

Organizational culture and competitiveness in the Faculty of Chemistry and Chemical Engineering at the UNMSM, Peru, 2020

[Cultura organizacional y competitividad en la Facultad de Química e Ingeniería Química de la UNMSM, Perú, 2020]

José Angel Porlles Loarte  *

Universidad Nacional Federico Villarreal, Lima, Perú

* joseporlles@gmail.com

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Resumen

La presente investigación es mixta; en el enfoque cualitativo el propósito es entender el grado de comprensión de las creencias subyacentes de los trabajadores administrativos en su percepción de la Imagen Institucional de la cultura organizacional (CO), y desde la perspectiva cuantitativa evaluar el grado de relación existente entre los constructos CO y competitividad. Para conceptualizar la CO se consideró la teoría del comportamiento organizacional, y en cuanto a la competitividad, el enfoque del World Economic Forum (WEF). En el marco metodológico, como unidad de análisis se tomó una Facultad de la Universidad Nacional Mayor de San Marcos, Lima, Perú. En el análisis cuantitativo se consideró una muestra de 294 personas, seleccionada al azar, siendo el estudio correlacional, transversal, aplicativo y de diseño no experimental; se aplicó un cuestionario con 21 ítems, cuyos datos se procesaron en el programa estadístico SPSS versión 25, validando su confiabilidad interna para ambas variables (alfa de Cronbach: 0,932), la validez de contenido vía juicio de expertos y la validez del constructo vía el análisis factorial exploratorio (AFE). El estudio cualitativo fue exploratorio y con diseño fenomenológico con una muestra de 9 personas, usando la entrevista semiestructurada. Los resultados para el análisis descriptivo revelaron que el 93 % de la muestra estimó importante la CO en el entendimiento de la competitividad. Contrastando la hipótesis general, resultó una alta significancia estadística entre ambos constructos (p -valor = 0,000), y correlación positiva (Spearman 0.718). Las pruebas de las hipótesis específicas mostraron el mismo patrón de resultados. El análisis de varianza (ANOVA) reafirmó que la CO es capaz de interpretar cerca del 52.2 % del constructo competitividad.

Palabras clave: Cultura organizacional, competitividad, calidad educativa, liderazgo.

Abstract

This research is mixed; In the qualitative approach, the purpose is to understand the degree of understanding of the underlying beliefs of the administrative workers in their perception of the Institutional Image of the organizational culture (OC), and from the quantitative perspective to evaluate the degree of relationship between the OC constructs and competitiveness. To conceptualize OC, the theory of organizational behavior was considered, and regarding competitiveness, the approach of the World Economic Forum (WEF). In the methodological framework, a Faculty of the Universidad Nacional Mayor de San Marcos, Lima, Peru was taken as the unit of analysis. In the quantitative analysis, a randomly selected sample of 294 people was considered, the study being correlational, cross-sectional, applicative and with a non-experimental design; a questionnaire with 21 items was applied, whose data were processed in

the statistical program SPSS version 25, validating its internal reliability for both variables (Cronbach's alpha: 0.932), content validity via expert judgment and construct validity via the exploratory factor analysis (EFA). The qualitative study was exploratory and with a phenomenological design with a sample of 9 people, using the semi-structured interview. The results for the descriptive analysis revealed that 93% of the sample considered OC important in understanding competitiveness. Contrasting the general hypothesis, a high statistical significance was found between both constructs (p -value = 0.000), and a positive correlation (Spearman 0.718). The tests of the specific hypotheses showed the same pattern of results. The analysis of variance (ANOVA) reaffirmed that the OC is capable of interpreting about 52.2% of the competitiveness construct.

Keywords: Organizational culture, competitiveness, educational quality, leadership.

1. Introduction

Specialists argue that we are in the perspective of the third generation of higher education centers or universities (HEI), which have emerged in the high higher education scenario, and due to their ability to influence, as well as modify change, development social, scientific, technological and economic, constitutes one of the most relevant segments of international competition; As a result, HEIs are forced to make frequent changes in their main purpose, scope and organization (Köse et al., 2019, pp.1-2). Universities have become a lever for development; As mentioned by UNESCO (2009), higher education and research help to eradicate poverty, promote sustainable development and achieve internationally agreed goals, also in this same conference the responsibility of higher education is highlighted as understanding and to face economic, cultural, social and scientific problems, to promote critical thinking and active citizenship, and it must be ensured by the interested entities, in particular the governments. In this context, strengthening the competitive capacity of HEIs assumes strategic importance; in this regard, as demonstrated in the specialized literature, OC can contribute to creating a competitive advantage in universities.

On this aspect, Mathew (2018) critically reflects on the theoretical links between OC and effectiveness (which means university competitiveness), and found that different culture options of an institution, although they project many values, affect performance in different ways; concludes that adequate cultures are a prerequisite in achieving effectiveness. In line with the above, Taye et al. (2019, p.77) reaffirmed in their case study in a renowned university in Beijing, China, that many of the elements that constitute the OC have an important influence on the global performance of universities.

The OC represents a common perception of the workers of an organization; expect that people with different backgrounds or different positions in the organization will tend to describe OC in similar terms; likewise, understanding the origin of an entity's culture helps to explain and understand the behavior of its workers and the way its members perceive the characteristics of their own culture; not if they like it, which is relevant because it distinguishes between culture and job satisfaction; As the specialists point out, the measurement of the way in which people see their institution is part of the research on OC (Robbins et al., 2017, pp. 527-528). The World Economic Forum (WEF, 2019) analyzes the competitiveness of nations subject to achieving significant levels of productivity, which depends on the proper functioning of institutions, policies and relevant factors, highlighting that said parameter is a condition to achieve greater progress in a nation.

Organizational Culture (OC)

In the literature, the conceptualization of the meaning of OC is very broad; it is postulated as a model of basic assumptions, discovered or developed by the members of an organization and as Schein (2004, p.17) establishes, it is the product of learning by facing problems in an interrelated context with internal and external forces, and that these adaptations, applying good judgment,

can be considered valid and therefore taught to new members as the correct way to perceive, think and feel these problems, which means, configure online behavior for the purposes of the organization. Likewise, the effects of culture are profound; culture can be analyzed at three levels, as highlighted by Schein (2004, pp. 25-36), the level term being the degree to which the cultural phenomenon is visible to the observer; the first contact is with the artifacts that become visible and tangible; and schematized, because people within the company seem to act in the same way with an already established behavior. In this regard, it proposes a model of culture widely recognized in the social sciences and academic centers, which can be seen in Figure 1: creation and production are established at the most visible level, values at the middle level, and values at the highest level. deepen the basic assumptions.

For Schein (2004) and Chiavenato (2017, p. 305), the OC becomes a set of shared values, habits, uses and customs, codes of conduct, work policies, traditions and objectives that are transmitted from one generation to the next. other; (...) adopt their cultural patterns of habits and beliefs embodied through norms, values, attitudes and expectations shared by all individuals in the organization (...). According to Schein (2004, pp. 12-13) the majority of observable categories associated with culture are: i) common behaviors of interaction: the customs and traditions, rituals that they employ; (this means that it corresponds to artifacts, corporate image); ii) group norms (this means particular work norms and regulations); iii) shared values: this means principles and values that the group claims to try to achieve; iv) formal philosophy: policies and ideological principles that guide the actions of the group towards the owners, employees, clients and other interest groups (this means that it corresponds to having a vision, goals and objectives); v) the rules of the game (this means, rules for new members to adapt to...). Also, Schein (2004, p. 11) affirms that culture and leadership are two sides of the same coin; none of them can be understood separately; since said author postulates: the leader creates and builds the culture.

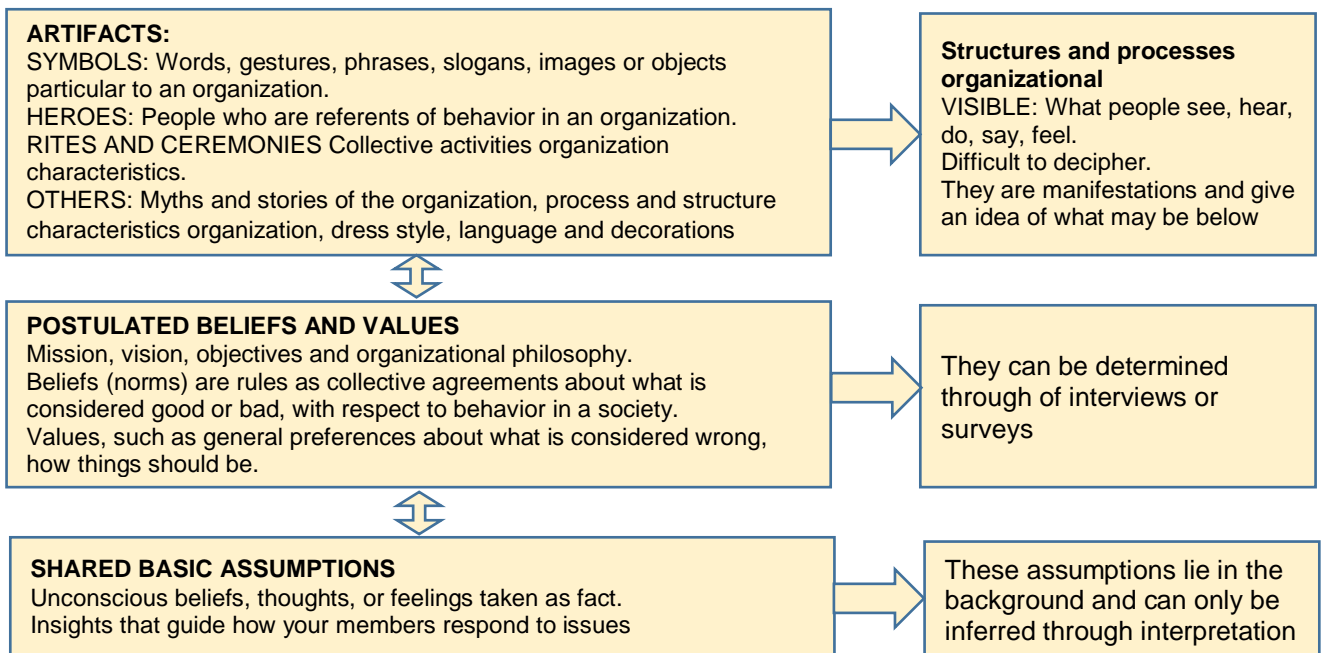


Figure 1. Levels of culture and the approach for their study.
Source: Schein (2004, p.26)

From another perspective, it is explained that there is a similarity of the OC with an iceberg, and presents several levels with different degrees of depth and roots: in terms of formal and open aspects (what is visible and publicly observable) it includes: objectives and strategies, personnel work policies and guidelines, work methods and procedures, among others; plane of informal and hidden aspects: perceptions and attitudes of people, values and expectations, norms of formal infractions, affective relationships (Chiavenato, 2017, pp. 305-307).

In the Rhema model, a OC model for Latin American universities linked to quality, and according to its appreciation, it incorporates components widely used in various works, which are: institutional image, institutional philosophy (meaning strategic direction), leadership, policies, standards and regulations, interpersonal relationships, and communication (Llanos, 2018, p. 50). Moreno et al. (2019, p. 118) in their study on OC and teaching performance in HEIs, incorporate interpersonal relationships, teamwork and institutional communication as dimensions of OC.

University competitiveness.

The Forum of the Social Councils of the public universities of Andalusia, Spain (2009, p. 8) also referred that the competitiveness of the universities can be defined as: "the capacity to successfully achieve its institutional mission, (...); trying to approach it from the perspective of knowledge and innovation; From another perspective, they define competitiveness as the ability to: "contribute to the sustainable improvement of the population's quality of life through knowledge and innovation." SINEACE (2017) in the Institutional Accreditation Model for Universities of Peru, establishes certain standards linked to this research work, such as: Mission and policies, mobility and internationalization, Quality Management system, Curriculum management, Intellectual property and copyrights. author, dissemination of R+D+I and teaching career; which means that they give sustainability to the present study, for being components as indicators, of the variables under study.

On the world rankings Agassisti & Pérez-Esparrells (2009), cited by Esquinca et al. (2019, p. 25), as well as Tomás et al. (2015, p. 35), consider that the HEI rankings have the purpose of establishing a hierarchy of quality merit and refers to the quality offered by an HEI in the globalized context, referring to competitiveness, including among other parameters, the institutional image, national and international mobility of teachers and students, scientific production, levels of development. Likewise, Blagireva (2015, p. 908) suggests the definition of university competitiveness, as a general characteristic (over a particular period of time, labor market conditions, and conditions for carrying out defined educational services), reflecting its priority over competitive universities. in educational services. Some specialists maintain that there are still no uniform methodologies to measure the competitiveness of HEIs, since it is difficult to cover the factors that have a significant impact on this multidimensional economic category (Dimitrova et al., 2017). To appreciate the practical importance of measuring competitiveness, its measurement of HEIs in sixteen Latin American countries was examined based on data from the WEF for the period 2011-2017, reviewing the eight WEF indicators for higher education, finding that there is a correlation between the competitiveness of HEIs with general competitiveness (López-Leyva, 2020, p. 165 and 175).

The problem in the National University of San Marcos (UNMSM).

This HEI has a worrying institutional competitive position that is reflected in a low effectiveness or university competitiveness in relation to other emblematic HEIs in Latin America that is reflected in the university rankings (as is the case of QS Latin America University Rankings 2020-2022), caused in part by limitations in the solidity of the organizational culture in the San Marcos community. These shortcomings at the university level are also reflected in the 20 faculties it has. On the side of the possible inducers, there are shortcomings in: articulation of the system of policies, rules and regulations, strategic direction, leadership, communications, interpersonal relationships, institutional image, which in general configure the deterioration of the competitive

position of the university. On the side of the possible results, there are: difficulties in strengthening educational quality (apart from the budget limitations to deal with the expansion of the educational offer and the improvement of laboratories, greater teacher participation is required to contribute to the improvement requirements). in the teaching-learning system and approach and execution of decisions to reverse the problem in the faculties and in the Institution); limitations in scientific production (of the 20 faculties, most do not have indexed journals, and although there is research carried out, few have become innovations); serious difficulties in making feasible with sustainability the mobilization of teachers and students to foreign universities. This low level of competitiveness at UNMSM is also seen in the Faculty of Chemistry and Chemical Engineering (FQIQ), which is the unit of analysis in this research. Under the systemic criterion "the behavior of the elements and their effects on the whole are interdependent" (Nieto, 2013, p. 125), so it is assumed that what happens at a global level is reflected in said Faculty.

The analysis proposal

For the OC variable, the Rhema Model of Llanos (2018) and other contributions in the literature have been taken as a reference; while on the side of competitiveness, a contribution has been made by collecting various approaches to assess university competitiveness, considering: more visible concepts for its measurement: educational quality, scientific production and internationalization. The projection is that the findings allow the design of strategies aimed at sensitizing the members of the University of San Marcos, deepening the analyzes in the other faculties and at the level of the central administration; In addition, carry out other actions, such as the diagnosis using the aforementioned constructs, establish and propose changes and organizational development with perspectives to align the behavior and conduct of teachers, administrators and students. If mechanisms for improvement in the OC and in university competitiveness do not materialize, the forecast projects that the unit of analysis and the UNMSM will continue to make slow progress, with the risk that the gap between the OC and competitiveness increases compared to other HEIs, or become more critical, with a negative effect on their performance and restrictions on their contribution to the social and economic development of the nation.

Therefore, in the quantitative approach, the general problem is: How is the OC related to the competitiveness of the Faculty of Chemistry and Chemical Engineering (in Spanish, FQIQ)? and the specific problems are: How is the strategic direction with the competitiveness of the FQIQ? How are the rules and regulations related to the competitiveness of the FQIQ?, How is leadership related to the competitiveness of the FQIQ?, How is it related communication with the competitiveness of the FQIQ? How are interpersonal relationships related to the competitiveness of the FQIQ? How are the dimensions of the organizational culture variable related to the dimensions of the competitiveness variable of the FQIQ? Likewise, from the quantitative approach, the general objective is: To establish how the CO is related to the competitiveness of the FQIQ; and in the qualitative approach the general objective is: To understand the degree of understanding of the underlying values and beliefs of the administrative workers through their perception of the Artifacts component of the institutional image in the OC of the FQIQ, to understand the manifestations of the institutional image component, as part of the OC construct, in order to approach reality in an approximate way, since the subject has not been explored, at least in the areas of the UNMSM.

2. Materials and Methods

The quantitative study is based on objectivity, with formulations of specific hypotheses that reflect a problem, applying statistical sciences to obtain research findings. Deductive reasoning has been used to understand the phenomena under study (Hernández et al., 2014, p. 20), for which the following activities were followed: the problem was characterized taking into account the theoretical and conceptual framework, the operationalization of the variables and the data capture

instrument were designed, specifying the scope and typology of the study, the population and sample size were defined, the reliability and validity of the aforementioned instrument were analyzed, the normality of the information obtained was defined and the correlation statistic to be used, and finally the hypothesis testing and analysis of results were carried out.

Quantitative research is applicative due to its purpose, in the perspective that the reference framework proposed as a OC model can be replicated in other faculties not only of the UNMSM, but also in the remaining national HEIs and allows the design of strategies to propose organizational changes; it is transactional since information is captured in a single moment, since the objective is to interpret the phenomenon and analyze the interrelation of its components in those circumstances (Hernández et al., 2014, p. 151); is correlational given that the focus of the work is to analyze the degree of correlation between the aforementioned constructs and their respective dimensions, without considering a causal relationship ((Hernández et al., 2014, p.81; Bernal, 2016, p. 147 It is of a non-experimental design, since an intentional handling of the predictor variable (OC) is avoided to appreciate its effect on the result variable; the idea is to observe the phenomenon in its natural environment, to carry out the analysis (Hernández et al., 2014, p. 149).

In the qualitative study, the projection is to become familiar with the subject and is used to perceive the sense and meaning of social actions in the CFIQ; In a process that seeks to observe what happens, through interviews with those involved, hypotheses are not tested, in order to have initial base data for future research in greater depth.

The population and sample

At the quantitative level, the population included teachers, administration workers and students of the FQIQ, the basis for obtaining the sample unit for its study; having defined inclusion and exclusion parameters; Once the sample unit was defined, the sample size was calculated (Hernández et al., 2014, p. 178); being the size: 294 respondents, randomly selected. A questionnaire with 21 questions was used, of which 12 correspond to variable 1: OC and 9 to variable 2: competitiveness, evaluated according to the Likert scale. For information processing and correlation tests, the SPSS version 25 program was used.

In the qualitative research, the semi-structured interview was used, using an interview guide to a sample of 9 administrative workers, validated by expert judgment.

3. Results

In the quantitative study, the reliability of the Instrument was determined with the Cronbach's Alpha test, whose results reflect very acceptable indicators, above 0.7 established by Cronbach (1951, p. 311); whose results are: for OC: 0.906; for competitiveness: 0.872 and for both variables together: 0.932. Although the internal validity was performed via expert judgment, the validity of the construct (validity of the internal structure) was performed using the exploratory factor analysis (EFA), fulfilling two previous tests, for which a minimum sample of 200 observations is required. and the use of a graduated response scale (with Likert of 5 or more categories), as is the case of the present study: scale with 5 response categories and 294 observations, is a sample size for a solution to be stable and generalizable (Ferrando and Anguiano-Carrasco, 2010, p. 25).

The first test is a security and a necessary condition, called Bartlett's sphericity test, to test if the variables under analysis are related in the population; the application verified the existence of statistically significant correlations, to the extent that the expected value $p\text{-value} = 0.000$, was less than the significance 0.05, admitting that there is some relationship between the variables. Once the previous condition is fulfilled, the second test called the Kaiser-Meyer-Olkin (KMO)

sample adequacy measure is applied, which evaluates the degree of joint relationship between the variables; if the correlations are large enough (on a scale from 0 to 1), stable results will be obtained, replicable in other different samples, regardless of the size of the sample, or the number of factors (meaning dimensions) or the number of items; that is, the results will not be random. In the present investigation, the KMO test reveals satisfactory values: for the variable OC 0.929 and 0.875 for the variable competitiveness (See Table 1), above the value 0.8 accepted in the literature (Ferrando and Anguiano-Carrasco, 2010, p. 26; Lloret-Segura et al., 2014, p. 1166), which reveals that the correlation of the items and between the items is high enough to run the EFA. Its application reflects a total explained variance of the CO variable of 63.35%, which may be a high enough value to estimate that five is a sufficient number of factors, and a total explained variance of the competitiveness variable of 70.13%, which may be also a value high enough to estimate that three is a sufficient number of factors, as designed in the operationalization of variables.

Table 1. KMO and Bartlett's test of the variables OC and competitiveness

KMO and Bartlett's test		
Variable organizacional culture		
Kaiser-Meyer-Olkin		0,929
Measure of Sampling Adequacy		
Bartlett's test of Sphericity	Approx. Chi-Square	1518,157
	df	66
	Sig.	,000
Variable competitiveness		
Kaiser-Meyer-Olkin		0,875
Measure of Sampling Adequacy		
Bartlett's test of Sphericity	Approx. Chi-Square	1067,447
	df	36
	Sig.	,000

Source: SPSS Processing Result

descriptive analysis

For the descriptive analysis, Table 2 shows that about 35.4% and 57.8% of the respondents at the high and medium level, respectively, perceive OC as important.

Table 2. Frequency distribution of organizational culture levels

Level	Frequency	Percentage (%)
Low	20	6,8
Medium	170	57,8
High	104	35,4
Total	294	100%

Source: SPSS Processing Result

In the case of the components of the OC, in Table 3 it can be seen that the perception of the respondents about the importance of each dimension, register values above 50%, and their tendency towards what level is projected, will be analyzed with the variability of your data.

Table 3. Frequency distribution of organizational culture dimensions

Dimensions	Level	Frequency	Percentage (%)
Strategic direction	High	112	38,1
	Medium	150	51,0
	Low	32	10,9
	Total	294	100%
Policies, rules and regulations	High	114	38,8
	Medium	149	50,7
	Low	31	10,5
	Total	294	100%
Leadership	High	105	35,7
	Medium	151	51,4
	Low	38	12,9
	Total	294	100%
Communication	High	102	34,7
	Medium	166	56,5
	Low	26	8,8
	Total	294	100%
Relationships	High	108	36,7
	Medium	155	52,7
	Low	31	10,5
	Total	294	100%

Source: SPSS processing result

For the competitiveness construct, the data in Table 4 shows that practically 31% and 59% of the high and medium level of the respondents, respectively, perceive it as important.

Table 4. Frequency distribution of the competitiveness construct

Level	Frequency	Percentage (%)
Low	29	9,9
Medium	174	59,2
High	91	31,0
Total	294	100%

Source: SPSS Processing Result

For the descriptive analysis and estimation of the trend of the respondents' perception of the importance of the variables and dimensions, the information on the mean and deviation (data variability) detailed in Table 5 is considered.

Table 5. Descriptive statistics

Variables and dimensions	N	Mean	Deviation	Variance
Competitiveness	294	30,03	5,898	34,787
Organizational culture	294	40,59	7,374	54,372
strategic direction	294	10,37	2,107	4,438
Leadership	294	6,55	1,645	2,706
Relationships	294	6,72	1,498	2,243
Educational quality	294	13,92	2,891	8,359
Scientific production	294	9,77	2,344	5,494
Internacionalization	294	6,34	1,723	2,968

Source: SPSS Processing Result

In the case of the OC construct, the mean (40.60) was located within 58% of the personnel connected to the medium level (See Table 2); but taking into account the variability 7.4 (See Table 5) the trend is towards the high level; then this perspective allows visualizing that the perception of the respondents confers a 93% significance.

Regarding the components of the OC construct, on average 89% (medium and high level) of the respondents, visualized significant the contribution of the aforementioned components in the explanation of the OC construct, which is detailed in Table 6 (its calculations were performed using the data in Tables 3 and 5).

Table 6. Results and interpretation of the descriptive analysis of the specific hypotheses

Dimension	Interpretation of results
Strategic direction	The average is 10.4 and it is located in the Medium level, connected to 51% of the staff. Examining variability 2.1; a trend towards the High level is observed, obtaining that 89% of the respondents configure a perception of acceptance about the questions of the items of greater value (scale 5: strongly agree), thus highlighting the significant explanation of this variable. They perceive that the vision, mission and values are of the utmost importance and are understandable; requiring greater socialization for its application.
Policies, rules and regulations	The mean is 6.0 and it is located at the Medium level, connected to 50.7% of the staff. Examining Variability 2.0; a trend towards the High level is observed, obtaining that 89% of the respondents configure a perception of acceptance about the questions of the items of greater value (scale 5: strongly agree), thus highlighting the significant explanation of this variable. They perceive the importance of disseminating these regulations that guide the best performance.
Leadership	The average is 6.6 and it is located at the Medium level, connected to 51.4% of the staff. Examining variability 1.6; a trend towards the High level is observed, obtaining that 87% of the respondents configure a perception of acceptance about the questions of the items of greater value (scale 5: strongly agree), thus highlighting the significant explanation of this variable. They perceive fair treatment from managers and reveal the importance of effective leadership.
Communication	The average is 9.5 and it is located in the Medium level, connected to 56.5% of the staff. Examining Variability 2.0; there is a trend towards the High level, so that 91% of the respondents configure a perception of acceptance about the questions of the items of greater value (scale 5: strongly agree), thus highlighting the significant explanation of this variable. They perceive that communication channels are established.
Relationships	The mean is 6.7 and it is located at the Medium level, connected to 52.7% of the staff. Examining variability 1.5; there is a trend towards the High level, so that 89% of the respondents configure a perception of acceptance about the questions of the items of greater value (scale 5: strongly agree), thus highlighting the significant explanation of this variable. They perceive that there is participation in decision-making mechanisms, as is the case with the existence of the Federated Student Center and representatives on the Faculty Council.

Similarly, for the competitiveness construct, the analysis reveals that the mean (30.0) was located at 59% of the staff, connected to the medium level (See Table 4). Examining the variability 5.9 in Table 5, the trend towards the high level is appreciated; resulting in 90% of respondents perceiving it as significantly important.

In this regard, Wahyuningsih et al. (2019, p. 142-143) highlighted that previous research concluded on the importance of culture for business success; however, they stated that there is no universally accepted instrument for measuring OC; but they reveal that culture is an organizational instrument that can strengthen the mission, it describes foundational organizational values that instill and influence decision-making and business strategy. From another perspective, Hitka et al. (2015, pp. 27-28) highlighted that the culture in terms of the system of values and behavior standards is unique for each organization and represents the specific nature of its functions; and despite the difficulty due to a variety of definitions of culture, the objective of analyzing an organization is to highlight its importance in managing its elements, and possible changes in the OC, as a source of competitive advantage. In this regard, there are coincidences with what was pointed out by the aforementioned researchers, since it is risky to impose a vision that may not be accepted, since the construction of that vision must be shared, which implies and is essential that the managerial levels recognize this situation. ; It is expected that for this achievement, they must socialize those involved, promoting awareness and unity with a perspective of achieving the identification of people, so that their behavior and their manifestations are in line with the underlying functions of the university.

inferential analysis

For the inferential analysis, in the first place, using the Kolgomorov-Smirnov technique (for a sample greater than 50), the normality of the data was determined, showing with high statistical significance that both constructs OC and competitiveness, as well as the dimensions of the explanatory variable OC, all of them do not present a normal distribution; because the p-value is much lower than the level of significance required ($\text{sig} = 0.000 < 0.05$). As the data is not parametric, the hypothesis testing was done with the Spearman statistical test.

For the test of statistical hypotheses, that is, the test of the relationship of two variables, the analysis structure is followed and according to decision criteria as follows:

Hypothesis:

Ho: Null hypothesis (when p-value > 0.05) There is no correlation with significance.

H1: Alternative hypothesis (when p-value < 0.05) There is correlation with significance.

At this point, the relationship between the two variables is tested: OC and competitiveness, under the guidelines already established. The results indicated that the value obtained p-value = 0.000 is less than the level of significance (0.05), concluding that there is a correlation between both variables with high significance, with Spearman value = 0.718, the positive correlation being high and significant (Table 7).

Table 7. Correlations between organizational culture and competitiveness

		Competitiveness
organizational culture	Spearman Correlation	,718**
	Sig. (2-tailed)	,000
	N	294

Note ** Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Processing Result

The test of the specific hypotheses of the five dimensions of OC with competitiveness also follow the correlation pattern with high statistical significance (p-value = 0.000, less than significance 0.05) with Spearman correlation values above 0.50, positive and acceptable, as can be seen in Table 8. These results reflect that there is an association of the aforementioned five dimensions of OC with the competitiveness variable, with high statistical significance.

Table 8. Correlations between the five specific hypothesis and competitiveness

Specific hypothesis	Competitiveness	
1. Strategic direction	Spearman Correlation	0,603
	Sig. (2-tailed)	0,000
2. Policies, rules and regulations	Spearman Correlation	0,596
	Sig. (2-tailed)	0,000
3. Leadership	Spearman Correlation	0,593
	Sig. (2-tailed)	0,000
4. Communication	Spearman Correlation	0,621
	Sig. (2-tailed)	0,000
5. Relationships	Spearman Correlation	0,579
	Sig. (2-tailed)	0,000
	N	294

** Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Processing Result

An important aspect are the results of correlation with high statistical significance (p-value = 0.000, less than significance 0.05) between the dimensions of OC and dimensions of competitiveness (See Table 9), obtaining Spearman statistics, standing at an average of 0.50, positive and acceptable, which supports the thesis of a high degree of association between both constructs under analysis.

Table 9. Correlation between the dimensions of OC and dimensions of competitiveness

Dimensions of organizational culture	Dimensions of competitiveness								
	Educational quality			Scientific production			Internationalization		
	RHO	Sig. (2-tailed)	N	RHO	Sig. (2-tailed)	N	RHO	Sig. (2-tailed)	N
Strategic direction	,614**	0,000	294	,476**	0,000	294	,456**	0,000	294
Policies, rules and regulations	,538**	0,000	294	,518**	0,000	294	,461**	0,000	294
Leadership	,510**	0,000	294	,469**	0,000	294	,518**	0,000	294
Communication	,578**	0,000	294	,482**	0,000	294	,513**	0,000	294
Relationships	,505**	0,000	294	,443**	0,000	294	,522**	0,000	294

** Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS Processing Result

On the other hand, the regression analysis and analysis of variance (ANOVA) confirm the degree of relationship between both variables: OC and competitiveness and the dimensions of OC with competitiveness, showing that it is possible to build a linear regression model with the two variables under analysis. Thus, the determination coefficient value (R2) of 0.522 was obtained, which allowed concluding that the OC variable is capable of explaining 52.2% of the variability of the competitiveness variable (See Table 10), it is understood that other different variables also contribute to this explanation.

Table 10. Summary of the correlation model

Resumen del modelo				
Model	R	R Square	R adjusted square	Standard error of the estimate
1	,722 ^a	,522	,520	4,086

a. Predictors: (Constant), Organizational culture

In the analysis of variance (ANOVA) it is concluded that it is possible to build a linear regression model with the two referred variables, when obtaining an F value equal to 318.6, which statistically revealed a high significance, given that the value obtained p-value = 0.000 is less than the level of significance (0.05) (See Table 11).

Table 11. Analysis of variance ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5318,304	1	5318,304	318,591	,000 ^b
	Residue	4874,420	292	16,693		
	Total	10192,724	293			

a. Variable dependent: Competitiveness

b. Predictors: (Constant), Organizational culture

To estimate the regression equation, the results of the high statistical significance test for the estimated coefficient of the OC variable revealed that the value $t = 17.849$, corresponds to a p-value = 0.000 much lower than the level of significance required (0.05), and consequently it was possible to highlight that the average change in the competitiveness variable for each unit of change in the valuation of the OC variable is equal to 0.578; In this way, the mathematical model to explain the linear relationship between the aforementioned variables can be expressed as follows (See Table 12): $\text{Competitiveness} = 6.577 + 0.578 (\text{CO})$.

Table 12. Linear regression model

Coefficients						
Modelo		No-standardized Coefficients		standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6,577	1,335		4,925	,000
	organizational Culture	,578	,032	,722	17,849	,000

a. Variable dependent: Competitiveness

Similar results were obtained when performing the ANOVA analysis between each of the dimensions of the OC variable and the competitiveness variable. Therefore, an increase in the improvement of the measures of the inducers (OC components) will impact in the same direction; These results guarantee the proposal of strategies to improve the levels of competitiveness through the improvement and strengthening of the components of the OC variable. What configures the above is that OC is not the only variable that influences or has a high degree of association with competitiveness, in the literature it has been shown that there are other variables such as innovation, information technologies, employee behavior, among other factors, may have

greater or lesser influence, depending on the nature of the phenomenon under study. Indeed, Azeem et al. (2021, p. 1) in their applied empirical research in Pakistani companies revealed that OC, knowledge sharing, organizational innovation positively affects competitive advantage, highlighting that OC is essential for business success.

Comparison of inferential results with other similar studies.

Llanos (2018) related OC with five dimensions (institutional philosophy; rules and regulations; leadership; communication and relationships) with the educational quality variable; with a questionnaire that registered a Cronbach's Alpha reliability (0.993), and high statistical significance between the aforementioned constructs. Complementing the above, Köse et al. (2019) evaluated the relationships between OC and academic performance in four Turkish HEIs by applying the OCAI instrument, finding good internal reliability (Cronbach's alpha: 0.70) and a high significance between the three types of culture analyzed with academic performance when obtaining a $p = 0.001$ and Pearson above 0.74; highlighting that his original contribution made to the literature by said research is the performance review that included the parameters: number of publications and citations.

Likewise, Ben et al. (2019) studying the impact of transformational leadership on organizational performance in a manufacturing company, using a measurement instrument that had a Cronbach's alpha reliability (above 0.7), found a correlation between the aforementioned variables with high statistical significance (p -value less than significance 0.05) and a statistic 0.858. They justified their work under the premise that companies focus on promoting innovation for survival and strive to improve to compete and stay in the market; but that organizations often fail to achieve a viable competitive advantage due to their limited understanding of the relationships between these deliberate variables, results supported by studies by other researchers.

As expressed by Liu et al. (2021, pp. 740 and 746), various studies have examined the relationships between knowledge-friendly OC (KFOC) and performance, having found various and some contradictory results. In order to clarify such a situation, in their study they analyzed such relationships using the meta-analysis technique. The importance and novelty of the aforementioned work as a contribution to the literature revealed the complex relationships between KFOC and organizational performance, confirming that KFOC is positively related to organizational performance, which means competitiveness. From the position of Lee et al. (2015), investigated the efforts that companies make to maintain interpersonal relationships and whether they have a positive influence on their performance, for which they collected data from 245 small and Small and Mid-size enterprises (SMEs) in a major industrial complex in China. They examined the interpersonal relationships of the company in two parts: i) internal relationship - an organization's commitment to the well-being of its employees (OCE) and ii) external relationship - managerial links with the top executives of the other firms (businesses guanxi). Using SPSS, the results were as follows: OCE and guanxi have a positive relationship with the financial and strategic performance of a company. This indicated that while maintaining good interpersonal relationships would improve the performance of a Chinese SME, its importance and direction of influence varies depending on the strategy being pursued. These results suggest that business enterprises need to know the roles and elaborated meanings of interpersonal relationships in China.

As expressed by Wills-Espinosa et al. (2017) obtained some findings in their research as part of a longitudinal study on the relationship between satisfaction with internal communication and organizational commitment in an Ecuadorian HEI. They identified that between the variables communication and organizational identification there is a correlation with high statistical significance, with a Pearson statistic ($r = 0.17$) positive and weak; while the identification and organizational commitment variables have a high level of significance, with a positive and

moderate Pearson coefficient ($r = 0.69$). The employees feel that there is a disconnection in the communication on the day to day by the lower hierarchical levels, showing dissatisfaction with the disorganization of the meetings, the lack of information on the management of the HEI and the time lapse for receive information that generates rumors in informal communication. The important thing is that they revealed that their study was supported by other research.

As stated by various researchers such as Silva (2012), Forum of the Social Councils of public universities in Andalusia, Spain (2009), Blagireva (2015), Dimitrova et al. (2017), Stasyk (2018), Lòpez-leyva (2020), agree on an effort to conceptualize the competitiveness of HEIs and their method of measurement, considering among them the factors that are incorporated into the university rankings (such as are the cases of: ARWA, THE and QS).

Synthesizing, in relation to the aforementioned studies, it is concluded that they are contributions to understand the results obtained in this work, by verifying the significance of the degree of association between the two OC constructs and competitiveness in HEIs. It is also evident that there are other parameters in addition to OC that influence the performance or competitiveness of organizations. In addition, it should be noted that in the current circumstances the dimensions incorporated in the competitiveness construct are parameters that increasingly become relevant in the ranking of universities as a mechanism to make the level of educational quality and organizational performance visible; For this reason, this study contributes to the dissemination of a tendency to study or define more precisely: the concept of university competitiveness.

Discussion of the results of qualitative research.

From the results it was possible to appreciate that the manifestations of the respondents, through the components that form what Schein and other researchers call the artifacts, coincide with what is established in the dimensions of the OC. In the first place, the interviewees expressed their satisfaction with the functions they perform, which is a sign of identification with the institution despite the low remuneration levels they register; highlighting the importance that managers have leadership, because in his opinion this attribute improves communication, relationships between people, compliance with regulations with value. They estimated that not having logos and slogans does not contribute to consolidate an image and differentiation with the other faculties; They also indicated that, although the UNMSM Hymn exists, very few sing it at ceremonies, in their opinion due to a certain indifference that the teaching and administrative staff show, due to some discontent they feel inside. This finding is a sign that limits the achievement of a robust OC. These results on the behavior and its manifestations as a result of their experiences of years in their relationships with teachers and students and from day to day, are contributing to the formulation of a strategy for the change and strengthening of the OC in the Faculty of Chemistry and Engineering Chemistry (FQIQ) and therefore from the same university.

4. Conclusions

The descriptive analysis revealed that according to the statistical trend (medium and high level) 93% of the respondents perceive the OC construct as significant in the explanation of the competitiveness construct. Similarly, 89% of the respondents perceive the importance of the contribution of the OC dimensions in the understanding of the competitiveness construct.

In the contrast of the general hypothesis, it was proved with high statistical significance (p-value less than significance 0.05) that between the variables OC and competitiveness there is a high degree of association, with a Spearman statistic 0.718, being positive high and significant. This finding reveals that any improvement action in the components of the OC, will allow improvements in institutional performance, to the extent that it is reflected in an integrated strategy system.

Likewise, specific hypothesis 1 was tested, showing with high statistical significance (p-value less than significance 0.05) that there is an association between the variables strategic direction and competitiveness, with a Spearman statistic of 0.613, being moderately positive, but significant. The result validates the need for the university to socialize its institutional strategic plan (PEI) more widely, in the perspective that the San Marcos community aligns itself with its institutional vision and mission.

Specific hypothesis 2 was also tested, showing with high statistical significance (p-value less than significance 0.05) that there is an association between the political variables, norms and regulations and the competitiveness variable, with a Spearman statistic of 0.596, being moderately positive, but significant. It is proven that the establishment of policies and norms contributes to an adequate behavior of the members of the university in the best performance of their actions.

The analysis tested the specific hypothesis 3, showing with high statistical significance (p-value less than significance 0.05) that there is a relationship between the leadership and competitiveness variables, with a Spearman statistic of 0.593, being moderately positive, but significant. This important finding indicates that the strengthening of leadership at all levels of the organization is extremely significant to promote organizational changes and consolidate the OC, and therefore the improvement of university competitiveness.

Specific hypothesis 4 was proven, showing with high significance (p-value less than significance 0.05) the existence of a correlation between the communication and competitiveness variables, with a Spearman statistic of 0.621, being moderately positive, but significant. Having a good communication system contributes to a better understanding of the management and achievements carried out by the management.

Likewise, specific hypothesis 5 was tested, showing with high significance (p-value less than significance 0.05) that there is a correlation between the variables interpersonal relationships and competitiveness, with a Spearman statistic of 0.579, being moderately positive, but significant. This finding reveals that, if there are good strategies to enhance people's attitudes and behavior, it contributes to alignment with the university mission.

High sustainability is obtained in the statistical results found, when the specific hypothesis between the five dimensions of OC and the three dimensions of competitiveness is tested, evidencing with high significance (p-value less than significance 0.05) the existence of correlation between all of them; with Spearman statistics, although moderate, they are positive and significant.

The analysis of variance (ANOVA) confirmed with high statistical significance that it is possible to build a linear regression model with the general variables OC and competitiveness, which configures the high statistical relationship and therefore the high significance of the association between the aforementioned variables. In addition, with high statistical significance, the five dimensions that are part of the OC also show a linear regression with the competitiveness variable. Of great importance is the fact that the OC variable is capable of explaining more than 52.2% of the variability of the competitiveness variable, which reflects the important impact that OC shows in the results of organizational effectiveness or competitiveness.

The results of the preliminary exploratory qualitative research also confirmed the manifestations of the administrative workers of what they think and feel through their perception of the Artifacts as an explanation of the Institutional Image dimension, which is part of the OC variable.

The proposal of a referential framework of the model that relates the aforementioned variables, has allowed to obtain findings in the present case study with a mixed approach, which represents a contribution to the studies related to analyzing the degree of association between the OC constructs and competitiveness in a faculty of a university in Lima, Peru. Likewise, it constitutes a contribution to knowledge in this field of research, given the scarcity of studies at the national and international level with the proposed reference framework. This contribution is based on previous studies located in the literature, which has served to guide this work, resulting in a readjusted model, whose reliability and validation have been scientifically demonstrated through the results obtained.

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