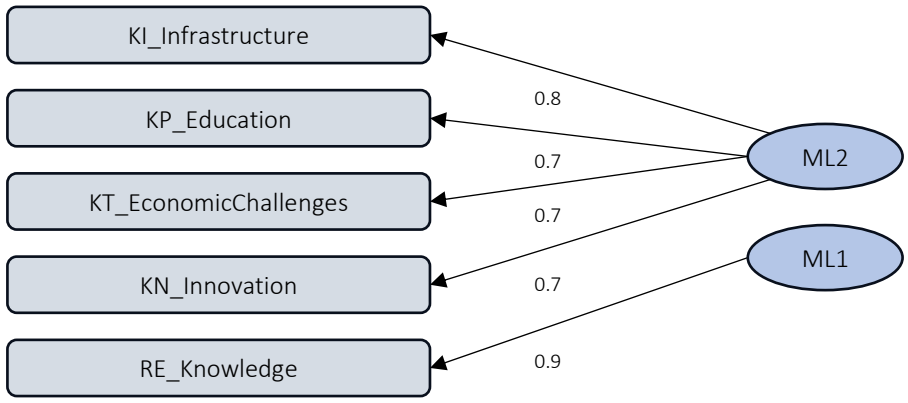


Figure 1. Diagram of factor loadings for the dimensions of the knowledge-based economy

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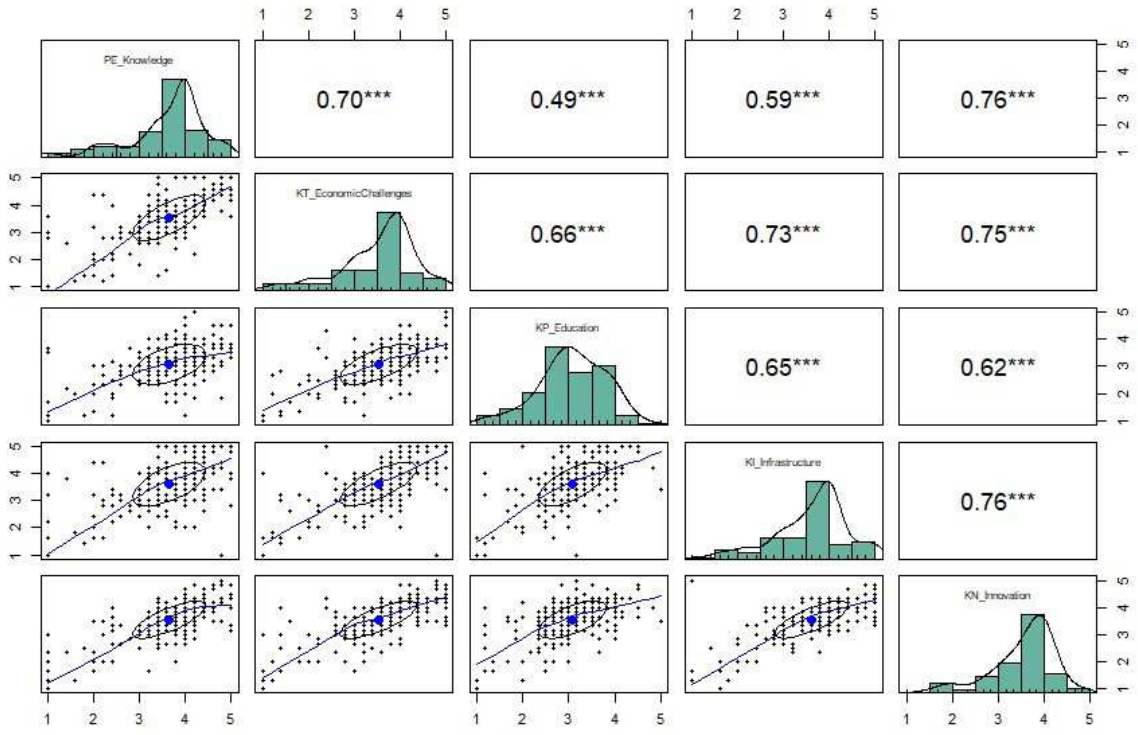


Figure 2. Scatter plot matrix of the exploratory factor analysis

Figure 3 suggests a two-factor organization similar to that obtained in the exploratory analysis. Factor 1 is mainly associated with PE_Knowledge, while Factor 2 groups KT_Economic Challenges, KP_Education, KI_Infrastructure, and KN_ Innovation. However, given the elevated RMSEA value, this structure should be interpreted as a context-specific empirical solution rather than as a fully confirmed measurement model.

A significant correlation was observed between both factors, indicating a common underlying basis despite their theoretical differentiation. This result suggests that economic knowledge and applied skills are related dimensions of students perceived preparedness. However, given the mixed CFA fit indices, this relationship should be interpreted as preliminary evidence of structural consistency rather than as definitive validation of the conceptual framework.

Based on the two-factor empirical structure, a multiple linear regression model was estimated to identify which factors were associated with stu-

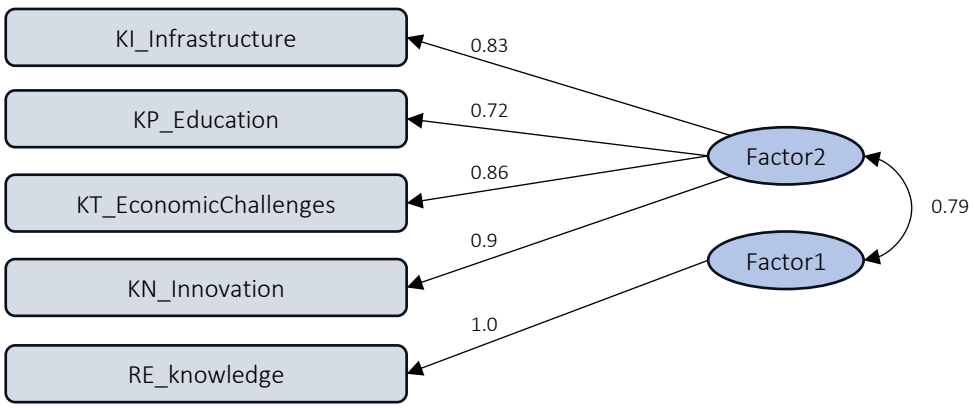


Figure 3. Factor loadings of the confirmatory factor analysis for the knowledge-based economy

Table 2. Linear regression model for the knowledge-based economy

Variable	Coefficient (β)	Standard error	t-value	p-value
Intercept	0.31	0.0165	18.8	< 0.001***
Factor 1	0.105	0.0351	2.99	0.003**
Factor 2	0.141	0.0335	4.21	< 0.001***
Gender	0.005	0.0328	0.15	0.884
Semester	0.042	0.0172	2.44	0.015**
Degree	0.058	0.0248	2.34	0.019**

Note: * p < 0.05; ** p < 0.01; *** p < 0.001; no symbol: insignificant.

dents' perceived preparedness to enter a knowledge-based economy.

The multiple linear regression model indicates that both economic knowledge and applied skills are significantly associated with students' perceived preparedness to enter a knowledge-based economy. The coefficient of Factor 2 (β = 0.141; p < 0.001) represents the largest contribution to the model, showing that practical skills related to economic challenges, education, infrastructure, and innovation showed the strongest association with student perceptions. Economic knowledge (Factor 1) also showed a significant association (β = 0.105; p = 0.003), although with a lesser effect. The model indicates that, holding all other variables constant, a one-unit increase in Factor 2 increases students' perception of preparedness by 0.141 units. Similarly, a one-unit increase in Factor 1 is associated with a 0.105-unit increase in the perception of preparedness.

In terms of sociodemographic variables, the academic semester (β = 0.042; p = 0.015) and the degree program (β = 0.058; p = 0.019) are significantly associated with the perceived level of preparedness, indicating that students in higher levels and in the Economics degree program perceive themselves as more prepared than students in the accounting degree program. On the other hand, gender does not have a statistically significant effect (p = 0.884), suggesting similar levels of self-perceived preparedness between men and women in this sample. In this sense, it can be inferred that as students progress through their studies, their perception increases by 0.042 units, while belonging to the Economics program increases the perceived level of preparation by 0.058 units.

These results indicate that both the empirical factors and academic characteristics were associated with students' perceptions of their preparedness for the knowledge-based economy. Applied skills show the greatest marginal association, highlighting the relevance of operational, technological, and attitudinal components in students' self-assessment of their ability to face current challenges. Based on these findings, the analyzed dimensions provided useful evidence for examining students' perceived preparedness for the knowledge-based economy. However, because the analysis was conducted at the level of aggregated dimensions and the CFA showed mixed fit indices, the results should be interpreted as preliminary and context-specific.

Based on the statistical evidence presented, the hypotheses received partial empirical support. The EFA results supported the presence of a two-factor structure, while the CFA results provided mixed evidence due to the elevated RMSEA value. Therefore, H1 and H2 should be interpreted with caution. The regression model supported H3 in associative terms, showing that economic knowledge and applied skills were significantly related to perceived readiness.

4. DISCUSSION

The findings provide preliminary empirical evidence on how university students perceive their preparedness to face the challenges of a knowledge-based economy. In line with the views of Rottleb (2023) and Singh and Blessinger (2024), higher education cannot be limited to the transmission of content but must act as a catalyst for the development of skills for highly dynamic work contexts. In this regard, the results suggest that students' perceived preparedness is associated not only with disciplinary knowledge, but also with the perceived capacity to apply knowledge in tech-

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nological, institutional, and innovation-oriented environments.

The evidence associated with *H1* and *H2* suggests that student readiness may follow a multidimensional structure in the Ecuadorian higher education context. However, the high RMSEA value indicates that the two-factor solution requires further refinement and validation before being treated as a stable measurement model. Furthermore, the evidence associated with *H3* underscores that while theoretical knowledge is essential, the institutional environment and applied skills are strongly associated with students' perceived professional readiness.

In this institutional context, students appear to perceive a connection between their academic training and the demands of the knowledge-based economy, especially considering its role as a public university located in a central region where productive and business sectors are gradually moving toward more knowledge-intensive dynamics.

In this sense, the finding that applied skills carry more weight in the perception of preparedness than economic knowledge itself reinforces the findings of Alattiq (2023) and Zaidan et al. (2024), who highlight that innovation, creativity, and adaptability have become fundamental assets within the knowledge-based economy. This transition towards practical skills implies a reconfiguration of the educational objectives of higher education institutions, where theoretical learning must be complemented by applied, technological, and problem-solving competencies. These findings should not be generalized to all Ecuadorian universities. Rather, they describe a specific institutional context and provide a basis for comparison with future studies in other faculties, regions, and higher education systems.

This result also aligns with the findings of Castro and Lopes (2022), who point out that the relevance of university education becomes more visible when students can integrate theoretical knowledge with functional skills that enable them to function in technological, collaborative, and complex problem-solving environments. This convergence between theory and practice is clearly reflected in the empirical grouping of the second factor identified, which brings together economic challenges, education, infrastructure, and innovation. Therefore, the two-factor solution does not reduce the complexity of preparedness but organizes it into two complementary axes: economic knowledge and applied skills.

Within this framework, the empirical results suggest that students do not perceive their preparation as an isolated result of disciplinary knowledge, but rather as an integral construct influenced by various learning environments. This is closely related to the findings of Makarenko et al. (2021) and Dang et al. (2024), who emphasize that educational infrastructure, as a facilitator of access to technology, information, and collaborative environments, is a key component in the consolidation of human capital. In the Ecuadorian context, this point is particularly relevant because differences in connectivity, access to digital resources, and institutional support may shape the way students develop competencies for knowledge-intensive environments.

The significant association between the academic semester and the perception of preparedness also supports the findings of Happ et al. (2018) and Holmes and Mayhew (2016), in that academic progress can enhance the development of cross-cutting skills. In other words, as students progress in their education, they not only accumulate knowledge, but also consolidate the skills necessary to respond to the demands of the global labor market. This finding suggests that the university trajectory contributes progressively to students' self-perceived readiness, although this effect should be interpreted in relation to the specific curriculum and learning experiences of each program.

In this way, the fact that Economics students perceive themselves as better prepared than Accounting students could be related to a greater theoretical-practical focus in the curriculum of the former, which coincides with Brodny and Tutak's (2022) assertion about the need to integrate entrepreneurship and financial education into the classroom as a strategy to increase professional competitiveness. However, this difference should not be interpreted as a deficit in Accounting training, but as evidence that different curricular ori-

entations may influence how students assess their own preparedness for knowledge-intensive professional environments.

In contrast, the lack of significant influence of gender on the perception of preparedness suggests that training and self-assessment opportunities are being offered more equitably in this educational context. This finding is consistent with the principles of inclusion and equity promoted in SDG 4 (Aleixo et al., 2020); which emphasizes the importance of ensuring quality education without distinction based on gender or other social conditions. Nevertheless, the absence of statistical significance should be interpreted with caution, since it reflects the behavior of this sample and does not necessarily imply the absence of gender-related differences in other institutional or disciplinary contexts.

These findings can be related to broader discussions on quality education and employability, particularly because applied skills, infrastructure, and innovation are relevant to the transition from university training to professional performance. However, the results should be interpreted within the specific institutional context analyzed and should not be generalized to the entire Ecuadorian higher education system.

From a broader theoretical perspective, this research also supports Mok and Sawn Khai (2024), who point out that, in a globalized, knowledge-based economy, countries that invest strategically in higher education, research, and emerging technologies achieve sustainable competitive advantages. The significant relationship between factors such as infrastructure and innovation and the perception of preparedness provides empirical evidence in favor of this assertion. Thus, the study contributes to the literature by showing that, in the institutional context analyzed, students' perceived readiness was associated not only with economic knowledge, but also with applied and institutional conditions related to education, infrastructure, and innovation (Comunian et al., 2014).

Finally, it should be emphasized that preparing for the knowledge-based economy cannot be understood as an individual or isolated goal, but rather as the result of an educational ecosystem that articulates multiple dimensions of training. As proposed by Vlasov et al. (2022) and Syed et al. (2024), the promotion of an entrepreneurial culture and comprehensive university policies is essential for students to not only acquire knowledge, but also develop a transformative mindset geared toward innovation, sustainability, and collective well-being. Accordingly, the main implication of this study is that higher education institutions may use these findings as contextual evidence to review the articulation between disciplinary training, applied learning, and institutional support conditions.

CONCLUSIONS

The aim of this study was to examine university students' preparedness for the knowledge-based economy through the empirical analysis of theoretical dimensions and their association with perceived professional readiness. The results suggest that student preparedness was organized around two complementary empirical dimensions: economic knowledge and applied skills. Economic knowledge appeared as a differentiated component, while applied skills grouped the dimensions related to economic challenges, education, infrastructure, and innovation. However, this structure should be interpreted with caution because the CFA provided only partial support due to limitations in global model fit.

The regression results indicated that both economic knowledge and applied skills were significantly associated with students' perceived professional readiness, with applied skills showing the strongest association. Academic semester and degree program were also associated with perceived readiness, while gender did not show a statistically significant relationship. These findings suggest that students' perception of preparedness depends not only on disciplinary knowledge, but also on applied competencies developed through academic training and institutional learning conditions.

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The main conclusion derived from these findings is that preparation for the knowledge-based economy should be understood as a combination of conceptual economic knowledge and applied competencies. In the context analyzed, students' readiness was not explained by isolated theoretical knowledge, but by the articulation between knowledge, educational experiences, technological conditions, and innovation-oriented skills. Therefore, higher education institutions should interpret these results as contextual evidence for reviewing how academic training connects disciplinary learning with professional demands in knowledge-intensive environments.

This study has methodological limitations that should be considered. First, the factorial analysis was conducted using aggregated dimension scores rather than individual item-level responses; therefore, the results do not replace a full item-level validation of the questionnaire. Second, perceived readiness was measured through a self-assessment item, which captures students' subjective evaluation but does not necessarily reflect objective professional performance. Finally, the institutional scope of the study limits the generalization of the findings to other universities, regions, or academic fields. Future research should replicate the model in other higher education institutions, compare different disciplinary areas, and conduct item-level EFA and CFA.

AUTHOR CONTRIBUTIONS

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