DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

VIRTUAL LEADERSHIP COMPETENCIES IN A MEXICAN UNIVERSITY (UACJ). A QUANTITATIVE CASE STUDY[1]

Competencias de liderazgo virtual en una universidad mexicana (UACJ). Un caso de estudio cuantitativo

Recibido: 9 de noviembre de 2023
Aceptado: 6 de diciembre de 2023

1 - Néstor Daniel Varela Medina. Grado académico: Doctor en Ciencias de la Administración. Adscripción: Universidad Autónoma de Ciudad Juárez. Correo electrónico: nestor.varela@uacj.mx. ORCID ID: https://orcid.org/0000-0003-1240-5534

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

ABSTRACT

This article examines virtual leadership competencies in the higher education context and its key aspects that impact virtual environments in Mexico. In this sense, one of the major contexts that has dramatically changed is higher education; however, it is worth highlighting that online leadership in universities is still scarce. This work is based on a quantitative method with a descriptive and correlational approach. For this purpose, the E-Competences Model questionnaire was applied to university professors to evaluate their virtual leadership factors and their efficiency in virtual education environment. Findings revealed that moderated correlations have been found in their competences such as e-communications and e-change with e-social, exposing the barely enough labor of leaders, fostering social interaction, as well as e-team with e-technology, showing a regular basis training in using ICT's. Conclusions intend to propose new strategies for leadership capabilities assessment and its effectiveness on virtual education environments.

Keywords*: Virtual leadership; Higher education; SEC model.*

RESUMEN

Este artículo examina las competencias de liderazgo virtual en el contexto de la educación superior y sus aspectos clave que impactan los ambientes virtuales en México. Uno de los contextos que más dramáticamente ha cambiado es el de la educación superior; sin embargo, sobresale que el liderazgo virtual en las universidades aún es escaso. Este trabajo utiliza un método cuantitativo de aproximación descriptiva y correlacional. Para ello, el cuestionario del modelo de E-Competencias fue aplicado a profesores para medir factores de liderazgo virtual y su eficiencia en el ambiente virtual educativo. Los resultados revelan que fueron encontradas correlaciones moderadas en competencias como e-cambio y e-social, exponiendo la casi insuficiente labor de los líderes al fomentar interacción social; así como también en e-equipo con e-tecnología, demostrando entrenamiento continuo en el uso de las TICs. Las conclusiones proponen nuevas estrategias para adquirir capacidades de liderazgo, efectivas para ambientes de educación virtual.

Palabras clave: *Liderazgo virtual; Educación superior; Modelo SEC.*

Código JEL: M12, M14, M54, L31.

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Introduction

With the advent of virtual technology in recent years, organizations around the world, have deployed the use of virtual communication means, taking advantages of these information technologies to collaborate as work teams, in real time, even though these workers are in different geographic location, they co-work in different projects simultaneously, based on virtual communications technologies.

Due to the rise of these technological advances, organizational leaders are facing the challenge of leading their work teams in this environment. They choose to leave the traditional way of managing, changing to remote management. In recent years, research has significantly increased about virtual leadership and leadership theories.

In this sense, one of the major contexts that has dramatically changed is higher education, however, it is worth pointing out that online leadership in universities is still scarce and is being examined. Performance of leaders in universities should be adaptable; it is essential to know and understand background evaluations, instruction, legal subjects, employee's issues, existing literature, and skills development (Peart, 2014).

Nevertheless, about massive research studies around the subject of virtual leadership, there are not overall or broadly accepted theories of this kind of leadership that could be suitable, improved or adapted, especially in universities. Furthermore, there are singular aspects associated to higher education's needs to contribute to a successful leader's development. There is a significant demand for faculty and executives to be acquainted with virtual learning processes. In that sense, it would be responsibility of education leaders to be affianced in redefining educational approaches by executing methods and better practices, so they can be a key factor in student performance improvement, in the virtual setting's education (Orcutt & Dringus, 2017). Furthermore, those mentioned instructors and administrators are continuously focused on refining educational strategies, by arranging performs that are effective in creating better learning processes, as well as student results in the online setting (Caillier, 2014; Ekmekci, 2013).

Previous studies have reported that education leaders are not considered well prepared to provide courses outlines and directions through information technologies, and many of them are struggling with collaboration platforms and model structures, training teachers to simplify virtual learning processes, virtual communications, and managing of the remote distance, adding relationships of education employees (Barbour et al., 2020; Beauchamp et al., 2021; NAESP, 2020; Pollack, 2020; Varela & Fedynich, 2020).

1. Literature review

1. 1.Virtual Leadership in Higher Education

Leadership growth is a key component of the advanced education context (Caillier, 2014). Because the expansion and scholar's enrollment in virtual classes remains to raise, it is imperious for higher education organizations to provide support to faculty and administrators by favorable means that satisfy their needs and keep the creation of professional training tailored to the requirements of employees, with the objective of refining the educational leader's efficiency (Williams et al., 2014).

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Recent Covid-19 outbreak boosted individuals to change their interaction means from face to face to communication technologies used in educational settings. It is evident, at in-situ teaching, how teachers conduct every day where they have straight interactions with students, they can take full advantage of the richness in body language, non-verbal cues, and modulation voice, to make students learn in accordance with all didactic materials.

In the age of pandemic outbreak nowadays, teachers are struggling in using those elements in a clear and straight way, because the entire fundamentals in education should shift to virtual platforms. Consequently, teachers should pace down their explanations with the purpose of reaching eloquent teaching and addressing the learning process, intended so students can comprehend the topics explained at virtual lessons (Bao, 2020).

Therefore, pandemic has exposed that it is necessary for all education leaders to possess and have plenty acquaintance of the required competencies to conduct themselves and individuals in virtual context. Nevertheless, to advance in virtual leadership, they also must have accurate knowledge of virtual skills and, in contrast from traditional face to face skills, so that they can be more effectively prepared and support all education teachers.

Advanced education leadership programs should be used for nurturing today's education leaders to successfully accomplish their tasks, particularly individuals that assist and encourage their most susceptible students. Special approach must be addressed to convey education leader's training towards virtual education environments, both for individuals who are leading in virtual environments and those who may lead in face-to-face mode, as well as the ones running additional virtual programs or executing remote instructions.

Francisco and Nuqui (2020), Harris and Jones (2020) and Pollack (2020) demonstrated evidence that educational leadership training programs should be slanted bearing in mind those challenges individuals are managing nowadays, and extensive research is necessary to address the leadership abilities suitable to the current and post-pandemic scenarios.

Due to the above, it is essential that today's virtual leaders develop those necessary competencies that allow them to lead in the appropriate way, so that educational institutions achieve the proposed objectives, which is the new reality that develop contexts in education demands.

1.2. E-Leadership Competencies

Competencies in leadership are a set of abilities that significantly contribute to the capability to perform some tasks effectively and efficiently; key competencies are needed to be addressed, to shape strategies for online education improvement, if this research is not generic, it creates an important contribution to the online leaders to gain a better comprehension of the required competencies for online headship.

It is suggested that extensive research should keep continuing examining the required skills for online leadership, especially for managing in higher education level. Nowadays, each leader is somehow an online leader; therefore, leadership training programs should effectively prepare all leaders with the necessary skills for online contexts.

In that sense, duties in traditional education leaders have significantly changed before and after the pandemic, so now leaders should provide proper support to educators and scholars, in relation to change

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

to remote learning. Additionally, they need to become specialists in technology for virtual programs and tuition, as well as become effective communicators of regulations that are released without notice (Harris & Jones, 2020; Pollack, 2020). They must manage under remote conditions, among university members, by hard working to encourage undergraduates, motivate personnel, advising families and build trust (Harris & Jones; Pollack, 2020). That way, results should be aligned with the online competencies that leaders must recognize as remarkable in remote settings. Remote education has arisen as an advanced and transformative strength in education, because of its intrinsic technological advantage; so, most of higher education institutions have requested virtual courses as their ongoing critical strategy (Allen & Seaman, 2017).

In this context, the SEC model is one of the online leadership research instruments widely used to measure e-competencies in distance leadership, regarding the spread of information technologies, assorted usages of them, and their subsequent complexities for managing. This SEC model framework was adopted from Roman (2019). The six E-Competencies instrument measures the following critical online competencies: 1) e-communication, 2) e-social, 3) e-team, 4) e-change, 5) e-tech knowledge, and 6) e-trust; all of them influence virtual team effectiveness in organizations.

1.3. E- Communication

One set of components, extensively examined in research, is related to elementary e-communication skills: clearness, lack of communication, excess of messages, and messages conveyance. Communication effectiveness overall and group arrangements are important to enhance virtual leadership. Easiness of communication is desirable to increase quality of messages. Miscommunication, such as unintentional misunderstandings, is an issue in virtual environments (Roy, 2012; Snellman, 2014). Yet another issue is overloaded communication (Rennecker & Derks, 2012), based on the easiness of sending out messages electronically.

Furthermore, leaders must make recurrent and important decisions about the selection of adequate conducts to use, regarding providing an adequate level of media robustness (Huang et al., 2010). For instance, leaders should be skillful, especially in fast one-way communications, to improve media conveyance, because decision-making and multitask assignments require proper array of media. The imperative need for leadership support in online environments is widely mentioned in literature (Dahlstrom, 2013; Fernandez & Jawadi, 2015; Lin et al., 2008; Snellman, 2014). Digital media in organizational contexts regularly exposes informal communications and diverse types of societal closeness that contribute to deliver remarkable factors for a healthy organizational environment.

A myriad of studies has shown the substantial effect of communication in an organization's performance. Anders (2016) and Chatterjee et al. (2017) considered communication as vital to allow individuals for development, innovation, and efficiency in organizations all over the world; as an outcome, communication visibly allow individuals to develop teamwork and drive projects forward. In addition, with the use of communication technologies, virtual teams can also provide important advantages, such as an efficient use of resources by saving both time and money generated by travel costs, and the opportunity for group teams with the best offered talent (Wildman & Griffith, 2014), and the readiness to work 24/7 uninterruptedly by having co-workers in different time zones (Maznevski & Chudoba, 2000).

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

1.4. E-social

E-Social competency refers to the leader's ability to create a positive work setting and encourage collaboration over several virtual communication means (Roman, 2019). A reliable online crew should communicate through clearness, so collaboration should be stimulated and performed by online communication settings.

In terms of virtual leadership, the most frequently quoted definition, which has collected solid acceptance in the mainstream of leadership research, is the one provided by Avolio et al., (2014), where he defines it as "…a social influence process embedded in both proximal and distal contexts mediated by AITs [advanced information technologies], that produce a change in attitudes, feelings, thinking, behavior, and performance".

The development of information technologies in the workplace has brought numerous changes in organizations and their employees, shifting essential elements of the organizations, such as their performance, outcomes, structure, and culture (Jackson et al., 2014). Although technology is essential for virtual teams, some of its members do not interact on a regular basis, exhibiting lack of social skills, so they can be prone to show hostility, express untrustworthiness, and interrelate on a superficial level in contrast within person teams (Azderska & Jerman-Blazic, 2013). While virtual team's introduction has significant advantages, new challenges are arising with them (Precup et al., 2006). Cascio (2000) has demonstrated that a virtual team has five key drawbacks: reduced physical interaction, lower in person collaborations, lack of confidence, greater concern for predictability and reliability, and low social interaction occurrence. Unlike in personal teams, virtual teams regularly deal with issues such as ineffective communication, lack of social collaboration and psychological expressions. Those being human and technology aspects need to be managed, so virtual teams with characteristics like high performance, high commitment, and high collaboration and communication are desirable (Salamzadeh, 2018; Radovic & Salamzadeh, 2012; 2018).

According to Connaughton and Daly (2004), it is a challenge to reach the social presence of a leader in online environments as well as managing issues in team integration and moreover credit of members and teamwork. Armstrong and Cole (2002) and Piccoli and Ives (2004) found evidence that, to support these weaknesses, the key rely on the creation of efficient virtual leaders, who can shape social skills and lead the virtual teams to achieve success in project deliverables.

1.5. E- Team

E-team skills are well documented in the literature, and experts in the field highlight that "…virtual team leaders should do more in virtual teams" (Kahai 2013, p. 76). Elementary team skills consist of suitable set of activities, specific awareness, and job management skills (Cascio & Shurygailo, 2003; Fernandez & Jawadi, 2015; Malhotra et al., 2007).

A particular issue in virtual environments is finding strategies to keep teams and their members responsible (Bryant et al., 2009; Hertel et al., 2005; Johnson, et al., 2009; Wang et al., 2013). Ensuring acknowledgement, rewards, and improvement, based on virtual team membership and performance is the key (Hunsaker & Hunsaker 2008; Malhotra et al., 2007). The virtual leader encourages the creation of engaged and skilled teams (Bawany, 2019; Della Corte et al., 2019).

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

1.6. E- Change

E-Change management competency refers to the leader's ability to handle change management competently, over information communication technologies (Roman, 2019; Moghadam & Salamzadeh, 2018). Example of leadership capabilities resides in applying change management skills, through preparing onward changes, tracking implementation, and steadiness of being updated in technology practice (Montgomery et al., 2016).

E-change management encompasses any change in communication technologies and rearrangement of assignments through virtual settings. It is typically found that while virtual environments can provide optimistic opportunities (Puranova & Bono 2009), they also create onward challenges, especially with large technology enterprise projects (Anthopoulous et al., 2007; Bakar et al., 2016; Nah et al., 2001; U.S. Digital Service, 2016) and the transformational roles in teams.

In many studies, Virtual Leadership is known as E-Leadership. Avolio et al. (2007, p. 617) cited, "E-leadership is defined as a social influence process mediated by AIT (advanced information technologies) to produce a change in attitudes, feelings, thinking, behavior, and performance with individuals, groups, and/or organizations". However, the meaning of online leadership might have to be redefined, from a solid approach, proceeding the implication that may well be restructured as follows: In that sense, E-leadership characterizes as a social influence process, which is embedded in both proximal and distal AIT mediated contexts, that promote and motivate changes in attitudes, emotions, thought, actions and performance (Avolio, 2007; Bass & Bass, 2008).

It is known that E-leaders must keep up to date to manage any external conditions (such as changes in projects, needs, deadlines, or modifications in team objectives); thus, online leaders should foster flexibility and team effectiveness, moreover diversity and ensure changes are integrated.

1.7. E- tech knowledge

E-tech knowledge encompasses having an elementary acquaintance of several technologies, either by self-study or training (Cascio & Shurygailo 2003; Lareki et al., 2010). Underusage of more complex and cutting-edge technologies is likely among those scarce technology knowledge competence (FTI Consulting, 2015; Government Business Council, 2015; Holland et al., 2009). Technology knowledge as strength of problems solving, having a deeper understanding is required in organizations, to be able to notice critical points that are hidden in information technologies usage, which permeate humans and play an important role in their interaction with machines.

In this context, the researcher should take courses, to have an overall knowledge of virtual transition. Basics, economics, trends, and approach of virtual transformation (University of Virginia & Boston Consulting Group, 2018). Having a mindset of entire organization must have a solid IT structure. The increase of innovative virtual technologies due to the surge of arising threats, is permeative to the core of businesses. Hereafter, virtualization knowledge becomes an important duty for companies to accomplish (Rogers, 2016). Despite virtualization's effects on organizations and leaders, a gap has occurred amid the research of contemporary leadership and virtual transformation (Khan, 2016).

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

In the age of digitalization and technology, there is a necessity of increasing research that will disclose the effect of virtual transformation on leaders. For instance, 4.0 Industry and virtual transformation advances, have leverage certain attitudes, knowledge, and expertise sets (Korn, 2019; Neubauer et al., 2017; Prince, 2017; The Economist Intelligence Unit, 2017). Ravesteijn and Ongena (2019) had cited those definitions of E-leadership (also referred to as virtual leadership) derived usually from classifications of leadership in general. It is supported by Lander (2020) that associates Virtual Leadership as Technology leadership. In her literature review contribution, specified that technology leaders are coined as E-leadership.

1.8. E-trust

Building e-trust is extensively reported as significant (Greenberg et al., 2007; Hertel et al., 2006; Kanawattanachai & Yoo 2002; Malhotra et al., 2007; Rusman et al. 2010; Savolainen 2014; Snellman 2014). Creating a sense of honesty, equality, and steadiness in virtual environments is hard but nonetheless can be achieved by effective e-leaders (Avolio & Kahai 2003). Given that creative and innovative management methods are desirable, a solid sense of trust is necessary for managing virtual teams effectively (Bonatti & Horner, 2011), Thus, the virtual team leader's emotional intelligence is widely significant, and its communication and trust aspects are vital (Bryant, 2013).

Due to scarce culture of trust from leaders, employees might reject change and underperform. A culture of trust between managers and virtual employees is essential to handle the absence of in-person support. Hill et al. (2014) documented the virtual leadership traits in academic environments, that include encompassing technology appropriate for situations, fostering collaboration with shared goals, and working together through institutional restrictions.

A virtual leader, if is perceived as being untrustworthy, might influence the efficacy of the virtual team, and nurtures a negative impression of the organization from the employee's perspective. Virtual employees who do not trust their leader or their organization, typically do not expose an acceptable level of performance. As an outcome, these employees may expose lack of loyalty to the organizational and fail to completely commit to the business requirements (Goudy, 2015). If lack of trust arises, leaders might fail to properly assign the tasks, to manage to who may, or may not, be suitable, capable, or committed to do so.

2. Research Method

The present study is a quantitative method design, intended to measure the extent of virtual leadership competences, that are perceived by college professors, who are currently teaching under remote conditions, and therefore having virtual interactions with their leaders, following directions and strategies to work under online education environments.

To gather quantitative data, a sample of 115 participants was selected under specific inclusion criteria, to participate answering the instrument of this study, they belong to the business administration program in the Autonomous University of Ciudad Juarez, who also meet the criteria of having virtual interaction with their leaders for at least a period of one year. The instrument used for this purpose was the SEC (six E-Competencies) model by Roman (2019), which is a widely used scale, to measure the E-Competencies that have an impact of E-Leadership performance.

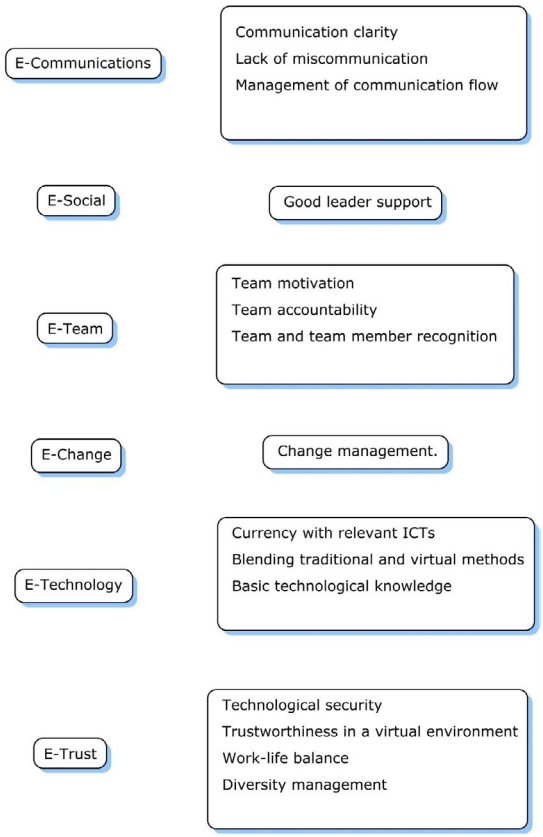
DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

The questionnaire was administrated via an online form, demographic questions were added to obtain social profile of the participants, in terms of age and gender, afterward, the responses of the questionnaire were statistically processed to acquire the descriptive statistics, a normality test was also performed, to select the appropriate correlation test among the scale dimensions, Spearman Correlation coefficient was chosen because of data do not follow a normal distribution. All the statistics were obtained using the statistical software SPSS. The minimal factor loading criteria was set to 0.5. The communality of the scale, which indicates the amount of variance in each dimension, was also assessed to ensure acceptable levels of explanation, the results show all communalities were over 0.5.

2.1. Sample demographic characteristics.

Sample was constituted by 115 participants who meet the inclusion criteria of being actively professors, working in virtual environments for at least 1 year, all of them belong to the administration sciences undergraduate program and distribution was 47.8% of women, 52.1% of men, ages range from below 30 years old, 4%, 30-39 years old, 18%, 40-49 years old, 35%, 50-59 years old, 25% and over 60 years old was 18%.

2.2. Instrument



Source: Roman (2019).

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Table 1. Definitions of the Major Elements of the SEC Model

E-competency Description	Cronbach's Alpha
E-communication: the leader can communicate via ICTs in a manner that is clear and organized, avoids errors and miscommunication, and is not excessive or detrimental to performance.	0.683
E-social: the leader can create a positive work environment and improve communication and collaboration through a variety of virtual communication methods.	0.793
E-team: the leader can build, motivate, recognize, and hold accountable teams in virtual environments.	0.752
E-change: the leader can manage change initiatives effectively through ICTs.	0.918
E-tech: the leader is technological knowledge and remains current on relevant ICT developments and ICT security-related concerns.	0.758
E-trust: the leader has the ability when using ICTs to create a sense of trust by being perceived as honest, consistent, and fair.	0.903

Source: Own elaboration based in Roman (2019).

3. Results

3.1. Hypothesis validation

The hypotheses were formulated based on the e-competences previously described, were intended to validate the correlations between the scale dimensions. Once they were tested insightful evidence was found that contributes to improving leadership performance in virtual education environments.

H1: There is a positive correlation between the professors and their leaders, regarding Competence (E-Communications).

A moderated correlation coefficient of 0.463 was found related with E-Social competence, that means, social interactions are somehow encouraging and fostering communications among the teachers and their leaders.

H2: There is a positive correlation between the professors and their leaders, regarding Competence (E-Social).

A moderated level of correlation significance 0.496 arises in terms of E-Change, it is probably because, the leaders are prone to support any change in communication technologies use, rearrangement of assignments through virtual settings and stimulating the flexibility and diversity to their teachers.

H3: There is a positive correlation between the professors and their leaders, regarding the Competence (E-Team).

A moderated level of correlation of 0.475 exist in terms of technology adaptations, it is demonstrated a certain degree of training programs, courses oriented to leverage the knowledge of use technology tools, which permeate in the effectiveness of teamwork.

H4: There is a positive correlation between the professors and their leaders, regarding the Competence (E-Change).

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

A high level of correlation 0.769, was found in terms of trust building, because of the transition to virtual settings are being supportive in a closely manner by the leaders, providing the necessary assistance to professors, on every setting they need it, oriented to enhance long term relationships in between.

H5: There is a positive correlation between the professors and their leaders, regarding Competence (E-Technology).

A moderated level of correlation of 0.475 exists in terms of virtual setting adaptation, the updated technology use permeates in the easiness of transition to virtual tasks for academics.

H6: There is a positive correlation between the professors and their leaders, regarding the Competence (E-Trust).

A high level of correlation 0.769, was found in terms of change to virtual settings, because of this transition is being supportive on every step by the leaders, providing the necessary follow-up to professors, counseling and mentoring in all activities they need support.

3.2. Statistical Analysis

Below are shown the results of the questionnaire responses. First, descriptive statistics are displayed, average and standard deviation categorized by each scale. Each scale reflects the trend that was found for professors at the university, regarding their perceptions about the virtual leadership they are receiving from their immediate leaders.

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ECOM	115	1.33	5.00	3.5246	.78864
ESOC	115	1.33	4.67	3.4696	.71451
ETEAM	115	1.00	5.00	3.3507	.63957
ECHANGE	115	1.00	5.00	4.0058	.98822
ETECH	115	1.00	5.00	3.4899	.60589
ETRUST	115	1.00	5.00	4.2116	.92962
Valid N (listwise)	115				

Source: Own elaboration.

The KMO statistic is a Measure of Sampling Adequacy, both overall and for each variable (Kaiser 1970; Cerny & Kaiser 1977; Dziuban et al.,1979). KMO values greater than 0.8 can be considered acceptable, usually occurs when most of the zero-order correlations are positive. KMO values less than .5 occur when most of the zero-order correlations are negative. KMO values less than 0.5 require remedial action, either by deleting the offending variables or by including other variables related to the offenders.

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Table 3. KMO and Bartlett's test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.934
Bartlett's Test of Sphericity	Approx. Chi-Square	1499.692
	df	153
	Sig.	.000

Source: Own elaboration.

To perform the correlation analysis was necessary previously run the normality, so the eligibility of the correlation coefficient can be suitable. The results table below shows data do not follow a normal distribution, therefore the Spearman correlation coefficient was selected for the study.

Table 4. Normality tests

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ECOM01	.318	115	.000	.701	115	.000
ECOM02	.302	115	.000	.785	115	.000
ECOM03	.259	115	.000	.775	115	.000
ESOC01	.208	115	.000	.862	115	.000
ESCO02	.253	115	.000	.817	115	.000
ESOC03	.263	115	.000	.797	115	.000
ETEAM01	.212	115	.000	.866	115	.000
ETEAM02	.222	115	.000	.839	115	.000
ETEAM03	.213	115	.000	.869	115	.000
ECHANGE01	.292	115	.000	.795	115	.000
ECHANGE02	.254	115	.000	.805	115	.000
ECHANGE03	.286	115	.000	.759	115	.000
ETECH01	.279	115	.000	.798	115	.000
ETECH02	.302	115	.000	.745	115	.000
ETECH03	.268	115	.000	.761	115	.000
ETRUST01	.295	115	.000	.743	115	.000
ETRUST02	.295	115	.000	.734	115	.000
ETRUST03	.281	115	.000	.772	115	.000

a. Lilliefors Significance Correction

Source: Own elaboration.

The Spearman correlation coefficient, rho, (greek letter) can take values from +1 to -1. A rho of +1 indicates a perfect association of ranks, a rho of zero indicates no association between ranks and a rho of -1 indicates a perfect negative association of ranks. The closer rho is to zero, the weaker the association between the ranks. In the following table moderated and strong enough correlations are highlighted:

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Table 5. Correlations

			ECOM	ESOC	ETEAM	ECHANGE	ETECH	ETRUST
Spearman's rho	ECOM	Correlation Coefficient	1.000	.463**	.296**	.241**	.322**	.241**
		Sig. (2-tailed)	.	.000	.001	.010	.000	.009
		N	115	115	115	115	115	115
	ESOC	Correlation Coefficient	.463**	1.000	.359**	.496**	.292**	.332**
		Sig. (2-tailed)	.000	.	.000	.000	.002	.000
		N	115	115	115	115	115	115
	ETEAM	Correlation Coefficient	.296**	.359**	1.000	.393**	.475**	.229*
		Sig. (2-tailed)	.001	.000	.	.000	.000	.014
		N	115	115	115	115	115	115
	ECHANGE	Correlation Coefficient	.241**	.496**	.393**	1.000	.433**	.769**
		Sig. (2-tailed)	.010	.000	.000	.	.000	.000
		N	115	115	115	115	115	115
	ETECH	Correlation Coefficient	.322**	.292**	.475**	.433**	1.000	.379**
		Sig. (2-tailed)	.000	.002	.000	.000	.	.000
		N	115	115	115	115	115	115
	ETRUST	Correlation Coefficient	.241**	.332**	.229*	.769**	.379**	1.000
		Sig. (2-tailed)	.009	.000	.014	.000	.000	.
		N	115	115	115	115	115	115
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Source: Own elaboration.

4.Discussion and Conclusions

After the study was conducted, insightful outcomes were found, that potentially lead to new directions in virtual leadership improvement in higher education. Perceptions of professors at each scale competencies demonstrate that, in their virtual communication, the leaders are being clear, well organized, and allow feedback to avoid mistakes and unverified assumptions.

The findings of this research are important for organizations around the world, so they could understand and implement virtual communication and take advantage of technologies for the efficient development of organizations, their work teams and the flow of information emphasizing that efficient communication is key for work teams.

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Virtual leadership in education, as several authors have mentioned, is a component of the advanced education context. Therefore, competencies needed to be addressed to shape the designed strategies for online education improvement. Of the group of competencies studied, the one that shows the highest Cronbach's Alpha was E-change, based on what the leader can manage change initiatives effectively through ICTs with .918; followed by E-trust competition, where the leader has the ability when using ICTs to create a sense of trust by being perceived as honest, consistent, and fair and the lowest is communication, where it shows the opportunity to improve strategies for the implementation of virtual communication towards the efficiency of companies.

It also was found that trust building, because of the transition to virtual settings are being supportive in a closely manner by the leaders, providing the necessary assistance to professors, on every setting they need it, oriented to enhance long term relationships in between an opportunity to continue improving virtual scenarios. The work of the competencies and seeing what is projected in the educational scenario shows its impact on virtual leadership and its way in the educational environment to develop suitable virtual ambiences for the development of significant learning, efficient collaborative work, and important results for the necessary communications.

The outcomes of the study have revealed that moderated correlations have been found in competences such as e-communications and e-change with e-social, exposing the barely enough labor of leaders, fostering social interaction, as well as e-team with e-technology, showing the regular basis training of the use of ICT's. Of course, the above moderated correlations indicate the need for improvement on these competencies.

Moreover, a high level of correlation 0.769, was found of e-change with trust building, which demonstrates the effort of leaders are doing in terms of, the proactive and closely collaboration with the teachers, building bonds of trust that effectively encourage, the achievement of goals in online education.

It is necessary to continue all the hard work and acknowledgement about the management of virtual education settings; thus, online education environments will continue growing at every level of education, new generations are feeling more comfortable working in this context, and this requires enhance the leadership e-competences, to provide the tailored service they need it.

References

Allen, I. E. y Seaman, J. (2017). *Digital learning compass: Distance education enrollment report 2017*. Recuperado de: https://onlinelearningsurvey.com/reports/digtiallearningcompassenrollment2017.pdf.

Anders, A. (2016). Team communication platforms and emergent social collaboration practices. *International Journal of Business Communication, 53*(2), 224-261. DOI: https://doi.org/10.1177/2329488415627273.

Anthopoulos, L., Siozos, P., y Tsoukalas, I. (2007). Applying participatory design and collaboration in digital public services for discovering and re-designing e-government services. *Government Information quarterly*, *24*(2), 353-376. DOI: https://doi.org/10.1016/j.giq.2006.07.018.

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Armstrong, D. J., y Cole, P. (2002). Managing distances and differences in geographically distributed work groups. En Hinds, P. y Kiesler, S. (Eds), *Diversity in work teams: Research paradigms for a changing workplace* (pp.167-186). DOI: https://psycnet.apa.org/doi/10.1037/10189-007.

Avolio, B. J. (2007). Promoting more integrative strategies for leadership theory-building. *American psychologist*, *62*(1), 25-33. DOI: https://doi.org/10.1037/0003-066X.62.1.25.

Avolio, B. J., y Kahai, S. S. (2003). Adding the "E" to E-leadership: How It May Impact Your Leadership. *Organizational Dynamics*, *31*(4), 325-38. Recuperado de: https://d1wqtxts1xzle7.cloudfront.net/89291420/Org_Dynamics_31_2002_Avolio-libre.pdf?1659697949=&response-content-disposition=inline%3B+filename%3DAdding_the_E_to_E_Leadership.pdf&Expires=1701917247&Signature=Hr98qDRRDqrMjlJ-~PKACyR1Hq~Fui0VlklDF5XTRNUMIrvxld1FGlYdt0cCQAzCAduDLTwBd8pUWzLnowwAgRbhdbKEJpNOpPuBfKJRgfIhIIVsPikzhG1qdm~Xu86FSX~A4iqwZteBHO-xq-FMYkBeDh2TUoDCw1756-DyOiigxLjBhpKloTAtw41qTHtVMqLqldOcDdqemYTTTQqo5vT1umGkuhihcAgRPmldMVXt0O6-7r~MD1yI5eVAN69tqObL31TPJfo~iT3MBk77EtGMsd8aaZkg8rtdoe8k7L4TNnqQTJitpuCcyft0LWDSLqaO7jZyi8PL65-TvEhxOw__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA.

Avolio, B. J., Sosik, J. J., Kahai, S. S. y Baker, B. (2014). E-leadership: Re-examining transformations in leadership source and transmission. *Leadership Quarterly*, *25*(1), 105-131. DOI: https://doi.org/10.1016/j.leaqua.2013.11.003.

Azderska, T. y Jerman-Blazic, B. (2013). A holistic approach for designing humancentric trust systems. *Systemic Practice and Action Research*, *26*(5), 417-450. DOI:10.1007/s11213-012-9259-3.

Bakar, N. A., Kama, N., y Harihodin S (2016). Enterprise architecture development and implementation in public service: The Malaysian perspective. *Journal of Theoretical & Applied Information Technology*, *88*(1), 176-188.

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human behavior and emerging technologies*, *2*(2), 113-115. DOI: https://doi.org/10.1002/hbe2.191.

Barbour, M. K., LaBonte, R., Kelly, K., Hodges, C., Moore, S., Lockee, B., Trust, T., Bond, A., y Hill, P. (2020). Understanding pandemic pedagogy: Differences between emergency remote, remote, and online teaching. *Canadian eLearning Network*. Recuperado de: http://hdl.handle.net/10919/101905.

Bass, B. M., y Bass, R. (2008). *The Bass handbook of leadership: Theory, research, and managerial applications*. Simon and Schuster.

Bawany, S. (2019). Leadership 4.0: How ready are you to be a digital leader? *Leadership Excellence*, *36*(2), 28-30.

Beauchamp, G., Hulme, M., Clarke, L., Hamilton, L., y Harvey, J. A. (2021). 'People miss people:' A study of school leadership and management in the four nations of the United Kingdom in the early stage of the pandemic. *Educational Management Administration and Leadership*, *49*(3), 375-392. DOI: https://doi.org/10.1177/1741143220987841.

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Bonatti, A. y Horner, J. (2011). Collaborating. *American Economic Review*, 101. 632-663. DOI: http://dx.doi.org/10.1257/aer.101.2.632.

Bryant, N. (2013). *Leadership development as a relational process: A grounded theory investigation of leader experiences*. Tesis doctoral. The Chicago School of Professional Psychology. Recuperado de: https://www.proquest.com/openview/ddacacf300e14a8241d90901dd45d06d/1?pq-origsite=gscholar&cbl=18750.

Bryant, S. M., Albring, S. M., y Murthy, U. (2009). The Effects of Reward Structure, Media Richness and Gender on Virtual Teams. *International Journal of Accounting Information Systems*,*10*(4), 190-213. DOI: https://doi.org/10.1016/j.accinf.2009.09.002.

Caillier, J. G. (2014). Toward a better understanding of the relationship between transformational leadership, public service motivation, mission valence, and employee performance: A preliminary study. *Public Personnel Management*, *43*(2), 218-239. Recuperado de: https://search.proquest.com/docview/1665117205?accountid=35812.

Cascio, W. F. (2000). Managing a virtual workplace. *Academy of Management Perspectives*, *14*(3), 81-90. DOI: https://doi.org/10.5465/ame.2000.4468068.

Cascio, W. F., y Shurygailo, S. (2003). E-leadership and virtual teams. *Organizational Dynamics*, *31*(4), 362-376. DOI: https://doi.org/10.1016/S0090-2616(02)00130-4.

Cerny, B. A., y Kaiser, H. F. (1977). A study of a measure of sampling adequacy for factor-analytic correlation matrices. *Multivariate behavioral research*, *12*(1), 43-47. DOI: https://doi.org/10.1207/s15327906mbr1201_3.

Chatterjee, S., Sarker, S. y Siponen, M. (2017). How do mobile ICTs enable organizational fluidity: toward a theoretical framework. *Information and Management*, *54*(1), 1-13. DOI: https://doi.org/10.1016/j.im.2016.03.007.

Connaughton, S. L., y Daly, J. A. (2004). Identification with leader: A comparison of perceptions of identification among geographically dispersed and co-located teams. *Corporate Communications: An International Journal*, *9*(2), 89-103. DOI: https://doi.org/10.1108/13563280410534294.

Dahlstrom, T. R. (2013). Telecommuting and Leadership Style. *Public Personnel Management*, *42*(3), 438-51. DOI: https://doi.org/10.1177/0091026013495731.

Della Corte, V., Del Gaudio, G., y Sepe, F. (2019). Leadership in the digital realm: What are the main challenges. *Digital Leadership-A New Leadership Style for the 21st Century*, 1-15. DOI: https://doi.org/10.5772/intechopen.89856.

Dziuban, C. D., Shirkey, E. C., y Peeples, T. O. (1979). An investigation of some distributional characteristics of the measure of sampling adequacy. *Educational and Psychological Measurement*, *39*(3), 543-549. DOI: https://doi.org/10.1177/001316447903900304.

Ekmekci, O. (2013). Being there: Establishing instructor presence in an online learning environment. *Higher Education Studies*, *3*(1), 29-38. Recuperado de: https://eric.ed.gov/?id=EJ1081361

Fernandez, D. B., y Jawadi, N. (2015). Virtual R&D Project Teams: From E-leadership to Performance. *Journal of Applied Research*, *31*(5), 1693-1708. DOI: https://doi.org/10.19030/jabr.v31i5.9384.

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Francisco, C. D. C., y Nuqui, A. V. (2020). Emergence of a situational leadership during COVID-19 pandemic called new normal leadership. *International Journal of Interdisciplinary Research*, *4*(10), 15-19. Recuperado de: https://eric.ed.gov/?id=ED608560.

FTI Consulting (2015). *U. S. Postsecondary Faculty in 2015: Diversity in People, Goals and Methods, but Focused on Students*. FTI Consulting. Recuperado de: http://postsecondary.gatesfoundation.org/wpcontent/uploads/2015/02/US-postsecondaryFaculty-in-2015.pdf.

Goudy, K. (2015). *A qualitative case study of manager trustworthiness of employees in the virtual workplace*. Tesis doctoral. Northcentral University. Recuperado de: https://www.proquest.com/openview/b4480d449a11dcc7a076357eb9d7bb7e/1?pq-origsite=gscholar&cbl=18750.

Government Business Council (2015). *Delivering on Digital Government: A Candid Survey of Federal Managers*. Government Business Council. Recuperado de: http://cdn.govexec.com/media/gbc/docs/gbc_accenture_digital_ir_april.pdf.

Greenberg, P. S., Greenberg, R. H., y Antonucci, Y. L. (2007). Creating and sustaining trust in virtual teams. *Business horizons*, *50*(4), 325-333. DOI: https://doi.org/10.1016/j.bushor.2007.02.005.

Harris, A., y Jones, M. (2020). COVID-19-school leadership in disruptive times. *School Leadership and Management*, *40*(4), 243-247. DOI: https://doi.org/10.1080/13632434.2020.1811479.

Hertel, G., Konradt, U., y Voss, K. (2006). Competencies for Virtual Teamwork: Development and Validation of a Web-Based Selection Tool for Members of Distributed Teams. *Organizational Psychology*, *15*(4), 477-504. DOI: https://doi.org/10.1080/13594320600908187.

Hill, N., Kang, J., y Seo, M. (2014). The interactive effect of leader–member exchange and electronic communication on employee psychological empowerment and work outcomes. *Leadership Quarterly*, *25*(4), 772-783. DOI: https://doi.org/10.1016/j.leaqua.2014.04.006.

Holland, J. B., Malvey, D., y Fottler, M. (2009). Heath care globalization: A need for virtual leadership. *The Health Care Manager*, *28*(2), 117-123. DOI: https://doi.org/10.1097/HCM.0b013e3181a2cb63.

Huang, R., Kahai, S., y Jestice, R. (2010). The Contingent Effects of Leadership on Team Collaboration in Virtual Teams. *Computers in Human Behavior*, *26*(5), 1098-1110. DOI: https://doi.org/10.1016/j.chb.2010.03.014.

Hunsaker, P. L., y Hunsaker, J. S. (2008). Virtual Teams: A Leader's Guide. *Team Performance Management*, 14(1–2), 86-101. DOI: https://doi.org/10.1108/13527590810860221.

Jackson, S. E., Schuler, R. S., y Jiang, K. (2014). An aspirational framework for strategic human resource management. *Academy of Management Annals*, *8*(1), 1-56. DOI: https://doi.org/10.5465/19416520.2014.872335.

Johnson, S. K., Bettenhausen, K., y Gibbons, E. (2009). Realities of Working in Virtual Teams: Affective and Attitudinal Outcomes of Using Computer-Mediated Communication. *Small Group Research*, *40*(6), 623-49. DOI: https://doi.org/10.1177/1046496409346448.

Kahai, S. S. (2013). *Leading in a digital age: What's different, issues raised, and what we know. Exploring Distance in Leader–Follower Relationships: When Near is Far and Far is Near*. Routledge. Recuperado de: https://www.taylorfrancis.com/chapters/edit/10.4324/9780203120637-6/leading-digital-age-different-issues-raised-know-surinder-kahai.

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Kaiser, H. F. (1970). A second-generation little jiffy. *Psychometrika*, 35, 401-415. DOI: https://doi.org/10.1007/BF02291817.

Kanawattanachai, P., y Yoo, Y. (2002). Dynamic nature of trust in virtual teams. The *Journal of Strategic Information Systems*, *11*(3-4), 187-213. DOI: https://doi.org/10.1016/S0963-8687(02)00019-7.

Khan, S. (2016). *Leadership in the digital age - a study on the effects of digitalisation on top management leadership*. Tesis de maestría. Stockholm University. Recuperado de: https://su.diva-portal.org/smash/get/diva2:971518/FULLTEXT02.pdf.

Ferry, K. (2019). *The self-disruptive leader*. Korn Ferry Institute. Recuperado de: https://focus.kornferry.com/wp-content/uploads/2015/02/KF-Disruptive-Leader-Final-DigitalSpreads_FINAL.pdf.

Lander, J. (2020). *The relationship between principals' pillars of digital leadership aligned values and actions and teacher technology use*. Tesis doctoral. St. John's University. Recuperado de: https://www.proquest.com/openview/d1f65f24c6fd35183bcfd67a41ddb374/1?pq-origsite=gscholar&cbl=18750&diss=y.

Lareki, A., de Morentin, J. I. M., y Amenabar, N. (2010). Towards an efficient training of university faculty on ICTs. *Computers & Education*, *54*(2), 491-497. DOI: https://doi.org/10.1016/j.compedu.2009.08.032.

Lin, C., Standing, C., y Liu, Y. (2008). A Model to Develop Effective Virtual Teams. *Decision Support Systems*, *45*(4), 1031-1045. DOI: https://doi.org/10.1016/j.dss.2008.04.002.

Malhotra, A., Majchrzak, A., y Rosen, B. (2007). Leading virtual teams. *Academy of Management Perspectives*, *21*(1), 60-70. DOI: https://doi.org/10.5465/amp.2007.24286164.

Maznevski, M. L., y Chudoba, K. M. (2000). Bridging space over time: Global virtual team dynamics and effectiveness. *Organization science*, *11*(5), 473-492. DOI: https://doi.org/10.1287/orsc.11.5.473.15200.

Moghadam, S. J., y Salamzadeh, A. (2018). Do senior bankers care about entrepreneurial behaviour? case of senior managers of Iranian vanguard banks. *World Review of Entrepreneurship, Management and Sustainable Development*, *14*(1-2), 271-287. DOI: https://doi.org/10.1504/WREMSD.2018.089065.

Montgomery, V. A. N., Roman, A., y Pierce, S. (2016). The rise and effect of virtual modalities and functions on organizational leadership: Tracing conceptual boundaries along the emanagement and e-leadership continuum. *Transylvanian Review of Administrative Sciences*, *12*(SI), 102-122. Recuperado de: https://rtsa.ro/tras/index.php/tras/article/view/507.

Nah, F., Lau, J., y Kuang, J. (2001). Critical factors for successful implementation of enterprise systems. *Business Process Management Journal*, *7*(3), 285-296. DOI: https://doi.org/10.1108/14637150110392782.

National Association of Elementary School Principals (2020). *NAESP releases results of National Survey of principals regarding COVID-19*. National Association of Elementary School Principals. Recuperado de: https://www.naesp.org/news/naesp-releases-results-of-national-survey-of-principals-regarding-covid-19/.

Neubauer, R., Tarling, A., y Wade, M. (2017). *Redefining leadership for a digital age*. Global Center for Digital Business Transformation and meta Beratung GmbH. Recuperado de: https://www.imd.org/globalassets/dbt/docs/redefining-leadership.

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Orcutt, J. M., y Dringus, L. P. (2017). Beyond being there: Practices that establish presence, engage students, and influence intellectual curiosity in a structured online learning environment. *Online Learning*, *21*(3), 15-35. Recuperado de: https://eric.ed.gov/?id=EJ1154155.

Peart, D. (2014). *The relationship between emotional intelligence and transformational leadership behavior in virtual academic leaders*. Tesis doctoral. Grand Canyon University. Recuperado de: http://search.proquest.com.proxy1.ncu.edu/docview/1528557765?accountid=28180.

Piccoli, G., y Ives, B. (2004). Trust and the unintended effects of behavior control in virtual teams. *MIS quarterly*, *27*(3), 365-395. DOI: https://doi.org/10.2307/30036538.

Pollack, K. (2020). School leaders' work during the COVID-19 pandemic: A two-pronged approach. *International Studies in Education*, *48*(3), 38-44. Recuperado de: https://ir.lib.uwo.ca/edupub/268/.

Precup, L., O Sullivan, D., Cormican, K., y Dooley, L. (2006). Virtual team environment for collaborative research projects. *International Journal of Innovation and Learning*, *3*(1), 77-94. DOI: https://doi.org/10.1504/IJIL.2006.008181.

Prince, K. A. (2017). *Industry 4.0 and leadership*. Proceedings of the 17th International Conference on Electronic Business, 132-139.

Purvanova, R. K., y Bono, J. E. (2009). Transformational leadership in context: Face-to-face and virtual teams. *Leadership Quarterly*, *20*(3), 343-357. DOI: https://doi.org/10.1016/j.leaqua.2009.03.004.

Ravesteijn, P., y Ongena, G. (2019). *The role of E-leadership in relation to IT capabilities and digital transformation*. IADIS Proceedings. Recuperado de: https://www.researchgate.net/profile/Guido-Ongena/publication/332370384_The_Role_of_e-Leadership_in_Relation_to_IT_Capabilities_and_Digital_Transformation/links/5cb04903299bf120975f914e/The-Role-of-e-Leadership-in-Relation-to-IT-Capabilities-and-Digital-Transformation.pdf.

Radovic, M., y Salamzadeh, A. (2012). *The nature of entrepreneurship: Entrepreneurs and entrepreneurial activities*. Lap Lambert Academic Publishing. Recuperado de: http://ebooks.ien.bg.ac.rs/1008/.

Radovic, M., y Salamzadeh, A. (2018). *The importance of communication in business management.* 7th International Scientific Conference on Employment, Education and Entrepreneurship. Recuperado de: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3578378.

Rennecker, J., y Derks, D. (2012). Email overload: Fine-tuning the research lens. En Derks, D. y Bakker, A. B. (Eds), *The Psychology of Digital Media at Work*. Psychology Press. DOI: doi.org/10.4324/9780203074145.

Rogers, D. L. (2016). *The digital transformation playbook: Rethink your business for the digital age*. Colombia University Press. DOI: https://doi.org/10.7312/roge17544.

Roman, A. V. (2019). Defining e-leadership as competence in ICT-mediated communications: an exploratory assessment. *Public Administration Review*, *79*(6), 853-866. DOI: https://doi.org/10.1111/puar.12980.

DOI: http://dx.doi.org/10.20983/novarua.2023.27.4

Roy, S. (2012). Virtual collaboration: The skills needed to collaborate in a virtual environment. *Journal of Internet Social Networking & Virtual Communities*, *2012*, 1-8. DOI: https://doi.org/10.5171/2012.629512.

Rusman, E., Van Bruggen, J., Sloep, P., y Koper, R. (2010). Fostering Trust in Virtual Teams: Towards a Design Framework Grounded in Trustworthiness Antecedents. *International Journal of Human-Computer Studies*, *689*(11), 834-50.

Salamzadeh, A. (2018). Start-up boom in an emerging market: A niche market approach. En Khajeheian, D., Friedrichsen, M. y Mödinger, W. (Eds.), *Competitiveness in emerging markets* (pp. 233-243). Springer. Recuperado de: https://link.springer.com/book/10.1007/978-3-319-71722-7.

Savolainen, T. (2014). Trust-building in e-leadership: A case study of leaders' challenges and skills in technology-mediated interaction. *Journal of Global Business Issues*, *8*(2), 45-56. Recuperado de: https://web.s.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=1&sid=ddb2c6a3-386f-4ce0-b07b-16d28b5ab95a%40redis.

Snellman, C. (2014) Virtual teams: Opportunities and challenges for e-leaders. *Procedia-Social and Behavioral Sciences*, 110, 1251-1261. DOI: https://doi.org/10.1016/j.sbspro.2013.12.972.

The Economist Intelligence Unit (2017). *Building leaders without silos*. The Economist. Recuperado de: https://eiuperspectives.economist.com/strategy-leadership/building-leaders-without-silos/whitepaper/building-leaders-without-silos.

University of Virginia & Boston Consulting Group (2018). *In Digital Transformation*. Coursera. Recuperado de: https://www.coursera.org/learn/bcg-uva-darden-digital-transformation.

U. S. Digital Service (2016). *U. S. Digital Services Playbook*. U.S. Digital service. Recuperado de: https://digital.gov/.

Varela, D. G., y Fedynich, L. (2020). Leading schools from a social distance: Surveying South Texas school district leadership during the COVID-19 pandemic. *National Forum of Educational Administration and Supervision Journal*, *38*(4), 1-10. Recuperado de: http://www.nationalforum.com/Electronic%20Journal%20Volumes/Varela,%20daniella%20Surveying%20South%20Texas%20School%20District%20Leadership%20NFEASJ%20V38%20N4%202020.pdf.

Wang, J., Tian, J., y Shen, Z. (2013). The Effects and Moderators of Cyberloafing Controls: An Empirical Study of Chinese Public Servants. *Information Technology Management*, *14*(4), 269-82. Recuperado de: https://link.springer.com/article/10.1007/s10799-013-0164-y.

Wildman, J. L., y Griffith, R. L. (Eds.). (2014). *Leading global teams: Translating multidisciplinary science to practice*. Springer. Recuperado de: https://link.springer.com/book/10.1007/978-1-4939-2050-1.

Williams, T., Layne, M., y Ice, P. (2014). Online faculty perceptions on effective faculty mentoring: A qualitative study. *Online Journal of Distance Learning Administration*, *17*(2), 1-19. Recuperado de: https://ojdla.com/archive/summer172/Williams_Layne_Ice172.pdf.