



# Review of collaborative networks in the Covid-19 era

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## ABSTRACT

Knowledge networks and organizational collaboration reflect a culture of success, transformational leadership and a climate of relationships around which relationships of trust, support and innovation are generated. These are bi-directional and horizontal organizations with equity and solidarity. The objective of the present study is to establish the correlations between the factors, a non-experimental, transversal and exploratory study was carried out with a selection of 300 administrative, students and teachers from a public university in central Mexico. From a structural model, the results show that there is a dependence relationship between organizational climate and collaboration. Based on these findings, research lines related to trust as a determinant of knowledge networks and organizational collaboration.

**Keywords:** *Work Culture; Institutionalism; Leadership; Knowledge Network; Collaboration*

## 1. INTRODUCTION

The objective of this work was to specify a model for the study of collaboration networks by establishing the reliability and validity of an instrument that measures the organizational process in a sample of administrators, teachers and students of a Higher Education Institution of the State of Mexico affiliated with the National Association of Faculties and Schools of Accounting and Administration (ANFECA).

In the context of educational policies focused on the link between the local market and academic *curricula*, social entrepreneurship through academic networks supposes the formation of a gender identity or *habitus* that consists in the professional formation of an ethics of the collaboration (Cruz et al., 2016). It is an ethic that begins with the establishment of empathy, trust, commitment, innovation, satisfaction and happiness (García et al., 2016).

In this way, collaborative networks, derived from educational institutionalism consisting of the evaluation, accreditation and certification of the quality of processes and products, show the differences between genders based on their capacities, skills and knowledge (Hernández & Valencia, 2016).

Therefore, the formation of collaborative networks implies the training or training of groups around specific objectives, tasks and goals, but the formation of collaborative networks around professional identity implies the establishment of a system of communication and motivation of the leader towards talents or among employees (Acar and Acar, 2014).

## 1.1. COMPLEX ORGANIZATIONAL STRUCTURES

Las collaborative networks are formed around labor climate such as relationships, task, the props and innovation in order to undertake or specify knowledge that will result in innovation according to the degree of complexity concerning the self-regulation, dissipation, adaptability and dynamism (see Table 1).

**Table 1. Structures and climates in complex organizations**

	<b>Rules</b>	<b>Support</b>	<b>Innovation</b>	<b>Goals</b>
Self-regulation	Self-regulating organizations establish norms in order to achieve a balance between external demands and the availability of internal resources.	Self-regulating organizations establish forms of cooperation and solidarity in the face of a significant difference between opportunities and capabilities.	Self-regulating organizations produce knowledge and innovations in order to reestablish a balance between risks and objectives, uncertainty and goals.	Self-regulating organizations determine objectives and goals based on the balance of their expectations and needs.
Dissipation	Emerging organizations are guided by restructuring principles based on the availability of resources rather than market demands.	Emerging organizations interact with knowledge-producing nodes to generate opportunity structures in situations of unemployment.	Emerging organizations reflect the uncertainty of economic crises and their innovations are an effective response to uncertainty and entrepreneurial risks.	Emerging organizations determine objectives and goals as market demands are contingent.
Adaptation	Adaptive organizations follow unpredictable principles from which to build new opportunities and capabilities.	Adaptive organizations underlie the uncertainty of the markets in order to structure new collective knowledge.	Adaptive organizations generate the information conducive to new knowledge and innovations to face the instability of the markets.	Adaptive organizations establish objectives and goals based on the risks involved in entrepreneurship and innovation.
Dynamic	Dynamic organizations are unstable in the development of their quality processes.	Dynamic organizations through cooperation and solidarity establish the quality of their processes and products.	Dynamic organizations are flexible in the face of market instability and state demands.	Dynamic organizations set goals and targets based on economic, political, and social changes.
Complexity	Complex organizations generate knowledge networks from which they establish imbalances and stability.	Complex organizations establish strategic alliances in order to produce value in terms of opportunities and capabilities.	Complex organizations generate innovations for local positioning and transformation.	Complex organizations establish their objectives and goals based on the contingencies of the environment.

*Source: Own elaboration, as adopted by Carreón (2016)*

In essence, complex organizations are collaborative. That is, its relationship with the demands of its environment orients it towards self-regulation or the balance of its processes by optimizing its resources or innovating its capabilities depending on the availability of opportunities. This is the case of organizations with a climate of collaborative relationships focused on the rules (Mendoza et al., 2016).

For their part, dissipative organizations generate collaborative networks to amplify their options for solidarity or support climates based on their future possibilities. In the same sense, the theory of prospective decisions warns that dissipative organizations are those that orient their collaborative networks towards scenarios that pose more risks than benefits if the latter are minimal (Omotayo & Adenike, 2013).

In contrast, forward-looking decision theory indicates that adaptive organizations are those that orient their collaborative networks towards unlikely profit scenarios with respect to minimal risks or threats (Escobar, 2014).

This is how dynamic organizations, following the approaches of the theory of prospective decisions, are creators of innovations and diffusions according to work climates. In this sense, the production of knowledge is the result of collaborative climate oriented by intentions to maximize benefits and reduce imponderables (Anicijevic, 2013).

Complex organizations develop collaborative networks for the optimization of resources and process innovation, since their relationship with their environment forces them to develop sustainability protocols focused on austerity, anticipation, altruism, effectiveness, deliberation and savings. of resources depending on the scarcity of opportunities or the increase in external demands (see table 2).

**Table 2.** Temporary arrangements of complex organizations

	<b>Austerity</b>	<b>Anticipation</b>	<b>Altruism</b>	<b>Effectiveness</b>	<b>Deliberation</b>	<b>Saving</b>
Self-regulation	√	√		√	√	√
Dissipation				√	√	
Adaptation	√		√	√	√	√
Dynamic		√		√	√	
Complexity	√	√	√	√	√	√

*Source: Own elaboration, as adopted by Carreón (2016)*

In other words, complex organizations with collaborative networks are in essence sustainable since they develop an identity of propensity for the future, or an identity of optimization of resources rather than of process innovation (Quintero et al., 2016).

The orientation towards sustainability or the affinity towards the conservation of resources distinguishes complex organizations with collaborative networks focused on the optimization of resources (Sales et al., 2016). The same propensity for a shared future not only implies that organizations assume resources as common goods, but also generates an isomorphic process in which they are circumscribed to guarantee their preservation through collaboration (Robles et a., 2016).

In that tenor of orientation towards sustainability, organizations are structured in networks, neurons, graphs, nodes or arcs to establish cooperative, solidarity or collaborative relationships depending on the contingencies of the environment (Vázquez et al., 2016).

More precisely, organizations are built based on values and norms that will determine the processing of information and based on this they will make decisions and actions in relation to their increasingly scarce environment in terms of resources and opportunities. Therefore,

organizations with a sustainability orientation must optimize their resources, generating their own opportunities for propensity for the common future (Saansongu & Ngutor, 2012).

## 1.2. COLLABORATIVE ACADEMIC NETWORKS

In the field of Higher Education Institutions (HEIs), collaborative networks have emerged from cognitive psychology, mainly approached from the theory of technology adoption, self-efficacy and risk in general, and computational self-efficacy and risk informative in particular (Dugloborskyte & Petraite, 2017).

In each of these three approaches, collaborative networks are the product of individual teaching and learning skills. Even the theoretical perspectives allude to self-learning, avoiding the relations of power and influence raised by social psychology (Storga et al., 2013).

In this way, in the face of individual skills, experiments emerge that will reliably demonstrate the social influence of collaborative groups in the retention, use and performance of individuals assigned to collaborative groups within the framework of work climates focused on the relationships of tasks, innovations and supports. (Huilan et al., 2017).

Simpson (2008) reviewed the literature on collaborative distance learning to note a prevalence of group influence over learning in its directed or self-taught modalities. The difference lies in the fact that the collaborative groups strengthened their retention capacity more than those individuals formed from the motivation of their abilities or the self-motivation of their abilities. That is, while the transfer of knowledge was carried out based on the use and processing of information that the teacher had to correct and adjust to a learning line, in collaborative groups empathic and synergistic relationships were established that potentiated their capacities and abilities. retention, learning, achievement and performance.

However, both learning routes, that of individual competencies regarding social influence, oscillate between a tacit knowledge and an implicit knowledge deposited in the talents and leaders that the organization must retain in order not to lose that intellectual capital and also make concessions to these carriers of knowledge so that they can transfer their skills or strategies to future generations of educators and students (García et al., 2017) .

This is how knowledge management arises to protect the accumulation of information that only talents and leaders can capitalize on in favor of the organization. In this sense, Information and Communication Technologies (ICT), electronic devices and digital networks become relevant in the construction of intangible assets and competitive advantages for organizations dedicated to the creation of knowledge, mainly those that produce it, such as knowledge. case of HEIs in general and public universities in particular (Wu et al., 2015).

### 1.3. KNOWLEDGE NETWORK MANAGEMENT

Management knowledge in a computational sense, involves coding implicit knowledge to tacit knowledge as would be the case of decisions and actions based on iteration of opportunities and challenges (Abar et al., 2010)

Regarding knowledge management, the models revolve around individual capacities, competencies and abilities, consequently, most of them in the implicit order with respect to the more tacit and consequently more empathic, communicative and tacit models. as is the case of the synergic model of knowledge networks.

In this way, between the synergistic model of social influence mediated by some technology and the model of competencies and vertical transfer , g rosso mode , the intermediate model of knowledge management or conversion and protection of the information product of experience and individual skills It includes three phases: 1) knowledge capture processing through the conceptual mapping of information from knowledge agents and receiving agents; 2) construction and administration of user profiles, skills and knowledge networks; 3) generation of knowledge structures for the group knowledge repository (García, 2013) .

However, in this approach to knowledge management, unidirectional and therefore unilateral communication and motivation prevail. That is, knowledge is managed, produced and transferred in a vertical sense without considering the needs of the users or their possibilities of interaction of utility expectations.

Therefore, it is necessary to delve into a network of academic knowledge with a collaborative sense, which can be observed in its levels of relationships, innovations, supports and goals according to the contingencies of its environment, as is the case of a system of practices and social service implemented between the public university and branches of an automotive multinational in central Mexico.

In the context of the strategic alliance between the IES and the multinational, the systems of practices and social service emerges as a scenario for the study of collaborative networks derived from the management, production and transfer of knowledge, but because such an alliance is It is oriented towards the student's labor insertion, therefore, it will be necessary to observe its dimensions of supports, innovations, goals and relationships.

Will the organizational dimensions oriented to the complexity of its collaborative and sustainable processes used in the consulted literature adjust to the empirical observations to be made in a case study with students, administrators and teachers of a public university in central Mexico?

Organizations dedicated to the creation of knowledge through collaborative networks develop and consolidate dimensions of complexity related to self-regulation, dissipation, adaptability and dynamism as a hallmark of the optimization of resources and the innovation of their processes. In this sense, it will be possible to observe such dimensions in a case study with a HEI in central Mexico.

However, the theories and empirical findings reviewed in the literature warn that organizations develop complex collaborative networks in order to self-regulate, dissipate, adapt and become more dynamic in the face of the scarcity of resources, the specificities of the context and the particularities of the sample. of study warn that it is an unprecedented phenomenon and therefore explorable in terms of its organizational structures.

## 2. METHOD

A non-experimental, cross-sectional and exploratory study was carried out. A non-probabilistic selection was made of 300 administrators, teachers and students from a public university, affiliated with ANFECA in area five.

Scale was used Collaboration Organizacional Carreon (2016) which includes four dimensions concerning the relations environment, supports, innovations and goals. Each item is answered with one of five options that go from "not at all agree" to strongly agree ".

The Delphi technique was used to homogenize the words included in the statements of the instrument. The confidentiality of the results was guaranteed in writing and it was reported that these would neither negatively nor positively affect their employment-administrative status. The information was processed in the Statistical Package for Social Sciences (SPSS). Mean, standard deviation, alpha, sphericity, adequacy, factorial weights, goodness of fit and residuals were estimated.

## 3. RESULTS

The table 3 shows the statistical properties of the instrument which established four dimensions of collaboration organized ational, namely the relations environment, supports, innovations and targets alpha coefficients Cronbach above the bare minimum (0.700) to consider it as a measurement consistent.

**Table 3.** Descriptive of the instrument

Item	M	D	S	C	TO	FI	F2	F3	F4
Subscale of relations (specifications before generalities)					0.781				
r1 Educational assessment generates indexed articles	3.240	1.250	1.0200	1.320	0.743	0.632			
r2 The production of innovations is in accordance with the educational quality	3.290	1.270	1.390	1.350	0.793	0.694			
r3 Thesis advice derives from the merit contest	3.000	1.470	1.400	1.380	0.714	0.661			
r4 Research projects arise from credentialism	4.280	1.850	1.440	1.540	0.756	0.632			
Support subscale (collaborations in the face of imponderables)					0.793				
r5 Mass education meant the weakening of trade unionism	3.050	1.040	1.050	1.470	0.742		0.631		
r6 Teacher individualism obeys educational policies	3.810	1.370	1.280	1.390	0.746		0.635		
r7 Educational neoliberalism generates collegiate works	3.210	1.210	1.380	1.27	0.784		0.563		

Item	M	D	S	C	TO	FI	F2	F3	F4
r8 Multidisciplinary research is a product of meritocracy Innovations subscale (proposals for contingencies)	3.560	2.310	1.290	1.070	0.795		0.594		
					0.785				
r9 The teaching proposals underlie the educational crisis	4.210	1.700	1.330	1.210	0.790			0.671	
r10 The educational dropout generated the scholarship system	4.240	1.480	1.200	1.240	0.712			0.493	
r11 Constructionism is the result of educational lag	3.910	1.310	1.250	1.360	0.774			0.614	
r12 Educacional policies fostered credentialism Goals subscale (achievements against risks)	3.260	1.830	1.370	1.320	0.732			0.632	
					0.758				
r13 The budget cut generated absenteeism	4.340	1.830	1.090	1.300	0.795				0.381
r14 The awards are derived from mass education	4.650	1.570	1.150	1.260	0.782				0.532
r15 Multidisciplinary studies indicate technoscientific politics	4.810	1.460	1.130	1.320	0.784				0.635
r16 Educational financing is achieved with the management	4.300	1.240	1.360	1.490	0.793				0.512

Source: Elaborated with data study. M = Mean, D = Standard deviation, S = Bias, C = Kurtosis, A = Alpha removing the value of the item. Extraction method: Main components. Sphericity and adequacy [ $\chi^2 = 3.251$  (23gl)  $p = 0.000$ ; KMO = 0.681]. F1 = Climate of Relationships (45% of the total variance explained), F2 = Climate of Supports (15% of the total variance explained), F3 = Climate of Innovations (8% of the total variance explained), F3 = Climate of goals (3% of the total variance explained). All items include the alpha value removing their estimate and include five response options: 0 = "not at all agree" to 5 = "Strongly agree".

Once the four factors that explained 71% of the total variance explained were established, the relationships between the factors were estimated in order to establish the possible relationships of the factorial structure with respect to other variables not specified or estimated in the model.

**Table 4.** Relations between the factors and the construct

			Estimate	CR	P
Relations	<---	Collaboration	0.500		
Supports	<---	Collaboration	-0.100	,586	,837
Innovations	<---	Collaboration	-0.170	2,679	,911
Goals	<---	Collaboration	-0.330	,667	-1.341

Source: Own elaboration.

Once the relationships between the factors had been established, the structural model was estimated in which the adjustment and residual parameters [ $\chi^2 = 3.432$  (2gl)  $p = 0.180$ ; GFI = 0.950; RMS EA = 0.001; Bootsrap = 0.0000] suggest the acceptance of the null hypothesis regarding the fit of the theoretical explanations with respect to the empirical observations made in the case study of the public university (see Fig. 1).



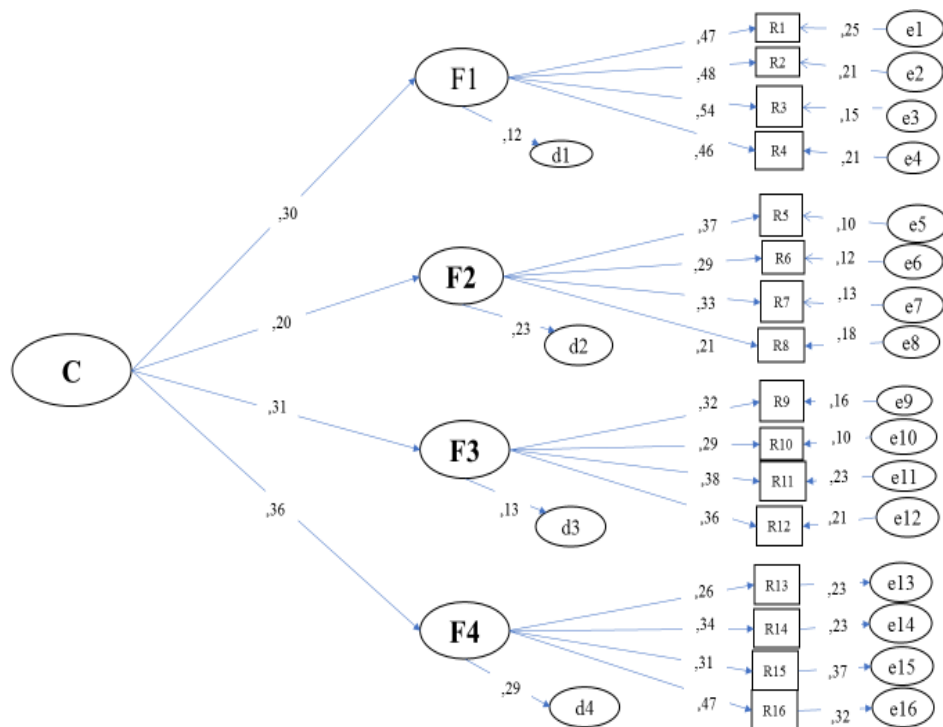


Fig. 1. Structural equation modelling

Source: Elaborated with data study. Extraction method: Main components. Sphericity and adequacy [ $\chi^2 = 3.251$  (23gl)  $p = 0.000$ ; KMO = 0.681]. F1 = Climate of Relationships (45% of the total variance explained), F2 = Climate of Supports (15% of the total variance explained), F3 = Climate of Innovations (8% of the total variance explained), F3 = Climate of goals (3% of the total variance explained).

#### 4. DISCUSSION

The contribution of this work to the state of the question lies in the specification of a model for the study of complex organizations with collaborative networks oriented towards sustainability, but the type of non-experimental study, the type of non-probabilistic sampling and the type of Exploratory factor analysis limited the findings to the study sample.

In relation to the studies of collaborative networks, which highlight isomorphism and propensity for the future, the present work has shown that four dimensions prevail relative to collaborative networks of relationships, supports, innovations and goals, but the percentage of the total variance explained supposes the inclusion of other factors that the literature identifies as a climate of tasks and trust networks.

In other words, collaborative networks distinguish complex organizations in the face of contingencies in their environment, but it is the norms and values that stand out as indicators of the organizations dedicated to the production of knowledge and the formation of intellectual capital in order to create intangible value in its processes.

In this way, the present work has evidenced the formation of collaborative networks from the climate of relationships to the climate of goals, which suggests that: 1) in complex



organizations focused on self-regulation, collaborative networks build objectives, tasks and goals with based on the balance of external demands and its internal resources; 2) in sustainable organizations, collaborative networks act as dissipators of knowledge to increase the formation of intellectual capital; 3) in knowledge-producing organizations, adaptability is an instance that will generate more knowledge in order to conserve the organization itself and its resources; 4) Organizations that optimize their resources form collaborative networks to activate a dynamic of exchanges and transactions with their contingent environment.

Therefore, it is necessary to carry out the contrast of the specified model in contexts and samples similar to the HEI under study, as well as the inclusion of a fifth factor to increase the percentage of explained variance and orient the model towards the formation of dedicated intellectual capital. to the optimization of resources and the innovation of processes.

In this way, the inclusion of the climate of empathic or trust relationships in the model will allow observing its link with the formation of academic and professional networks in a system of professional practices within the framework of strategic alliances between HEIs and multinationals.

In other words, the construction of an ethics of preservation and collaboration or a climate of empathic and trusting relationships between students, teachers and administrators supposes the beginning of a selective information process that, when decoded, will allow to protect the implicit knowledge in some technology. in order to enhance the capacities, competencies and abilities of future users in the face of increasingly risky, contingent and threatening scenarios.

This is so because the transfer of implicit knowledge in tacit knowledge is gestated from the work environment focused on empathy and trust rather than on competition. Therefore, a knowledge management model implies the inclusion and measurement of the level of trust and empathy of an organization, as well as its competencies based on the demands of the environment and the opportunities of the context.

Such a model would include: 1) knowledge management based on a diagnosis of the level of empathy and trust; 2) knowledge production based on common objectives, tasks and goals between HEIs and multinationals; 3) transfer of knowledge through the system of practices and social service, as well as the academic, technological and professional training of intangible assets such as intellectual capital.

## **5. CONCLUSION**

The objective of this work has been to specify a model for the study of complex organizations with collaborative networks that optimize resources and innovate processes in the face of contingencies in their environment, but the type of study, sample and analysis limits the model to study sample, although it suggests its contrast in other settings. It is a model from which it will be possible to form collaborative groups based on the construction of an identity or propensity for a shared future.

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