

Public Policies for Flexible Educational Trajectories in the Employability of Graduates of Technological Higher Education

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ABSTRACT:

The main objective of this research was to explain the impact of public policies on flexible educational trajectories on the employability of Higher Technological Education (ESTP) graduates in a Peruvian region during the period 2025–26. The research employed a quantitative, applied approach with a non-experimental, correlational-causal design. A sample of 165 graduates was surveyed using a standardised questionnaire. The descriptive results indicated that the majority of graduates perceived the level of compliance with flexible educational trajectories policies as 'adequate' (50.3%). Analysis of a structural equation model (SEM) and ordinal logistic regression confirmed the general hypothesis that public policies of flexible educational trajectories have a direct and significant impact on the employability of ESTP graduates. The most significant inferential finding is that the causal relationship is highly positive ($\beta = 0.86$; $p < 0.01$) and that flexible policies account for 74% of the variability in graduates' employability (R^2). It was concluded that strengthening the flexibility dimensions (mainly the diversified offer and guidance mechanisms, despite challenges regarding mobility between programmes) would substantially improve the quality of employment and acquisition of market-demanded skills. It is recommended that the relevant bodies prioritise collaboration with the regional productive sector to maximise the relevance of the training and address administrative inefficiencies in the mobility dimension.

Keywords: Public policies, Flexible trajectories, Employability, Technological higher education

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Introduction

Public policies for flexible educational trajectories in technological higher education have become a strategic approach to addressing

three structural challenges: school dropout, timely completion of studies, and ensuring training remains relevant in the context of regional labour market demands. In regions such as La Libertad, where technical training is crucial

for economic growth, flexible training routes based on mobility between programmes and levels, recognition of prior learning, and modular organisation of studies are directly linked to labour market entry, continuous skill development, and improved employment conditions for graduates.

International evidence suggests that rigid technical systems can exacerbate the mismatch between educational offerings and the needs of the labour market, thereby limiting educational mobility and the capacity to adapt to technological and organisational changes. In developing countries, organisations such as the OECD, UNESCO and the World Bank have highlighted that poor articulation between technical and vocational education and the labour market is associated with higher rates of informality, low-quality jobs and the persistence of socioeconomic disparities. Recent studies in Latin America show that only a limited proportion of education policies effectively incorporate flexible pathways between secondary, technical and higher education, thereby restricting young people's opportunities for progression and social mobility.

In Peru, and specifically in La Libertad, sectoral diagnoses reveal a significant discrepancy between the design of training programmes and the requirements of the regional production sector. Many technological higher education institutions lack sustained plans for collaboration with businesses, while Technical-Productive Education graduates face high levels of informality, lower incomes, and limited opportunities to continue their studies in technology or at university. This situation shows that policies of flexible educational trajectories have not yet managed to consolidate themselves as an effective mechanism to guarantee dignified employment, reduce inequalities, and promote sustainable territorial development.

Meanwhile, the global development agenda, as set out in the Sustainable Development Goals (SDGs), emphasises the importance of transitioning to quality, inclusive and relevant technical education that is closely linked to

decent work and reducing social disparities. SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth) emphasise the importance of training systems that can ensure continuous, lifelong learning, while SDG 10 (Reduced Inequalities) directly challenges countries to create genuine employment opportunities for young people from disadvantaged backgrounds. From this perspective, educational flexibility is no longer optional but a structural component of public policies aimed at strengthening human capital and regional competitiveness.

Within this framework, the focus of this research is to explain the impact of public policies on flexible educational trajectories on the employability of Technological Higher Education graduates in a Peruvian region in 2025. Employability is assumed to encompass not only access to a job, but also dimensions such as the quality of employment, the acquisition of marketable skills and job satisfaction. Using this approach, the study aims to identify the extent to which mobility between programmes and levels, a diverse range of training options, and guidance and advisory services contribute to enhancing the employment and professional development opportunities of ESTP graduates in La Libertad.

The study has theoretical and practical relevance for three main reasons. Firstly, it provides empirical evidence on the effectiveness of educational flexibility policies in a regional context characterised by high labour informality and mismatches between training and productive demand. Secondly, it specifies which dimensions of flexible educational trajectories have the greatest impact on employability, offering concrete suggestions for redesigning regulatory instruments, institutional management strategies, and mechanisms for articulating with the productive sector. Thirdly, it contributes to reflection on the human development model associated with technical education by highlighting the tension between job placement achievements and persistent fragility in graduate satisfaction and well-being in the workplace.

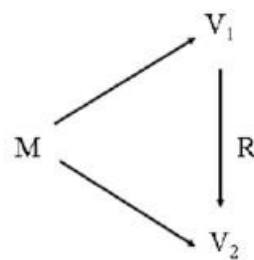
The following central research question is therefore formulated: what impact do public policies have on flexible educational trajectories in terms of the employability of Technological Higher Education graduates in a Peruvian region in 2025? This question aims to describe the level of compliance with these policies and employability in its different dimensions, as well as determining the effect of each flexibility component – mobility, diversified supply and guidance – on job quality, the acquisition of in-demand skills, and job satisfaction. These questions will guide the development of the article and structure the empirical analysis presented in the subsequent sections.

II. Methodology

The methodology of this study is classified as applied research, adhering to the principles of the

OECD Oslo Manual (2018). The main objective was to address a specific issue using existing knowledge: the impact of public policies on the employability of ESTP graduates in regional management through flexible educational trajectories. The study employed a quantitative approach, collecting numerical data through standardized surveys. This allowed the relationship between the variables to be analyzed using statistical techniques.

The study was designed as a non-experimental, causal, correlational, cross-sectional study. This means the variables were observed and measured in their real context, without intervention or manipulation by the researcher, to determine their degree of association. (Zúñiga, 2023).



M : Managers and teachers of technological higher education

V1 : Diagnosis of public policies for flexible educational trajectories

V2 : Diagnosis of employability of graduates

R : Impact of V1 on V2

The scope of the research was limited to higher education institutions specializing in technology located in the study area. In terms of time, the research considered the public policies implemented and the employability results of the graduates during a specific period (for example, the last five years). Institutionally, the research focused on analyzing policies from the Ministry of Education and their implementation in the EST of the region, as well as monitoring the labor trajectories of its graduates.

The conceptual framework established the concept of variable public policies of flexible educational trajectories. Ahmed (2021) defines these policies as the group of guidelines, norms, and programs that the state implements to

diversify learning paths. The idea is that students can build educational paths tailored to their needs, interests, and personal circumstances. Houlden (2021) defines them as strategies governments use to remove barriers and facilitate students' movement between different levels and types of education. This promotes lifelong learning. Finally, Barua (2024) explains that flexible educational policies imply creating and promoting a diverse educational offering. For our first variable, we considered the following dimensions: mobility between programs and levels, a diversified training offer, and guidance and advice mechanisms (Membrillo, 2021).

Within the conceptual framework of the employability variable, Asefer (2021) defines it as the ability of individuals who have completed

their education to enter, remain in, and advance within the labor market. This means getting a high-quality job that allows them to develop their full potential and contribute to society. Cook (2022) points out that employability refers to the set of competencies (i.e., knowledge, skills, and attitudes) that graduates acquire during their training. Employers value and demand these competencies, thus facilitating graduates' access to meaningful job opportunities. Mainga (2022) explains that employability implies correspondence between graduates' skills and qualifications and the actual needs of available jobs. The dimensions of the employability variable are job quality, acquisition of in-demand skills, and job satisfaction. (Mgaiwa, 2021).

This research's unit of analysis was each worker and official of the Regional Education Management. The total population of the study consisted of all directors and teachers of institutes of technological higher education ($n = 360$). For this study, the target population was limited to all managers and teachers of technological higher education in the province of Trujillo (160 individuals). Inclusion criteria included being a director or active teacher of technological higher education in the Regional Education Management at the time of data collection. A non-probability convenience sample of 165 principals and teachers who met the inclusion criteria and were accessible for survey administration was selected. This method was chosen due to the specificity of the participants required for the research and their accessibility.

The survey technique was used to collect the data because, according to Hernández (2014), it allows us to formulate questions aligned with the study's hypotheses and variables. Two specific questionnaires were designed: one to evaluate public policies for flexible educational trajectories, and the other to evaluate the employability of ESTP graduates. Both were tailored based on the defined dimensions and indicators. Each instrument consisted of 18 items, distributed by dimension, i.e., six items for each dimension. The measurement scale was a polytomous Likert scale, where the minimum

value was 1 (strongly disagree) and the maximum value was 5 (strongly agree).

To ensure content validity, a trial with five experts was carried out using the Aiken V method. The experts, who were professionals in public management, transparency, and research methodology, evaluated the relevance and coherence of the questions. Validity is fundamental for the reliability of the indicators (Torres, 2022).

Construct validity of the instruments for the variables was performed using SPSS version 27, which calculated the KMO test and Bartlett's sphericity statistic. The results obtained in each dimension are detailed below. Dimensions of the variable public policies of flexible educational trajectories: Mobility between programs and levels (KMO = 0.878, adequacy measure > 0.50; Bartlett sphericity test = 0.000, $p < 0.05$);

Diversified range of training modalities (KMO = 0.814, adequacy measure > 0.50; Bartlett sphericity test = 0.000, $p < 0.05$);

Guidance and counseling mechanisms (KMO = 0.832, adequacy measure > 0.50; Bartlett sphericity test = 0.000, $p < 0.05$).

For the employability dimensions: The quality of employment variable (KMO = 0.853, >0.50 adequacy measure; Bartlett's sphericity test = 0.000, <0.05) and acquisition of in-demand competencies (KMO = 0.860, >0.50 adequacy measure; Bartlett's sphericity test = 0.000, <0.05) were examined. Additionally, job satisfaction (KMO = 0.854, >0.50 adequacy measure; Bartlett's sphericity test = 0.000, <0.05) was examined.

Additionally, a pilot test was carried out with a small sample of about 15 people from the target population. This allowed us to verify the clarity of the questions and instructions, as well as evaluate internal consistency and determine reliability with Cronbach's alpha coefficient. As Hernández Sampieri (2014) indicates, it is crucial to remember that an instrument is valid when it measures what it proposes. The expert validations, duly drafted and signed, were included in the annexes, as were the results of the

Cronbach's alpha reliability analysis of the pilot test. The reliability of the variable "Public Policies of Flexible Educational Trajectories" was 0.877, as were the dimensions "Mobility Between Programs and Levels" (0.902), "Diversified Offer of Training Modalities" (0.852), and "Guidance and Advice Mechanisms" (0.879). The reliability of the variable "Employability" was 0.877, as were the dimensions "Job quality" (0.820), "Acquisition of demanded skills" (0.914), and "Job satisfaction" (0.898).

The data collected from the surveys were processed and analyzed using the SPSS (Statistical Package for the Social Sciences) statistical software, and the AMOS software was used for the MEEs where necessary. First, descriptive statistics were carried out for each variable and its dimensions. This included constructing frequency and percentage tables, which are essential for characterizing the sample and the study variables. To test the hypotheses,

inferential statistics were used, employing the following techniques: Ordinal logistic regression was used to evaluate the association between the variables, and Nagelkerke's coefficient was applied to estimate the proportion of variance explained. Finally, to determine the impact of and the complex causal relationships among the dimensions of public policies of flexible educational trajectories on the employability of ESTP graduates, structural equation models (SEM) were applied.

The principles of scientific integrity, as stipulated in the UCV Code of Research Ethics (8N°0470-2024/UCV), were complied with during the conduct of this study. Employees and officials voluntarily participated in the study after receiving an explanation of the study's purpose, the confidentiality of their answers, and their right to abstain or withdraw at any time. To protect privacy, collected information was anonymized for research purposes.

III. Results

3.1 Descriptive diagnostic results

Table 1 *Diagnoses of the levels of public policy variables of flexible trajectories and employability.*

Levels	Public policies for flexible educational trajectories		Employability	
	N°	%	N°	%
Poor	10	6.1%	22	13.3%
Regular	72	43.6%	70	42.4%
Suitable	83	50.3%	73	44.2%
Total	165	100%	165	100%

Note: Application of instruments to the participating sample.

Interpretation: As shown in Table 1, the variable "public policies of flexible trajectories" was at an appropriate level (50.3%), followed by a regular level (43.6%), and finally, a deficient level (6.1%). Based on the descriptive results, we can conclude that directors and teachers of technological higher education manage these policies

adequately. The employability variable was also at an appropriate level (44.2%), followed by a regular level (42.4%), and finally a deficient level (13.3%). Based on these results, it can be concluded that students of technological higher education do not reach adequate levels of employability.

Table 2 Diagnoses of levels of the dimensions for the variable public policies of flexible trajectories.

Dimensions	Poor		Regular		Suitable		Total	
	Nº	%	Nº	%	Nº	%	Nº	%
Mobility between programmes and levels	14	8.5%	79	47.9%	72	43.6%	165	100%
Diversified offer of training modalities	13	7.9%	73	44.2%	79	47.9%	165	100%
Guidance and advice mechanisms	14	8.5%	66	40.0%	85	51.5%	165	100%

Note: Application of instruments to the participating sample.

Interpretation: Table 2 shows that the Mobility dimension was at the regular level (47.9%), followed by the adequate level (43.6%) and the deficient level (8.5%). This suggests that the La Libertad region does not adequately manage this dimension. The dimension "Diversified Offer of Training Modalities" was at the appropriate level (47.9%), followed by the regular level (44.2%), and finally, the deficient level (7.9%). This

suggests that this dimension is adequately managed in the La Libertad region. Finally, it is noted that the dimension "Guidance and Counseling Mechanisms" was at the appropriate level (51.5%), followed by the regular level (40%), and finally, the deficient level (8.5%). This suggests that this dimension is adequately managed in the La Libertad region.

Table 3 Diagnoses of the levels of the dimensions for the employability variable.

Dimensions	Poor		Regular		Suitable		Total	
	Nº	%	Nº	%	Nº	%	Nº	%
Quality of employment	16	9.7%	81	49.1%	68	51.1%	165	100%
Acquisition of Skills Demanded	6	3.6%	56	33.9%	103	62.4%	165	100%
Job satisfaction	48	29.1%	50	30.3%	67	40.6%	165	100%

Note: Application of instruments to the participating sample.

Interpretation: From Table 3, we can see that the quality of employment dimension was at an adequate level (51.1%), followed by a regular level (49.1%) and, lastly, a deficient level (9.7%). This suggests that the La Libertad region adequately manages this dimension. Additionally, it was observed that the acquisition of demanded competencies dimension was at an adequate level

(62.4%), followed by a regular level (33.9%) and a deficient level (3.6%), indicating that this dimension is adequately managed in the La Libertad region. Additionally, it was noted that the job satisfaction dimension was at an adequate level (40.6%), followed by a regular level (30.3%), and finally, a deficient level (29.1%), indicating

that this dimension is adequately managed in the La Libertad region.

3.2 Bivariate results

Table 4 Cross-table of public policies on flexible trajectories and employability and ordinal regression of the general hypothesis.

Employability		Public policies for flexible educational trajectories			Total
		Poor	Regular	Suitable	
Poor	N°	5	15	2	22
	%	3.0%	9.1%	1.2%	13.3%
Regular	N°	5	41	24	70
	%	3.0%	24.8%	14.5%	42.4%
Suitable	N°	0	16	57	73
	%	0.0%	9.7%	34.5%	44.2%
Total	N°	10	72	83	165
	%	6.1%	43.6%	50.3%	100.0%
Model		Logarithm verisimilitude	Chi Square	gl Sig.	R2 Nagelkerke
Intersection		73.916	53.722	2 <0.00	32.2%
Final		20.194			

Note: Application of instruments to the participating sample.

Interpretation: Table 4 shows that 34.5% of the respondents perceive an adequate level of public policies on flexible educational trajectories and an adequate level of employability, likewise 24.8% of the participants perceive a regular level on public policies on flexible educational trajectories and a regular level of employability. The Sig. value < 0.01 reveals that the data is highly significant at the 99% confidence level. This implies that the probability that the observed relationship

between public policies of flexible educational trajectories and employability is the product of chance is less than 1%. Likewise, Nagelkerke's R² (a measure of the model's explanatory capacity in ordinal regressions) is 32.2%, which represents a regular level of model definition. In other words, public policies of flexible educational trajectories explain 32.2% of the variability in employability, which is strong empirical evidence in favor of a positive and significant influence.

Table 5 Cross-table of public policies on flexible trajectories and job quality and ordinal regression of specific hypothesis 1.

Quality of employment		Public policies for flexible educational trajectories			Total
		Poor	Regular	Suitable	
Poor	N°	5	9	2	16

Regular	%	3.0%	5.5%	1.2%	9.7%
	Nº	4	52	25	81
	%	2.4%	31.5%	15.2%	49.1%
Suitable	Nº	1	11	56	68
	%	0.6%	6.7%	33.9%	41.2%
Total	Nº	10	72	83	165
	%	6.1%	43.6%	50.3%	100.0%
Model	Logarithm verisimilitude	Chi Square	gl Sig.	R2 Nagelkerke	
Intersection	79.894	58.397	2 <0.00	35.2%	
Final	21.497				

Note: Application of instruments to the participating sample.

Interpretation: Table 5 shows that 33.9% of the respondents perceive an adequate level of public policies on flexible educational trajectories and an adequate level of job quality, and 31.5% of the participants perceive an adequate level of public policies on flexible educational trajectories and a regular level of job quality. The Sig. value < 0.01 reveals that the data is highly significant at the 99% confidence level. This implies that the probability that the observed relationship

between public policies on flexible educational trajectories and job quality is the product of chance is less than 1%. Likewise, Nagelkerke's R² (a measure of the model's explanatory capacity in ordinal regressions) is 35.2%, which represents a regular level of explanation of the model. In other words, public policies of flexible educational trajectories explain 35.2% of the variability in job quality, which is strong empirical evidence in favor of a positive and significant influence.

Table 6 Cross-table of public policies of flexible trajectories and acquisition of competencies demands and ordinal regression of the specific hypothesis 2.

Acquisition of Skills Demanded		Public policies for flexible educational trajectories			Total
		Poor	Regular	Suitable	
Poor	Nº	3	3	0	6
	%	1.8%	1.8%	0.0%	3.6%
Regular	Nº	5	41	10	56
	%	3.0%	24.8º%	6.1%	33.9%
Suitable	Nº	2	28	73	103
	%	1.2%	17.0%	44.2%	62.4%
Total	Nº	10	72	83	165
	%	6.1%	43.6%	50.3%	100%
Model	Logarithm verisimilitude	Chi Square	gl Sig.	R2 Nagelkerke	

Intersection	74.638			
Final	18.854	55.785	2 <0.00	36.3%

Note: Application of instruments to the participating sample.

Interpretation: Table 6 shows that 44.2% of the respondents perceive an adequate level of public policies of flexible educational trajectories and an adequate level of acquisition of demanded competencies, likewise 24.8% of the participants perceive a regular level of public policies of flexible educational trajectories and a regular level of acquisition of demanded competencies. The Sig. value < 0.01 reveals that the data is highly significant at the 99% confidence level. This implies that the probability that the observed relationship between public policies of flexible

educational trajectories and the acquisition of demanded competencies is the product of chance is less than 1%. Likewise, Nagelkerke's R^2 (a measure of the model's explanatory capacity in ordinal regressions) is 36.3%, which represents a regular level of explanation of the model. In other words, public policies of flexible educational trajectories explain 36.3% of the variability of acquisition of competencies demanded, which is strong empirical evidence in favor of a positive and significant influence.

Table 7 *Cross-table of public policies on flexible trajectories and job satisfaction and ordinal regression of the specific hypothesis 3.*

Job Satisfaction		Public policies for flexible educational trajectories			Total
		Poor	Regular	Suitable	
Poor	N°	5	25	18	48
	%	3.0%	15.2%	10.9%	29.1%
Regular	N°	5	34	11	50
	%	3.0%	20.6%	6.7%	30.3%
Suitable	N°	0	13	54	67
	%	0.0%	7.9%	32.7%	40.6%
Total	N°	10	72	83	165
	%	6.1%	43.6%	50.3%	100%

Model	Logarithm verisimilitude	Chi Square	gl Sig.	R2 Nagelkerke
Intersection	70.603			
Final	40.848	29.761	2 <0.00	18.6%

Note: Application of instruments to the participating sample.

Interpretation: Table 7 shows that 32.7% of the respondents perceive an adequate level of public policies on flexible educational trajectories and an adequate level of job satisfaction, and 20.6% of the participants perceive an adequate level of public policies on flexible educational trajectories and a regular level of job satisfaction. The Sig.

value < 0.01 reveals that the data is highly significant at the 99% confidence level. This implies that the probability that the observed relationship between public policies of flexible educational trajectories and job satisfaction is the product of chance is less than 1%. Likewise, Nagelkerke's R^2 (a measure of the model's

explanatory capacity in ordinal regressions) is 18.6%, which represents a low level of explanation of the model. In other words, public policies on flexible educational trajectories

explain 18.6% of the variability in job satisfaction, which is weak empirical evidence in favor of a positive and significant influence.

Table 8 *Cross-table of employability and mobility between programs and levels and ordinal regression of the specific hypothesis 4.*

Employability		Mobility between programmes and levels			Total
		Poor	Regular	Suitable	
Poor	N°	7	10	5	22
	%	4.2%	6.1%	3.0%	13.3%
Regular	N°	6	45	19	70
	%	3.6%	27.3%	11.5%	42.4%
Suitable	N°	1	24	48	73
	%	0.6%	14.5%	29.1%	44.2%
Total	N°	14	79	72	165
	%	8.5%	47.9%	43.6%	100%

Model	Logarithm verisimilitude	Chi Square	gl Sig.	R2 Nagelkerke
Intersection	58.676	35.129	2 <0.00	22.2%
Final	23.547			

Note: Application of instruments to the participating sample.

Interpretation: Table 8 indicates that 29.1% of the respondents distinguish an adequate level of employability and an adequate level of mobility between programs and levels, and 27.3% of the participants perceive a regular level of employability and a regular level of mobility between programs and levels. The Sig. value < 0.01 reveals that the data is highly significant at the 99% confidence level. This implies that the probability that the observed relationship between employability and mobility between

programs and levels is the product of chance is less than 1%. Likewise, Nagelkerke's R^2 (a measure of the explanatory capacity of the model in ordinal regressions) is 22.2%, which implies that the model has a low explanatory power. In other words, mobility between programs and levels explains only 22.2% of the variability in employability, which constitutes limited empirical evidence that suggests a positive and significant influence

Table 9 *Cross table of employability and diversified offer of training modalities and ordinal regression of the specific hypothesis 5.*

Employability		Diversified offer of training modalities			Total
		Poor	Regular	Suitable	
Poor	N°	6	7	0	13
	%	3.6%	4.2%	0.0%	7.9%

Regular	N°	13	41	19	73
	%	7.9%	24.8%	11.5%	44.2%
Suitable	N°	3	22	54	79
	%	1.8%	13.3%	32.7%	47.9%
Total	N°	22	70	73	165
	%	13.3%	42.4%	44.2%	100%

Model	Logarithm verisimilitude	Chi Square	gl Sig.	R2 Nagelkerke
Intersection	68.763	47.327	2 <0.00	28.9%
Final	21.436			

Note: Application of instruments to the participating sample.

Interpretation: Table 9 indicates that 32.7% of the respondents perceive an adequate level of employability and an adequate level of diversified offer of training modalities, as well as 24.8% of the participants distinguish a regular level of employability and a regular level of diversified offer of training modalities. The Sig. value < 0.01 reveals that the data is highly significant at the 99% confidence level. The probability that the relationship observed between employability and

the diversified offer of training modalities is the product of chance is less than 1%. On the other hand, Nagelkerke's R² value, which indicates the explanatory power of the model in ordinal regressions, is 28.9%, which reflects a low level of explanation. This means that the diverse offer of training modalities only explains 28.9% of the variability in employability, providing limited empirical evidence on a positive and significant influence.

Table 10 *Cross-table of employability and guidance and counselling mechanisms and ordinal regression of the specific hypothesis 6.*

Employability		Guidance and advice mechanisms			Total
		Poor	Regular	Suitable	
Poor	N°	6	14	2	22
	%	3.6%	8.5%	1.2%	13.3%
Regular	N°	8	38	24	70
	%	4.8%	23.0%	14.5%	42.4%
Suitable	N°	0	14	59	73
	%	0.0%	8.5%	35.8%	44.2%
Total	N°	14	66	85	165
	%	8.5%	40.0%	51.5%	100%

Model	Logarithm verisimilitude	Chi Square	gl Sig.	R2 Nagelkerke
Intersection	79.872	58.657	2 <0.00	34.7%
Final	21.215			

Note: Application of instruments to the participating sample.

Interpretation: Table 10 shows that 35.8% of the respondents perceive an adequate level of employability and an adequate level of guidance and counseling mechanisms, likewise 23.0% of the participants perceive a regular level of employability and a regular level of guidance and counseling mechanisms. The Sig. value < 0.01 reveals that the data is highly significant at the 99% confidence level. This implies that the probability that the observed relationship

between employability and guidance and counseling mechanisms is the product of chance is less than 1%. Likewise, Nagelkerke's R^2 (a measure of the model's explanatory capacity in ordinal regressions) is 34.7%, which represents a regular level of explanation of the model. In other words, guidance and counseling mechanisms explain 34.7% of the variability in employability, which is weak empirical evidence in favor of a positive and significant influence.

3.3 Multivariate result

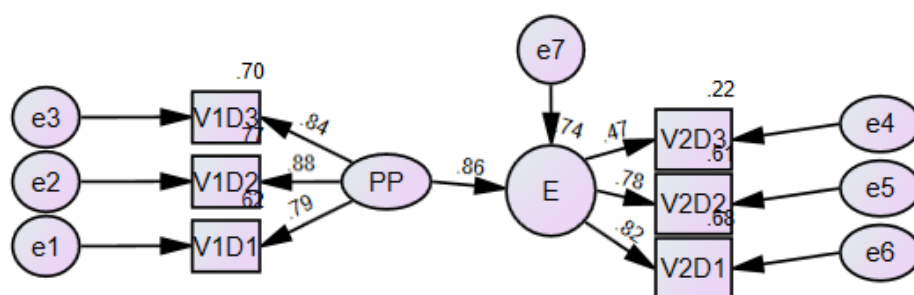


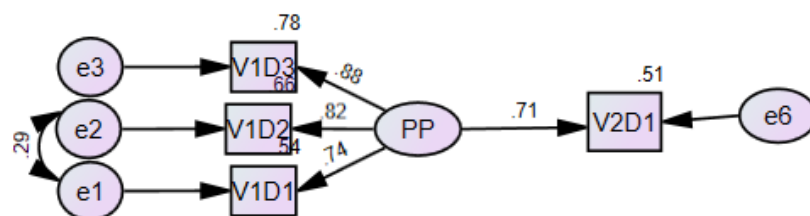
Figure 1 Diagram of the influence of flexible public education policies on employability in the La Libertad region 2025

Note: Observed variables (dimensions) are denoted in rectangles and latent variables in circles, in addition the arrows indicate the direction and the values in the middle indicate the magnitude of the influence.

Interpretation: For this first structural model, the adjustment indices that evaluate the influence of flexible educational public policies on employability are reported an X^2/df ratio of 1.811, an RMSEA of 0.07 and a CFI of 0.987;

these values indicate an acceptable fit of the model, according to the criteria commonly established in the literature ($X^2/df < 5$, RMSEA $\leq .08$, CFI $\geq .90$). Overall, the indices support the validity of the proposed model to explain the influence of flexible public educational policies on employability; with a causal relationship of 0.86 (very high) and where employability is explained by 74% of flexible public educational policies.

Figure 1 Diagram of the influence of flexible educational public policies on the quality of employment in the La Libertad 2025 region.



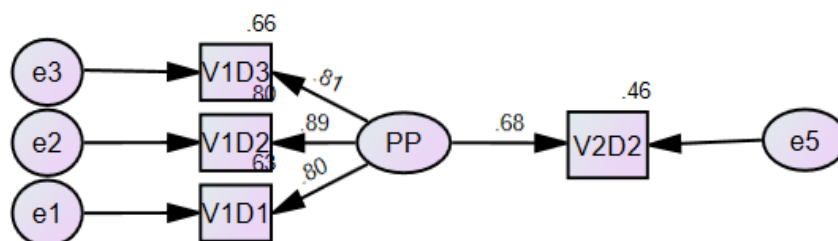
Note: Observed variables (dimensions) are denoted in rectangles and latent variables in circles, in addition the arrows indicate the direction and the values in the middle indicate the magnitude of the influence.

Interpretation: For this structural model, the adjustment indices that evaluate the influence of flexible educational public policies on the quality of employment are reported as an X^2/df ratio of 0.774, an RMSEA of 0.00 and a CFI of 1.000;

these values indicate an acceptable fit of the model, according to the criteria commonly established in the literature ($X^2/df < 5$, RMSEA $\leq .08$, CFI $\geq .90$). Overall, the indices support the validity of the proposed model to explain the

influence of flexible public education policies on the quality of employment; with a causal relationship of 0.71 (high) and where the quality of employment is explained by 51% of flexible public educational policies.

Figure 2 Diagram of the influence of flexible educational public policies on the acquisition of competencies demanded in the La Libertad region 2025.

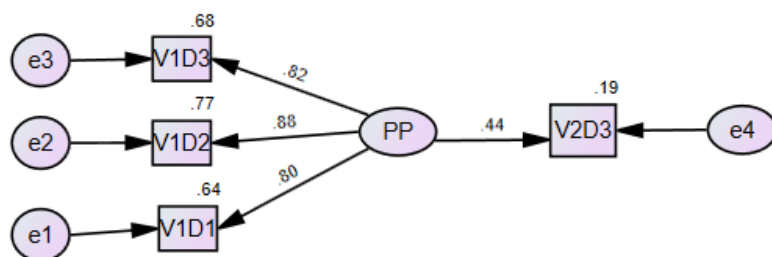


Note: Observed variables (dimensions) are denoted in rectangles and latent variables in circles, in addition the arrows indicate the direction and the values in the middle indicate the magnitude of the influence.

Interpretation: For this structural model, the adjustment indices that evaluate the influence of flexible educational public policies on the acquisition of demanded competencies are reported an X^2/df ratio of 1.24, an RMSEA of 0.38 and a CFI of 0.999; these values indicate an

acceptable fit of the model, according to the criteria commonly established in the literature ($X^2/df < 5$, RMSEA $\leq .08$, CFI $\geq .90$). Overall, the indices support the validity of the model proposed to explain the influence of flexible public educational policies on the acquisition of in-demand competencies; with a causal relationship of 0.68 (mean) and where the acquisition of demanded competencies is explained by 46% of flexible public educational policies.

Figure 3 Diagram of the influence of flexible educational public policies on job satisfaction in the La Libertad region 2025.

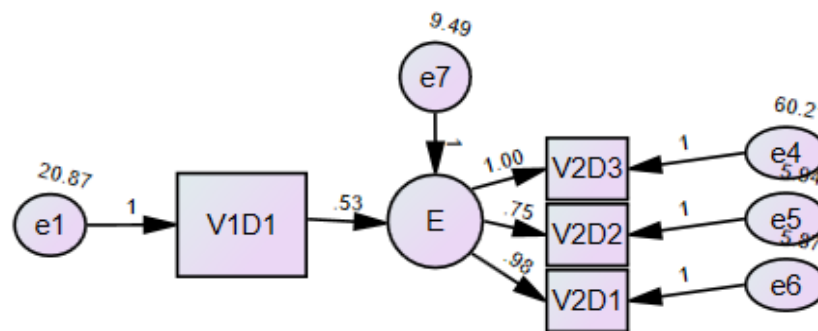


Note: Observed variables (dimensions) are denoted in rectangles and latent variables in circles, in addition the arrows indicate the direction and the values in the middle indicate the magnitude of the influence.

Interpretation: For this structural model, the adjustment indices that evaluate the influence of flexible educational public policies on job satisfaction report an X^2/df ratio of 2.56, an

RMSEA of 0.097 and a CFI of 0.989; these values indicate an acceptable fit of the model, according to the criteria commonly established in the literature ($X^2/df < 5$, RMSEA $\leq .08$, CFI $\geq .90$). Overall, the indices support the validity of the proposed model to explain the influence of flexible educational public policies on job satisfaction; with a causal relationship of 0.44 (mean) and where job satisfaction is explained by 19% of flexible public educational policies.

Figure 4 *Diagram of the influence of mobility between programs and levels on employability in the La Libertad 2025 region.*

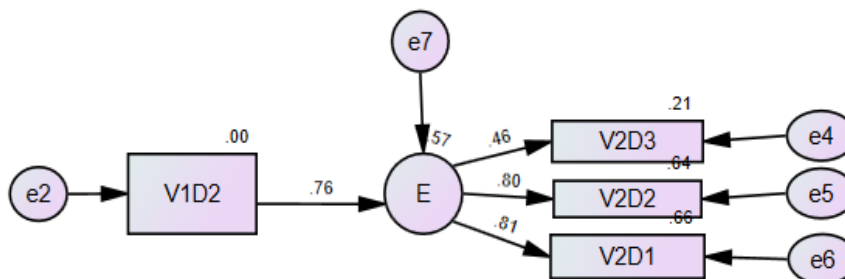


Note: Observed variables (dimensions) are denoted in rectangles and latent variables in circles, in addition the arrows indicate the direction and the values in the middle indicate the magnitude of the influence.

Interpretation: For this structural model, the adjustment indices that evaluate the influence of mobility between programs and levels on employability are reported as an X^2/df ratio of 0.972, an RMSEA of 0.000 and a CFI of 1.000;

these values indicate an acceptable fit of the model, according to the criteria commonly established in the literature ($X^2/df < 5$, RMSEA $\leq .08$, CFI $\geq .90$). Overall, the indices support the validity of the proposed model to explain the influence of mobility between programs and levels on employability; with a causal relationship of 0.53 (mean) and where employability is explained with a 9.49% mobility between programs and levels.

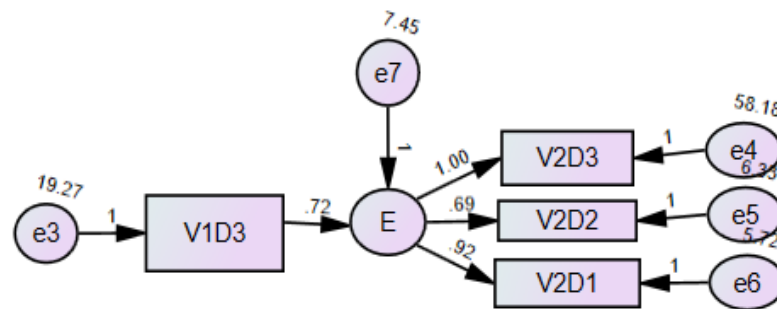
Figure 5 *Diagram of the influence of the diversified offer of training modalities on employability in the La Libertad 2025 region.*



Note: Observed variables (dimensions) are denoted in rectangles and latent variables in circles, in addition the arrows indicate the direction and the values in the middle indicate the magnitude of the influence.

Interpretation: For this structural model, the adjustment indices that evaluate the influence of the diversified supply of training modalities on employability are reported as an X^2/df ratio of 2.088, an RMSEA of 0.081 and a CFI of .990;

these values indicate an acceptable fit of the model, according to the criteria commonly established in the literature ($X^2/df < 5$, RMSEA $\leq .08$, CFI $\geq .90$). Overall, the indices support the validity of the proposed model to explain the influence of the diversified supply of training modalities on employability; with a causal relationship of 0.76 (high) and where employability is explained by 57% of diversified offer of training modalities.

Figure 6 *Diagram of the influence of guidance and advice mechanisms on employability in the La Libertad 2025 region.*

Note: Observed variables (dimensions) are denoted in rectangles and latent variables in circles, in addition the arrows indicate the direction and the values in the middle indicate the magnitude of the influence.

Interpretation: For this structural model, the adjustment indices that evaluate the influence of guidance and counseling mechanisms on employability, an X^2/df ratio of 1.87, an RMSEA of 0.073 and a CFI of .992 are reported; these values indicate an acceptable fit of the model, according to the criteria commonly established in the literature ($X^2/df < 5$, RMSEA $\leq .08$, CFI $\geq .90$). Overall, the indices support the validity of the proposed model to explain the influence of guidance and counselling mechanisms on employability; with a causal relationship of 0.72 (high) and where employability is explained with 7.45% of guidance and counseling mechanisms

IV. Discussion

This section is devoted to an exhaustive and critical interpretation of the empirical findings, contrasting them rigorously with the previously presented theoretical framework and scientific background. The fundamental purpose is to validate the raised hypotheses and generate inferences that explain the dynamics between Public Policies of Flexible Educational Trajectories (V1) and Employability (V2) of Technological Higher Education (EST) graduates in the La Libertad region. The central finding of this research strongly confirms the general hypothesis, demonstrating that flexible policies are essential to graduates' professional success. Results from the structural equation model revealed a positive and highly significant causal relationship between the manipulated

variable and the measured variable (Sig. < 0.01). Specifically, the standardized regression coefficient (beta) was 0.86. In statistical and practical terms, this implies a very strong influence: for each unit improvement in flexible trajectory implementation, graduate employability increases proportionally by 0.86 units. Furthermore, Nagelkerke's R^2 indicates that 74% of the variability in employability is directly explained by flexibility policies. In the context of Technological Higher Education in La Libertad, this suggests that job success depends more on the institutional capacity to manage adaptable curricula and the type of technical professional trained than on exogenous factors or chance.

When we start the discussion at the level of the specific univariate objectives, the panorama of the implementation of the policies and the level of employability becomes apparent. The first objective, which aimed to determine the degree of adherence to public policies on flexible educational trajectories and their dimensions (mobility between programs and levels, diverse training options, and guidance and advisory mechanisms), revealed acceptable overall compliance, albeit with significant internal disparities. The dimension of the diversified training modality offer was the best valued, reflecting a visible and functional institutional effort to introduce updated pedagogical methods and dual modalities. However, mobility between programs and levels was predominantly at a regular level (47.9%), suggesting that although the regulations exist on paper, they face severe administrative and operational inefficiencies in their execution. Thus, while there is political will to make the educational offerings more flexible

for ESTP students, rigid validation and transfer processes remain critical barriers.

The second objective, which focused on specifying the level of employability and its dimensions (quality of employment, acquisition of in-demand skills, and job satisfaction), revealed a paradox that invites in-depth reflection on the type of professional being trained. First, the Acquisition of Demanded Competencies dimension was the highest rated (62.4% at the appropriate level), confirming that flexible policies are achieving their primary objective of transferring high-value technical and technological skills (hard skills), and that graduates are valued for their know-how. This coincides with the arguments of Huamaní (2024) and Hisbes (2024) that technical competence determines access to employment in Peru. However, the job satisfaction dimension presents a critical scenario, with a considerable proportion of graduates performing at a deficient level (29.1%). This suggests a disconnect between graduates' high technical ability and their well-being or fulfillment in their jobs. This could be linked to the lack of integration of socio-emotional skills, ethics, and stress management in flexible training programs. In other words, a high level of labor insertion is being achieved, but low emotional sustainability in employment.

The results of the bivariate objectives are crucial for understanding the specific weight of each flexibility policy on work success. The objective focused on determining the impact of mobility between programs and levels on employability showed low explanatory power in the structural model. Mobility influences employability but explains only 9.49% of its variance (with a moderate beta of 0.53). This dimension has the least impact. This disconnection is interpreted as inefficiency in the administrative execution of mobility. Bureaucratic barriers to credit validation, a lack of standardization among institutes, and delays in issuing modular certifications prevent mobility from providing real advantages to graduates. This finding aligns with De la Cruz's (2023) warning that deficient administrative management of certifications is a structural barrier in Peru. Contrary to the theory of flexibility, the local practice remains rigid. This

forces students to restart training processes instead of building on what they have learned. This dilutes the impact of this dimension on their work success. When a graduate perceives that their efforts in a modular training program are not recognized by another institute, they lose the competitive advantage of a fluid trajectory. This forces a permanence that flexibility sought to avoid.

In contrast, determining the impact of the diversified supply of training modalities on employability is the most influential dimension, with a beta coefficient of 0.76 that explains 57% of employability. This data reveals that implementing models such as dual education, alternation, and project-based learning is the most effective strategy for institutes to connect with regional job opportunities. This is consistent with Rebolledo (2021), who emphasizes the importance of the "HEI-Business" connection. Diversifying the supply allows the curriculum to adapt to productive demand, validating the premise that curricular relevance is the basis of employability. Implementing teaching models that simulate real scenarios and collaborate directly with the productive sector improves technical (hard) skills and exposes students to employer culture and expectations, reducing the clash between training and the labor market.

Similarly, the objective of determining the impact of guidance and counseling mechanisms on employability showed a significant impact ($\beta = 0.72$). This result corroborates Sánchez's (2025) stance on the significance of graduate follow-up. Orientation is not an ancillary service. It acts as an information bridge (networking) that reduces asymmetries in the labor market, enabling graduates to find faster, better-aligned opportunities. A robust monitoring and mentoring system helps graduates interpret the demand for soft skills and navigate selection processes. These elements are crucial for access to and retention in higher-ranking positions.

The next set of bivariate objectives relates policies to specific employability dimensions. The objective of determining the impact of public policies on flexible educational trajectories on job quality demonstrated a significant impact, explaining 51% of the variance in job quality.

This strong link is explained by the fact that flexibility, through a diversified offering, ensures that graduates obtain positions that require their high technical specialization. High curricular relevance translates directly into better salaries, formal contracts, and benefits—fundamental characteristics of quality jobs. Flexible graduates are better positioned to negotiate since their profile is aligned with the needs of the productive sector.

The objective of establishing the impact of public policies on the acquisition of demanded competencies showed the model's clearest success. Since the acquisition of competencies was the most highly valued dimension in the descriptive analysis, it makes sense that flexibility shows high explanatory power. This validates flexible teaching methods, such as modular programs and intensive internships, as efficient vehicles for developing and transferring specialized technical competencies and digital skills. The ability of institutes to quickly adapt their curricula to new technological demands, such as automation or data analysis, gives graduates from La Libertad a competitive advantage over graduates from regions with more rigid models.

Finally, establishing the impact of public policies on job satisfaction yields the most disturbing result. The structural model reveals that flexible policies have the lowest explanatory power ($R^2 = 19\%$) and causal force ($\beta = 0.44$). This means that the current educational model efficiently "places" graduates in jobs and ensures their technical quality but is insufficient to guarantee their well-being, fulfillment, and emotional stability in those jobs. This discrepancy aligns with Sánchez's (2022) European findings, which warned that training focused solely on productivity and technical skills neglects humanistic and socio-emotional dimensions.

The discussion here transcends the economic realm. Public policies train "qualified labor," but not necessarily "full professionals." The low explanation of job satisfaction suggests that factors such as resilience, stress management, ethics, life purpose, and leadership skills (soft skills) are not sufficiently integrated into curricular flexibility. This leaves graduates

vulnerable to the pressures of the real work environment, such as work overload or toxic organizational culture, which requires a pedagogical intervention focused on the student's integral development.

When we compare these results with previous literature, we see theoretical coincidences, as well as differences in magnitude that contribute new insights to the field of study. Our data corroborate and amplify Gibaja's (2025) findings at the national level. Gibaja had already reported a positive correlation between labor insertion and employability. However, our study goes beyond a simple association by establishing a direct, weightier causality. Similarly, these results align with the international research of Orefice (2025), which was conducted in Italy. Orefice concluded that flexible (transdisciplinary) pedagogical approaches predict salary success. Our study validates that this phenomenon is not exclusive to the European context but is also present in the Andean region. This suggests that flexibility acts as a universal mechanism for enhancing human capital by providing students with the tools necessary to navigate market uncertainty. In short, public policies on flexible educational trajectories robustly explain the impact on employability, but this impact is uneven. They are highly effective in placement and technical skills but weak in administrative articulation and guaranteeing the emotional well-being of graduates. This finding necessitates a reevaluation of regional education policy priorities, shifting the focus from merely "increasing supply" to "administrative efficiency" and "human integration" in the curriculum.

To maintain scientific rigor, it is crucial to acknowledge the limitations of this research to minimize the scope of its generalizations. First, the study is limited by time due to its cross-sectional design. Although beta coefficients allow us to model statistical causal influences, irreversible causality cannot be affirmed over time without longitudinal monitoring. The results reflect a "snapshot" of the current moment (2025) and could vary in the face of drastic economic changes or the implementation of new education laws. Second, there are sampling and geographical limitations. Most of the data

collection took place in institutes in urban and peri-urban areas of the La Libertad region. Therefore, generalization of these findings to deep rural areas or regions with very different business environments (e.g., the jungle or the southern highlands) must be done cautiously. The dynamics of employability in these contexts may be mediated by informality or infrastructure variables that this model has not fully captured. In light of these findings and limitations, questions arise that deserve to be addressed by the academic community in future studies. The most pressing question concerns the low explanation of student mobility. Qualitative research is imperative to explore the "invisible" barriers (organizational culture, resistance to change, and legal gaps) that hinder the fluid validation of studies from the perspective of managers and administrators. Similarly, given the concern about low job satisfaction, longitudinal studies evaluating the well-being of graduates one, three, and five years after graduation are recommended. It would be valuable to incorporate moderating variables, such as the organizational climate of the employing companies or the soft skills of the graduate, to determine whether the dissatisfaction stems from a failure in educational training or from the precarious conditions of the Peruvian labor market. Only in this way will it be possible to understand comprehensive employability.

V. Conclusions

Public policies that allow for flexible educational trajectories have a significant and positive influence on the employability of graduates from technological higher education institutions (EST) in the La Libertad region ($p < 0.01$). The structural equation model (SEM) establishes a strong causal relationship ($\beta = 0.86$) and confirms that variability in employability (V_2) is 74% explained by flexible trajectory policies (V_1), making these policies the primary strategic factor for labor success in the regional context. This finding validates the central thesis of flexible human capital, which postulates that institutional adaptability, manifested in diverse training routes, is the strongest predictor of successful entry into and retention in a dynamic and constantly

changing labor market.

The level of compliance with the public policies on flexible educational trajectories in the ESTs of the La Libertad region is predominantly adequate at the global level (56.2% average compliance). However, heterogeneous execution is observed between its dimensions. While the diversified offer of training modalities and guidance and advisory mechanisms exhibit adequate compliance, the mobility dimension between programs and levels exhibits regular compliance (47.9%). This suggests that efforts have successfully focused on creating new curricular routes and linking them with graduates. However, critical administrative barriers undermine the essence of flexible trajectories by hindering the recognition of studies and the transfer of credits.

The employability level of ESTP graduates in the La Libertad region is adequate (58.1% average). When analyzing its components, the acquisition of demanded competencies stands out as the most robust factor (62.4% at an adequate level), confirming the relevance of technical training. In contrast, job satisfaction presents the most critical scenario, with a high percentage of graduates performing at the deficient level (29.1%). This suggests that although the training is effective for technical placement, the training model is insufficient to provide graduates with the resilience and socio-emotional tools necessary for well-being and long-term fulfillment in the workplace.

The diverse range of training modalities significantly influences employability ($p < 0.01$) and has the greatest impact, demonstrating a high causal relationship ($\beta = 0.76$) and explaining 57% of the variance in the ESM. This high impact occurs because this dimension materializes the direct "Institute-Business" connection through models such as dual education and project-based learning (PBL). This connection ensures that the curriculum is synchronized with the demands of the productive sector in real time, guaranteeing the immediate relevance of the knowledge and skills acquired, which is highly valued by regional employers.

Guidance and counseling mechanisms significantly influence employability ($p < 0.01$)

with a high causal relationship ($\beta = 0.72$). This impact is justified because efficient monitoring and mentoring mechanisms reduce labor market asymmetry by acting as a bridge of information. By facilitating networking, postgraduate coaching, and providing updated information on job openings and soft skills requirements, the job placement process for graduates is accelerated, and they are more likely to find opportunities that align with their technical profile and salary expectations, thus improving the quality of the placement.

Mobility between programs and levels significantly influences employability ($p < 0.01$), though the causal relationship is medium ($\beta = 0.53$). However, its explanatory capacity is low (only 9.49% of R^2), reflecting a deficiency in operational implementation. This is due to bureaucratic rigidity in credit validation processes and the lack of standardization among ESTs hindering the execution of the policy, even though it is the norm. This administrative friction discourages graduates from capitalizing on their modular certifications or changing their training path, thus nullifying the competitive advantage that mobility should offer.

Public policies that allow for flexible educational trajectories significantly influence the acquisition of in-demand competencies ($p < 0.01$). This is because flexibility promotes the diversification of offerings, such as modular programs and adaptive curricula, allowing for the rapid incorporation of emerging technologies and digital skills into teaching. Thus, graduates acquire not only essential technical skills but also those required by Industry 4.0, ensuring a highly relevant and employable profile from the moment of graduation.

Public policies of flexible educational trajectories significantly influence the quality of employment ($p < 0.01$) with a high causal relationship ($\beta = 0.71$) and 51% explanatory power (R^2) in the ESM. This strong connection is based on the fact that flexible, relevant training increases the value of a graduate's human capital. Companies are willing to offer better working conditions (e.g., higher salary, formal contracts, and benefits) to professionals whose training has been proven in practical or dual environments. This certification

guarantees their immediate productivity and directly translates into higher-quality jobs.

Public policies that allow for flexible educational trajectories significantly influence job satisfaction ($p < 0.01$). However, the causal relationship is the weakest ($\beta = 0.44$), and flexible policies have the lowest explanatory power (19%) of all dimensions. This suggests that job satisfaction is mediated by non-curricular factors, such as organizational climate, work ethic, and the graduate's ability to manage frustration and stress. However, the model focuses on technical and instrumental productivity, neglecting comprehensive training and the development of purpose. This leaves graduates vulnerable to the pressures and conditions of the work environment, negatively impacting their fulfillment and permanence.

VI. Recommendations

Technical recommendations

To the servants of the Regional Education Management: It is recommended that you prioritize simplifying processes for mobility between programs and levels. Implementing an inter-institutional digital automatic credit recognition system (SDRAC) would reduce bureaucracy in validating and issuing modular certificates and degrees in a timely manner.

To career managers: Maintain and expand the diversified offer, focusing on ensuring the quality of dual education and internship agreements. Consider making an intensive internship semester a mandatory requirement for the degree.

To the staff of employability units: Strengthen the guidance and advice mechanisms by designing and implementing a centralized graduate monitoring platform (PCSE) that functions as a professional networking tool and provides curricular feedback to the EST.

To the education planning directorates: Establish a mechanism of incentives and strategic alliances with the private sector to promote exclusive job fairs and high-value certifications that directly impact the quality of employment of graduates (better positions and salaries).

To the curriculum design teams: Reformulate the

soft skills component to transition from a generic course to a cross-cutting strategy that integrates emotional management, resilience, and work purpose into all training modules to mitigate low job satisfaction.

Academic recommendations

To future researchers from La Libertad and Peru, It is recommended that you develop studies with a mixed (quantitative and qualitative) approach that are longitudinal in nature to better explain the 9.49% mobility rate. These studies should focus on identifying sociocultural and institutional barriers that hinder articulation (e.g., through focus groups with principals and teachers).

EST students in La Libertad are encouraged to conduct research on the validation of soft skills (e.g., resilience and emotional management) in the EST curriculum and their link to long-term job satisfaction.

To universities and institutes of technological higher education in La Libertad and throughout Peru, it is recommended that you carry out a

study evaluating the impact of job satisfaction that incorporates non-academic variables, such as organizational climate and employer leadership. The low R^2 (19%) suggests that the main cause does not lie solely in educational policy.

Policy recommendations

To the Ministry of Education:

It is recommended that a ministerial directive be issued to standardize and simplify the procedures for Credit Recognition (Validation) between public and private Institutes of Higher Technological Education (IEST) at the regional level. The objective of this directive is to eliminate bureaucratic barriers to mobility.

To the Regional Government of La Libertad:

It is recommended that the Graduate's Job Satisfaction be included as a mandatory and high-weight management indicator in the institutional operational plans and in the accreditation/licensing processes of the EST. This would ensure that comprehensive training and well-being are prioritized.

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