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Title: The influence that opening to change has on academic development in a public higher education institution

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Introduction

TECNOLÓGICOS DESCENTRALIZADOS
DE VERACRUZ

ITS TIERRA BLANCA

ITS SAN ANDRES TUXTLA

ITS POZA RICA

ITS TANTOYUCA

ITS MISANTLA

ITS HUATUSCO

ITS PANUCO

UTCV

ITS ZONGOLICA

IT MINATITALN

ITS XALAPA

ITS ALAMO TEMAPACHE ITS
ALVARADO
UTSV
UTGZ
ITS ACAYUCAN
ITS COSAMALOAPAN
ITS LAS CHOAPAS
ITS PEROTE
ITS MARTINEZ DE LA TORRE
ITS NARANJOS
ITS JESUS CARRANZA
ITS JUAN RODRIGUEZ CLARA
ITS CHICONTEPEC
UP HUATUSCO

INSTITUCIONES Y CENTROS

Tabla1. Instituciones y Centros

PLANTEL	TOTAL
INSTITUTOS TECNOLÓGICOS FEDERALES	126
INSTITUTOS TECNOLÓGICOS DESCENTRALIZADOS	122
CRODE	4
CIIDET	1
CENIDET	1
TOTAL	254

(2017). Instituciones y centros. México. Sistema Nacional de Estadística. Recuperado de http://sie.tecnm.mx

## DATOS GENERALES

No. de Institutos Tecnológicos y/o Centros	27	Matrícula de Educación Superior en el Estado	247,151	Proporción de la Matrícula del TecNM en el Estado con respecto a la Total del Estado	32.21%	Población en el Estado de 18 a 22 años	729,879
Matrícula total del TecNM	79,609	Oferta educativa del TecNM en el Estado (P.E.)	248			% de Cobertura de los Institutos Tecnológicos	10.8%

Tipo de Institución	Institución	P. E. de Licenciatura	P. E. de Posgrado	Total P.E.	Matrícula Licenciatura	Matrícula Posgrado	Mat. Total 2017-2018	% de Absorción	Egresados	PNPC	PBC	Pefil Deseable	SNI	Cuerpos Académicos
DESCENTRALIZADO	ACAYUCAN	10	0	10	4,251	0	4,251	89.70	387	0	1	5	1	1
DESCENTRALIZADO	ALAMO TEMAPACHE	7	0	7	2,167	0	2,167	73.45	278	0	1	7	0	4
DESCENTRALIZADO	ALVARADO	6	0	6	2,864	0	2,864	96.22	278	0	1	4	0	2
DESCENTRALIZADO	COATZACOALCOS	15	0	15	6,322	0	6,322	80.59	837	0	1	0	0	0
DESCENTRALIZADO	COSAMALOAPAN	11	0	11	2,338	0	2,338	91.55	257	0	0	4	0	1
DESCENTRALIZADO	CHICONTEPEC	3	0	3	437	0	437	75.23	52	0	0	0	0	0
DESCENTRALIZADO	HUATUSCO	7	0	7	2,861	0	2,861	94.16	273	0	2	15	2	6
DESCENTRALIZADO	JESÚS CARRANZA	4	0	4	1,370	0	1,370	95.09	93	0	0	0	0	0
DESCENTRALIZADO	JUAN RODRÍGUEZ CLARA	5	0	5	812	0	812	94.2	53	0	0	0	0	0
DESCENTRALIZADO	LAS CHOAPAS	11	0	11	2,040	0	2,040	89.04	245	0	0	2	0	0
DESCENTRALIZADO	MARTÍNEZ DE LA TORRE	5	0	5	1,001	0	1,001	92.33	226	0	0	0	0	0
DESCENTRALIZADO	MISANTLA	11	2	13	2,595	105	2,700	88.29	354	2	4	13	1	2
DESCENTRALIZADO	NARANJO	6	0	6	1,081	0	1,081	94.03	10	0	0	0	0	1
DESCENTRALIZADO	PÁNUCO	8	0	8	2,116	5	2,121	88.29	189	0	5	11	0	3
DESCENTRALIZADO	PEROTE	8	0	8	1,335	0	1,335	93.87	214	0	0	5	0	2
DESCENTRALIZADO	POZA RICA	11	3	14	5,346	58	5,404	85.89	820	2	0	16	2	4
DESCENTRALIZADO	SAN ANDRÉS TUXTLA	9	0	9	2,636	0	2,636	92.08	317	0	1	25	3	7
DESCENTRALIZADO	TANTOYUCA	9	2	11	2,181	46	2,227	84.01	324	1	0	12	1	4
DESCENTRALIZADO	TIERRA BLANCA	10	2	12	3,857	47	3,904	93.19	566	1	1	28	6	9
DESCENTRALIZADO	XALAPA	10	1	11	7,061	26	7,087	90.92	563	0	2	6	0	2
DESCENTRALIZADO	ZONGOLICA	5	0	5	2,288	0	2,288	100	256	0	4	2	0	5
FEDERAL	BOCA DEL RÍO	10	3	13	2,528	75	2,603	56.78	237	3	0	10	8	2
FEDERAL	CERRO AZUL	11	0	11	2,955	0	2,955	84.48	442	0	3	16	0	3
FEDERAL	MINATITLÁN	8	1	9	4,431	10	4,441	74.09	555	0	1	10	1	0
FEDERAL	ORIZABA	9	6	15	5,437	196	5,633	66.15	823	6	8	53	19	12
FEDERAL	URSULO GALVÁN	5	0	5	1,094	0	1,094	90.62	148	0	3	18	3	4
FEDERAL	VERACRUZ	11	3	14	5,537	100	5,637	56.03	616	2	2	35	22	10

|														
Subtotal Federales y/o Centros		6	54	13	67	21,982	381	22,363	72.96	2,821	11	17	142	53	31
Subtotal Descentralizados		21	171	10	181	56,959	287	57,246	89.63	6,592	6	23	155	18	53
Total		27	225	23	248	78,941	668	79,609	82.60	9,413	17	40	297	71	84

Tabla No. 1.Comparativo de indicadores de desarrollo académico en Tecnológicos del estado de Veracruz

Perfil Deseable en el Sistema de Educación Tecnológica en el estado de Veracruz
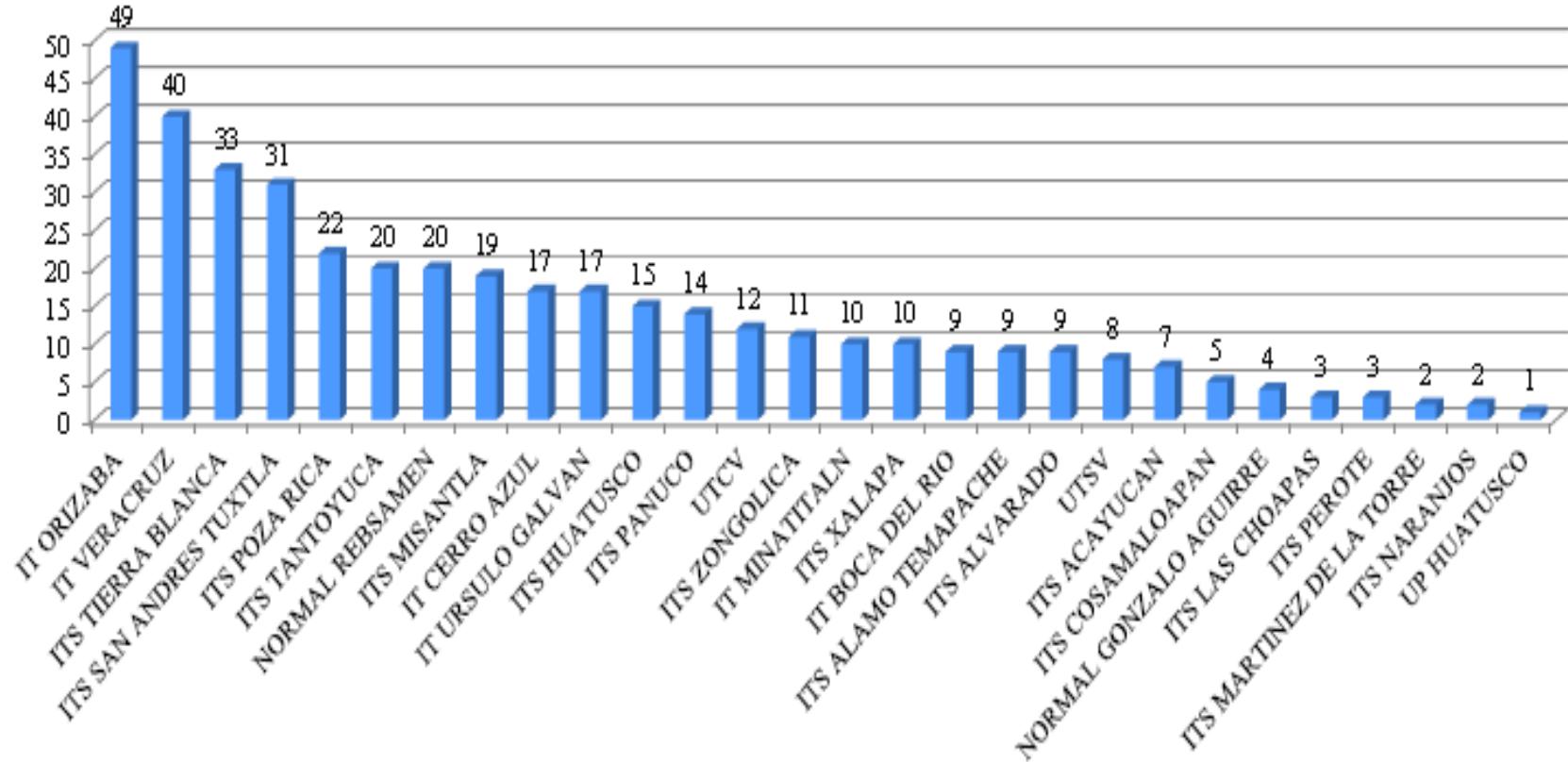
Cuerpos Académicos en Formación en Sistema de Educación Tecnológica en el Estado de Veracruz
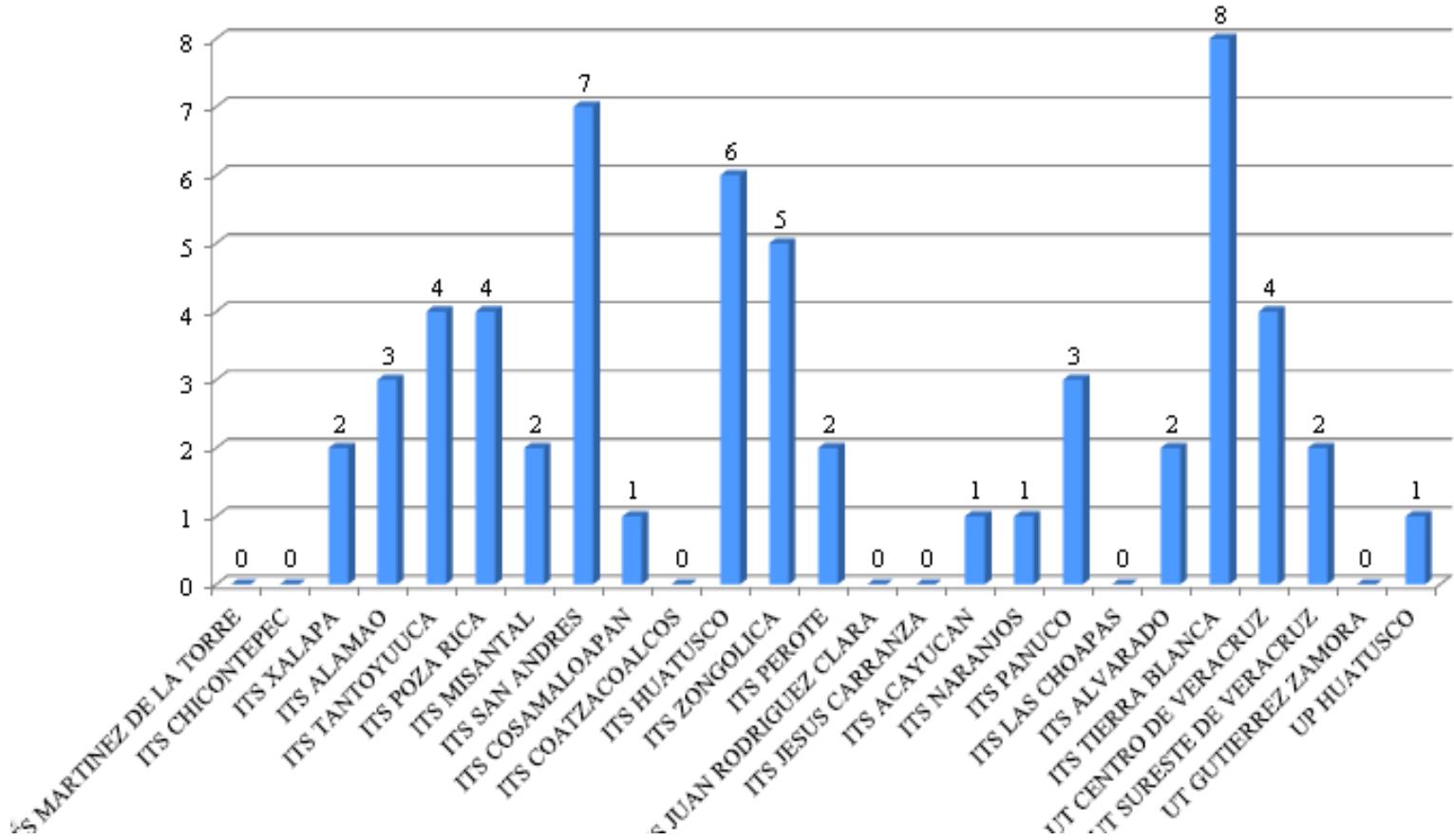
Cuerpos Académicos Consolidados en el Sistema de Educación Tecnológica en el Estado de Veracruz
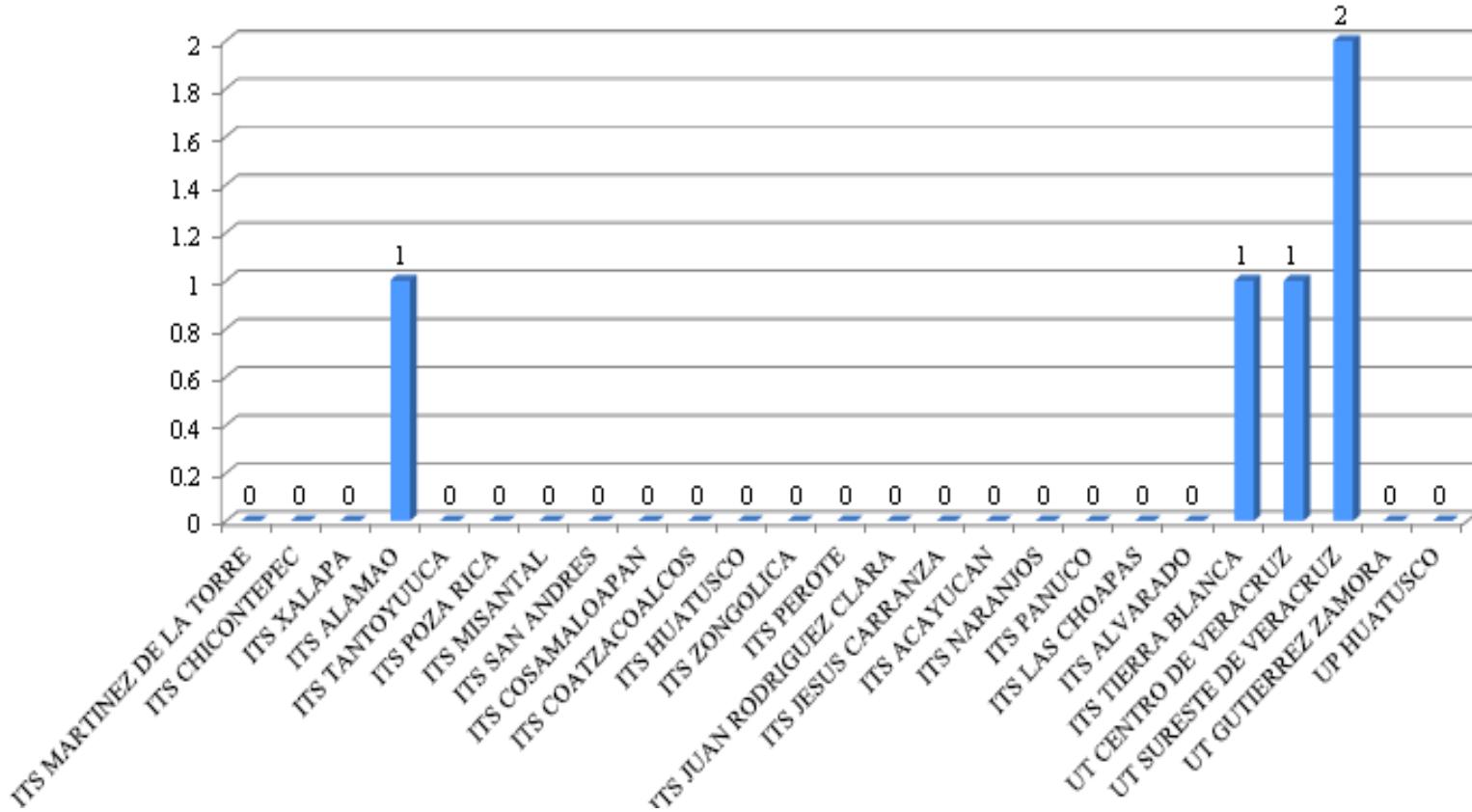
Indicadores institucionales ITSH

INDICADOR	PROGRAMAS EDUCATIVOS OFICIALES																	
	ING. INDUSTRIAL		ING. EN INDUSTRIAS ALIMENTARIAS		ING. ELECTROMECANICA		ING. EN SISTEMAS COMPUTACIONALES		ING. EN GESTIÓN EMPRESARIAL		CONTADOR PUBLICO		ING. AMBIENTAL		ING. INDUSTRIAL (ABIERTO)		ING. EN SISTEMAS COMPUTACIONALES	
	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M
AGOSTO 2018 - ENERO 2019																		
DOCENTES FRENTE A GRUPO	7	5	5	7	5	2	7	2	6	3	3	6	2	1	4	0	2	0
DOCENTES EN CURSO DE FORMACIÓN	6	5	1	6	5	2	6	2	5	4	3	5	2	1	3		1	0
DOCENTES EN CURSO DE ACTUALIZACIÓN	6	5	1	6	5	2	6	2	5	4	3	5	1	1	3	0	1	0
DOCENTES CON NIVEL ACADÉMICO DE POSGRADO	6	1	3	4	2	2	5	0	2	2	1	2	2	1	2	0	1	0
DOCENTES PARTICIPANTES EN PROGRAMAS DE ESTÍMULO	6	1	3	4	2	2	5	2	3	3	0	2	2	0	2	0	1	0
DOCENTES BENEFICIADOS EN PROGRAMAS DE ESTIMULOS	5	1	3	2	2	2	5	2	3	3	0	2	1	0	2	0	1	0
FEBRERO- JULIO 2019																		
DOCENTES FRENTE A GRUPO	7	5	6	6	5	2	8	3	6	3	3	7	3	1	4	0	3	1
DOCENTES EN CURSO DE FORMACIÓN	7	5	3	5	6	2	7	2	6	3	3	6	2	1	3	0	3	0
DOCENTES EN CURSO DE ACTUALIZACIÓN	7	5	4	4	6	2	7	1	5	2	2	6	2	1	2	0	1	0
DOCENTES CON NIVEL ACADÉMICO DE POSGRADO	6	3	3	3	2	2	7	1	4	3	1	4	3	1	1	0	2	1
DOCENTES PARTICIPANTES EN PROGRAMAS DE ESTÍMULO	6	1	3	4	2	2	5	2	3	3	0	2	2	0	2	0	1	0
DOCENTES BENEFICIADOS EN PROGRAMAS DE ESTIMULOS	5	1	3	2	2	2	5	2	3	3	0	2	1	0	2	0	1	0
DOCENTES EVALUADOS EN PERIODO FEBRERO - JULIO 2019	7	5	6	6	5	2	8	3	6	3	3	7	3	1	4	0	3	1
AGOSTO 2019- ENERO 2020																		
DOCENTES FRENTE A GRUPO	7	5	6	6	7	2	8	3	6	3	3	7	3	1	4	0	2	1
DOCENTES EN CURSO DE FORMACIÓN	6	5	4	5	3	2	8	3	5	3	3	6	2	0	1	1	1	1
DOCENTES EN CURSO DE ACTUALIZACIÓN	5	3	4	6	3	1	8	3	5	3	3	5	3	1	3	0	2	1
DOCENTES CON NIVEL ACADÉMICO DE POSGRADO	6	2	3	3	2	2	6	1	5	3	1	4	3	1	1	0	1	1
DOCENTES PARTICIPANTES EN PROGRAMAS DE ESTÍMULO	7	2	2	3	4	2	5	1	3	1	1	1	2	1	0	0	1	0

Methodology

Objective

Determine the relationship between openness to change in academic development in a public HEI.

Hypothesis

Openness to change influences academic development

Design of the investigation

Quantitative

not experimental

cross

Conceptualization of independent variable, openness to change

Conceptual definition	Chosen element
Openness to change is generated by the strategic orientation factors of companies. The need for change generally begins with the redefinition of the strategic direction, thereby affecting the organizational structure, processes and procedures, which in essence transcends to affect the basic values, beliefs, habits and the system of meanings, this is, the culture of the company (González and Hernández, 2007).	Habits
The challenges of higher education must be associated with the government policies of the countries that are also subject to the determinations of the State reform. This supposes in the teacher an attitude of openness to change. (Palencia, 2006).	Educational policies
The concept of openness to change by Finkelstein and Hambrick (1996) has been treated by the strategic literature, linked to cognitive elements such as expectations, performance patterns, professional and social projects.	Professional Projects
Strategic change is more likely to be successful when there is (empowerment) motivation of people, that is, they are given the possibility of giving their opinion on the change process, the assumptions that make it necessary and the possible results (Lines, 2004).	Motivation

Table Conceptualization of independent variable, Openness to Change. Own source.

Dependent variable, Academic development.

Academic development is the validity and professional updating in the various areas of the work of academics, seeing updating as the renewal of knowledge or new topics inherent to the training profile of each teacher (Donoso, 2018).

Professional update

The desirable academic profile in the teacher represents the level of academic development, that is, an "integral academic" that develops, at the same time, teaching activities, student tutoring, research and bonding. Where linking is an activity to support teaching that allows collaboration between the higher education institution and the government, business and / or social sectors, benefiting both actors through the direction and collaboration of integrative projects (Urbano, Aguilar and Rubio , 2006).

Bonding

Academic development occurs from teacher training and development as a result of strategies aligned between national development policies, science and technology strategies, and teacher training and development policies, on a continuous and permanent basis. Teacher training is a continuous process of didactic-pedagogical learning (Donoso, 2018).

Training

Academic development in teachers requires a change, a significant adjustment in roles to follow the international trend, research-oriented teachers individually or collegially publishing and disseminating facts or knowledge (Goodlad and Holmes, 1995).

Investigation

Tutoring is considered by Vázquez, García, and Oliver (2008), as an integral activity in academic development, a process of accompaniment during the training of students, which is specified through personalized attention to a student or a small group of them by competent and trained academics for this function, counseling can also be mentioned as a follow-up to the student or orientation related to the professional profile of the student.

Tutorships

Shows

The teachers who work at the Higher Technological Institute are 70 of which are subdivided into 7 academies. Therefore, a sample of 55 teachers from the Higher Technological Institute must be made, with a confidence level of 95% and a tolerance of 5%.

Statistical treatment

I dealt with the Pearson correlation test to contrast the hypothesesThe chi-square independence test was used to identify the relationship between the variables indicators (items)

Results

Instrument reliability test (questionnaire)

Estadísticos de fiabilidad

Alfa de Cronbach	N de elementos
.955	57

To determine the degree of reliability of the instrument used, the alpha Cronbranch test was used through the item variance method (Cordova, 2009). A pilot test was applied to 15 people with 57 items.

	ESCALA	CATEGORIA
	$r = 1$	Confiabilidad perfecta
	$0.90 \leq r \leq 0.99$	Confiabilidad muy alta
	$0.70 \leq r \leq 0.89$	Confiabilidad alta
	$0.60 \leq r \leq 0.69$	Confiabilidad aceptable
TABLA DE CATEGORIAS	$0.40 \leq r \leq 0.59$	Confiabilidad moderada
	$0.30 \leq r \leq 0.39$	Confiabilidad baja
	$0.10 \leq r \leq 0.29$	Confiabilidad muy baja
	$0.01 \leq r \leq 0.09$	Confiabilidad despreciable
	$r = 0$	Confiabilidad nula

Fuente: Andrew, Pedersen, & McEvoy, 2019

Results

Parametric test

Ho: The variable academic development (DV) in the population has a normal distribution

H1: The variable academic development (DV) in the population is different from distribution

	Pruebas de normalidad					
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Estadístico	gl	Sig.	Estadístico	gl	Sig.
Desarrollo académico	.091	55	.200*	.983	55	.613
Apertura cambio	.077	55	.200*	.977	55	.365
*. Este es un límite inferior de la significación verdadera.						
a. Corrección de la significación de Lilliefors						

Resultados de traducción

As the significance level is greater than 0.05, the null hypothesis is accepted; therefore, the variable academic development (DV) in the population has a normal distribution. Therefore, for the correlation analysis, the Pearson test will be applied

Hypothesis verification

General hypothesis
H1 = βopening_to_change ≠ 0

The correlation between the population is different from zero, that is, openness to change influences academic development.

Correlaciones

		Motivacion	Habitos	Proy_Profes	Polit_educat	Vinculación	Formación	Tutorías	Investigación	Apertura_cambio	Desarrollo_academico
Motivacion	Correlación de Pearson	1	.564**	.637**	.719**	.530**	.476**	.436**	.672**	.862**	.719**
	Sig. (bilateral)		.000	.000	.000	.000	.000	.001	.000	.000	.000
	N	55	55	55	55	55	55	55	55	55	55
Habitos	Correlación de Pearson	.564**	1	.536**	.615**	.454**	.277*	.346**	.431**	.717**	.522**
	Sig. (bilateral)	.000		.000	.000	.000	.041	.010	.001	.000	.000
	N	55	55	55	55	55	55	55	55	55	55
Proy_Profes	Correlación de Pearson	.637**	.536**	1	.811**	.512**	.188	.180	.508**	.892**	.490**
	Sig. (bilateral)	.000	.000		.000	.000	.170	.188	.000	.000	.000
	N	55	55	55	55	55	55	55	55	55	55
Polit_educat	Correlación de Pearson	.719**	.615**	.811**	1	.615**	.295*	.279*	.559**	.936**	.613**
	Sig. (bilateral)	.000	.000	.000		.000	.029	.039	.000	.000	.000
	N	55	55	55	55	55	55	55	55	55	55
Vinculación	Correlación de Pearson	.530**	.454**	.512**	.615**	1	.300*	.283*	.564**	.619**	.777**
	Sig. (bilateral)	.000	.000	.000	.000		.026	.036	.000	.000	.000
	N	55	55	55	55	55	55	55	55	55	55
Formación	Correlación de Pearson	.476**	.277*	.188	.295*	.300*	1	.447**	.354**	.358**	.676**
	Sig. (bilateral)	.000	.041	.170	.029	.026		.001	.008	.007	.000
	N	55	55	55	55	55	55	55	55	55	55
Tutorías	Correlación de Pearson	.436**	.346**	.180	.279*	.283*	.447**	1	.365**	.347**	.695**
	Sig. (bilateral)	.001	.010	.188	.039	.036	.001		.006	.009	.000
	N	55	55	55	55	55	55	55	55	55	55
Investigación	Correlación de Pearson	.672**	.431**	.508**	.559**	.564**	.354**	.365**	1	.640**	.781**
	Sig. (bilateral)	.000	.001	.000	.000	.000	.008	.006		.000	.000
	N	55	55	55	55	55	55	55	55	55	55
Apertura_cambio	Correlación de Pearson	.862**	.717**	.892**	.936**	.619**	.358**	.347**	.640**	1	.682**
	Sig. (bilateral)	.000	.000	.000	.000	.000	.007	.009	.000		.000
	N	55	55	55	55	55	55	55	55	55	55
Desarrollo_academico	Correlación de Pearson	.719**	.522**	.490**	.613**	.777**	.676**	.695**	.781**	.682**	1
	Sig. (bilateral)	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	55	55	55	55	55	55	55	55	55	55

**. La correlación es significativa al nivel 0,01 (bilateral).

*. La correlación es significante al nivel 0,05 (bilateral).

Individual hypotheses

Correlaciones

		Desarrollo_academico	Motivacion	Habitos	Proy_Profesional	Polit_educat
Desarrollo_academico	Correlación de Pearson	1	.719**	.522**	.490**	.613**
	Sig. (bilateral)		.000	.000	.000	.000
	N	55	55	55	55	55
Motivacion	Correlación de Pearson	.719**	1	.564**	.637**	.719**
	Sig. (bilateral)	.000		.000	.000	.000
	N	55	55	55	55	55
Habitos	Correlación de Pearson	.522**	.564**	1	.536**	.615**
	Sig. (bilateral)	.000	.000		.000	.000
	N	55	55	55	55	55
Proy_Profesional	Correlación de Pearson	.490**	.637**	.536**	1	.811**
	Sig. (bilateral)	.000	.000	.000		.000
	N	55	55	55	55	55
Polit_educat	Correlación de Pearson	.613**	.719**	.615**	.811**	1
	Sig. (bilateral)	.000	.000	.000	.000	
	N	55	55	55	55	55

**. La correlación es significativa al nivel 0,01 (bilateral).

Hipótesis	Interpretación de resultados
$H_1 = \beta_{\text{Motivación}} \neq 0$ **La motivación influye en el desarrollo académico**	r= 0.719 Valor de significancia= 0.000 La motivación tiene una relación positiva fuerte con el desarrollo académico. Como el valor de significancia es de 0.000 < 0,05 rechazamos la hipótesis nula y la hipótesis alternativa no es rechazada.
$H_2 = \beta_{\text{Hábitos}} \neq 0$ **Los hábitos influye n en el desarrollo académico**	r= 0.522 Nivel de significancia= 0.01 Existe una relación positiva media entre los hábitos y el desarrollo académico. Como el valor de significancia es de 0.000 < 0,05 rechazamos la hipótesis nula y la hipótesis alternativa no es rechazada.

$H_1 = \beta_{Proyecto\_profesionales} \neq 0$ **El proyecto profesional influye en el desarrollo académico**	**r= 0.490** **Nivel de significancia= 0.01** **Existe una relación positiva media entre el proyecto de vida y el desarrollo académico,** **Como el valor de significancia es de 0.000 < 0,05 rechazamos la hipótesis nula y la hipótesis alternativa no es rechazada.**
$H_1 = \beta_{Proyecto\_vida} \neq 0$ **Las políticas educativas influyen en el desarrollo academico**	r= 0.613 Nivel de significancia= 0.01 N= 55 Existe una relación positiva media entre los hábitos y el desarrollo académico. Como el valor de significancia es de 0.000 < 0,05 rechazamos la hipótesis nula y la hipótesis alternativa no es rechazada.

Apertura al cambio

Motivación

Hábitos

Proyectos profesionales

Políticas Educativas

Desarrollo académico

Vinculación

Formación

Tutorías

Investigación

0.000
0.000
0.000
0.000
0.000
0.041
0.029
0.001
0.001
0.010
0.089
0.000
0.000
0.000
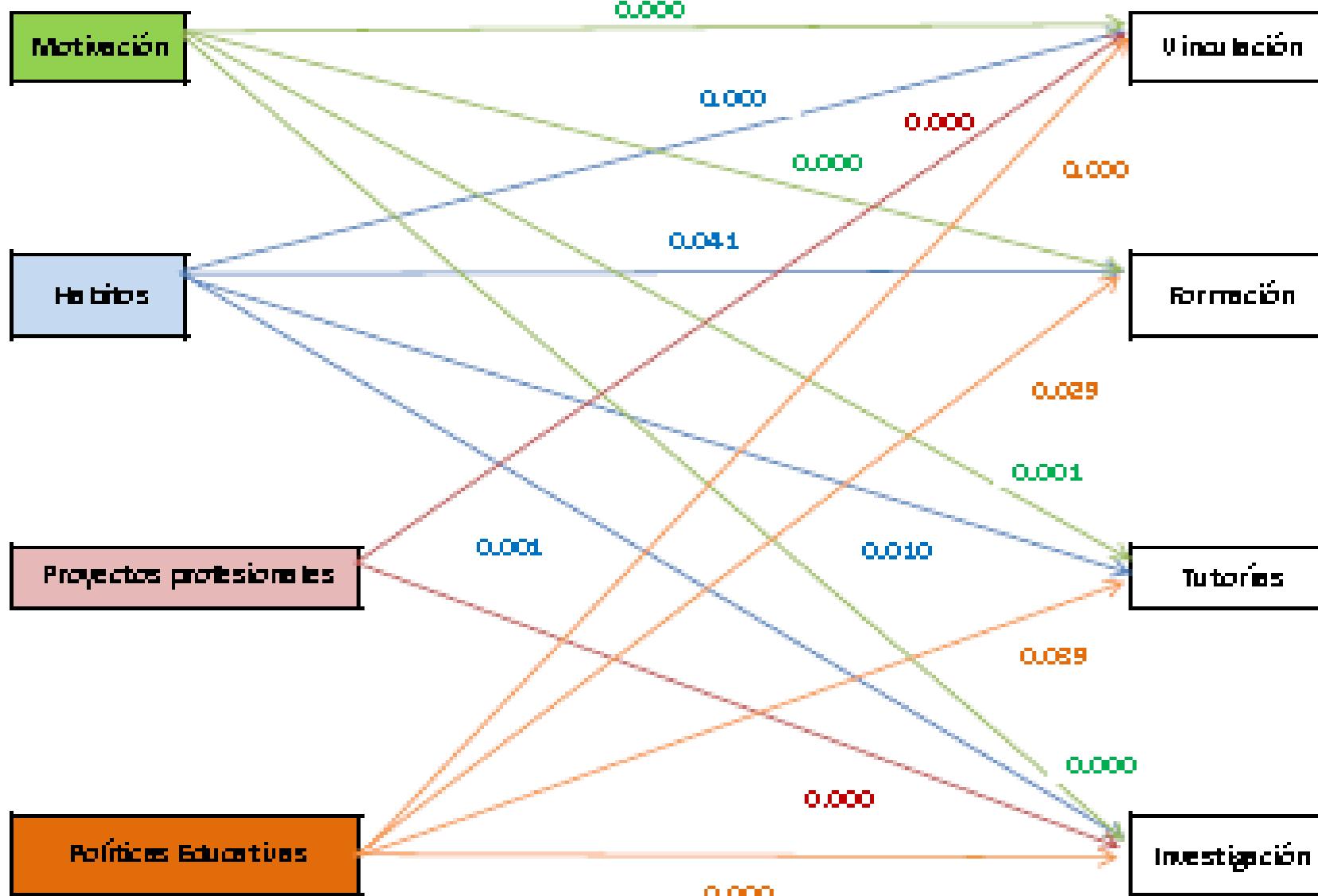
CORRELACION DE PEARSON
Significancia Bilateral

RESUMEN DEL MODELO

Tabla A Resumen del modelo				
Modelo	R	R cuadrado	R cuadrado corregida	Error típ. de la estimación
1	0.742ᵃ	0.551	0.515	8.69410
a. Variables predictoras: (Constante), Motivacion, Habitos Proy_Profesional, Polit_educat,				

Los predictores representan el 55% de la varianza en el significado en las puntuaciones del desarrollo académico.

Las variables independientes (motivación, hábitos, Proyectos profesionales y las políticas educativas) explican, el 55.1% de la variación del desarrollo académico. En otras palabras, 44.9% de la variación se debe a otras fuentes

TABLA DE ANOVA

De la tabla de anova el p-valor es menor que 0.05, la regresión general modelo (con todos los predictores incluidos) es significativo

ANOVA[a]

Modelo		Suma de cuadrados	gl	Media cuadrática	F	Sig.
1	Regresión	4638.163	4	1159.541	15.340	.000[b]
	Residual	3779.365	50	75.587		
	Total	8417.527	54			

a. Variable dependiente: Desarrollo_academico

b. Variables predictoras: (Constante), Polit_educat, Habitos, Motivacion, Proy_Profesional

Conclusions

It was identified that with a probability of error of 0.00 there is an influence between openness to change and academic development, likewise it was determined that openness to change has a medium positive correlation in the academic development of public HEI.

It was determined that motivation has a strong positive relationship with academic development, on the basis that the significance value is 0.00 less than 0.05, with a relationship of the influence that motivation has on openness to change.

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