Telework, virtual work or telework : skills for work in the urgency of a major crisis

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Abstract

The research aimed to define competencies for telework through a systematic review of the literature, through a two-stage survey: (I) bibliographic survey in the Web of Science (WoS) database, and (II) selection of articles published between the years 2016 and 2020, after reading the abstracts, based on the criterion of adherence to the research theme, and further appreciation and presentation of the studies. As a result, the definitions of the competencies for telework are gathered around four macro-competencies, which situate knowledge, skills, attitudes and values necessary for the virtual context, which combine the separation of technical and support competencies with the words "Collaborative work", "Problem-based learning", "Team work" and Interculture. These are: (I) Technical-operational competencies for telework, (II) Technical-relational competencies for telework, (III) Support organizational-managerial competencies for telework, (IV) Leadership organizational competencies in supporting telework. Derived from the discussions, it is considered, in the context of "big crisis", it is suggested analysis on mental health and on the values of openness (innovation and expression of creativity) associated with the challenges for the development of competencies for telework.

Key-Words: Competencies. Telework. Virtual Work. Telework. Crisis

1 Introduction

Telework, virtual work or telework is increasingly becoming a labor mode adopted in various organizations, public and private, representing a labor trend in the information society, particularly

associated with the effects of the ongoing digital revolution (Sapién-Aguilar et al. 2016) and advancement in the use of Information and Communication Technologies (ICTs) (Hossein, 2012).

With requirements related to digital literacy or competence, as expressed by the European Council for Vocational Training in the Information Society (cepis, 2007), knowledge, skills and attitudes grounded in technologies, the use of hardware and software (hard skills), with the development of other related skills (social skills), representing key competencies for the 21st century (Esteve, Adell & Gisbert, 2013).

In this path, the interaction between technology and organization is the result of social and historical contexts that delimit the use, with the limits and possibilities anchored by social actors, their experiences and meanings (Meirelles et al., 2017). With the advancement of technological capability, considered fundamental for companies and countries (Teece, Rumelt, Dosi & Winter, 1994, McKelvey, 1982, Lall, 1992, 1994), it is found that the development of competencies is related to new products and processes (Danneels, 2002).

Although widely used in academia, the concept "competence" is diffuse (Adelsberger, Ehlers & Schneckenberg, 2008), which reinforces the contextualization of its theorization, supported by the social movement around the needs of the market and society around performance. The conceptualization involves the relationship of man with work, from the perspective of action, of his performance, or human compentence at work (Sandberg, 2000).

In recent years, Coelho Júnior, Faiad, and Rêgo (2018) report that, due to the need to develop management models capable of satisfactorily responding to social and economic demands, the concept "competence" has been revalued. Through the combination of cognitive and motivational components, in the manifestation of knowledge, skills and values (Schneckenberg, 2010), the idea of innovation is observed when competencies situate the search for problem solving (Van der Blij, 2002), in the perspective of adding value to the organization (Fischer, Dutra, Ruas & Nakata, 2008), to ensure performance levels that meet social and market demands (Ruas, 2005, Le Boterf, 2003; Zarifian, 2011).

Based on the abstraction of the concept and reference to the context of analysis, it is understood that the competencies can be configured in remote work context with diversified requirements of other working modalities, which meets the statement of Schönwald (2003), about the need to strengthen institutional conditions that form the necessary structure for the institutionalization of competencies.

Given the challenges and potentialities, Pereira and Freitas (2019) reinforce that projects aimed at remote work need to be better defined, with precise rules and accurate analysis of the technologies involved, given the need for alignment in favor of the competencies required and to be developed. For Grisham (2011), leaders are essential, particularly in terms of socioemotional skills (soft skills), with management skills (hard skills) being less relevant.

With “remote” as the most strengthened labor trend in developed countries (Sapién-Aguilar et al, 2016), but intensively explored in the world due to the pandemic of the new Coronavirus in the year 2020, one can assume the urgency of studies aimed at apprehending, understanding and delimiting skills for telework, virtual work or telework, which can help developing countries to explore more the potentialities of the modality and minimize the challenges, in order to contribute with the improvement of the organizations' responses to the economic crisis experienced throughout 2020 and that presents itself in

the first months of 2021, due to the new coronavirus (SARS-CoV-2), now considered as one of the biggest health problems of the century (Who, 2020).

With the possibility that remote work can be more widespread, both by necessity (as in the case of possible pandemics) and by the glimpse of benefits that can add to people and organizations, there is an increased interest in understanding how it can be better developed and, also, with the various discussions that can be raised from the use on a wider scale of telework, there is the issue of identifying specific skills to be developed by remote workers. With the definitions, the article presents the synthesis of the competencies through a theoretical design, in order to support policies and practices aimed at telework, as well as future researches that investigate this issue.

The research assumes the challenge suggested by Costa et al. (2020): to produce knowledge simultaneously to the events still under reflection about the impacts of the crisis arising from the new coronavirus, in this article presented as "great crisis", that crosses people, organizations and society, which mobilizes looks on the business, social and environmental dimensions, with the construction of new narratives (Silveira etl al., 2020), associated with the engagement of university institutions to face the current context (Brauner et al., 2020).

In overcoming a descriptive presentation of the literature (or the situation of great crisis) on the subject "competencies for telework", the study also seeks to systematize a theoretical design that coordinates competencies that may favor remote work and, as a result, contribute to positive changes, as suggested by Costa et al. (2020), given the acceleration towards technology and digitalization that a prospective analysis suggests (Silveira etl al., 2020).

2 Telework, virtual work or telework

The name telework derives from the English term telework and characterizes the modalities of work performed remotely, with the mediation of information and communication technology tools (Eurofound & The International Labour Office, 2017). Several other designations are also used to name these forms of work, such as telecommuting and virtual work, the characterization being of workplace mobility, no longer tied to a physical location within an organization (Messenger, 2019).

Studies on work and the virtual world are not recent. Avolio et al. (2014), for example, recall that e-Leadership was already being studied in the early 2000s (Avolio et al. 2000), and this is considered seminal research on the topic. In general, studies reinforce positive aspects of telecommuting, such as reduced rental costs, greater ability to integrate qualified people for jobs, and improved quality of life due to greater flexibility to the work models adopted in homeoffice (Timms et al., 2015).

Studies that aim to understand the dynamics of competencies in virtual work for Distance Learning (DE) are recurrent, such as the research by Meirelles et al. (2017), which shows low development of technological skills due to resistances in the adoption of technologies involved; of Cassundé, Mendonça, and Barbosa (2017), who define "e-skills" or "e-competencies", reinforcing that teachers need to keep in touch with new generations; Coelho Júnior, Faiad and Rêgo (2018), Beraldo and Maciel (2016), Mattar et al (2020) situate the need for technological skills, in addition to other competencies, such as managerial and communicational, as well as collective learning; Almeida and

Santos (2017), study competencies for DE at the operational level, or technical-pedagogical, which involves the conceptual separation of competencies defined by Gramigna (2007): the technical competencies and the support competencies (which underpin the technical ones); Jiménez and Azofeifa (2018), seek to understand the "level" of competencies of teachers in Costa Rica, recommending greater investment in collaborative knowledge construction; García-Cabrero et al., (2018), furthermore, presents an evaluation model for skills in virtual work, called the Model for Evaluating Teacher Competencies for Teaching inLine (MECDL) and, on the same path, Luna Serrano and Villafaña (2020) present the development of a formative evaluation questionnaire of competencies for online teaching.

Leaving the context of DE, Iulia and Dumitru (2017), when identifying low success rate, increased demands for international projects and, furthermore, that 70% of these projects fail, studied skills and competencies of managers for virtual work, concluding that prior preparation is an essential factor for the transformation of technology into competitive advantage; Maduka et al (2017), in the same view, advance in the analysis of competencies for the effective leadership of virtual teams; Sapién-Aguilar et al, (2016) studied ICTs in order to define competencies for virtual work in organizations in Mexico. Pereira and Freitas (2019), also, study the context of remote work, from the perspective of managers' competencies; Krumm et al. (2016) defines a competency model focused on virtual collaboration; and, finally, Van Wart et al (2019), presents the operationalization of the definition on e-leadership, which integrates telework, team and company settings, based on six factors (or broad e-competencies - electronic communication, electronic social skills, electronic team building skills, electronic change management, electronic technology skills and electronic reliability).

Studies portray that virtual teamwork in which the paradigm of time and space are broken (Sapién-Aguilar et al., 2016), has challenges and potential, for people and companies, because and has changed the ways in which work is organized and managed (Jarvempaa & Tanriverdi, 2003). On the one hand, work management is crossed by the exercise of independence and autonomy, which demands to strengthen managerial and self-management skills (Vartiainen, 2008), being transformational leadership a style presented as more effective (Purvanova & Bono, 2009); on the other hand, the assessment of competencies required for the modality and that may favor the evaluation of work is still a matter under debate (Sapién-Aguilar et al., 2016).

Some potentialities of virtual work are represented by cultural comprehensiveness and potential for innovation and skills development, with the performance of people from all over the world; lower travel costs; and reacting more quickly to social and market demands (Siebdraht, Hoegl, & Ernst, 2009; Townsend, DeMarie, & Hendrickson, 1998). With this understanding, companies that adopt home office can expand their ability to react to market challenges, which can be favorable in the context of broad competition and crisis (Sapién-Aguilar et al., 2016).

With the increasing possibility of remote work in many different areas, the importance of identifying how workers can better develop their functions in this new scenario is also growing (Krumm et al., 2016; Maduka et al., 2018). In this sense, telecommuting requires different skills compared to face-to-face work (Van Wart et al., 2019). On the other hand, skills important in remote work may also be required by face-to-face work. Thus, research on the topic has sought to identify the competencies that are most relevant in the telework context (Krumm et al., 2016). Among the challenges of virtual work:

effective virtual collaboration, efficient workflows, proper performance monitoring, maintaining team spirit as well as trust (Hertel, Konradt, & Orlikowski, 2004; Ebrahim, Ahmed, & Taha, 2009).

Certain specific skills could be related to the greater likelihood of a professional becoming a remote worker and being more successful in that position than as a traditional worker (Pigini & Staffolani, 2019). On the other hand, people with greater supervision or socialization needs would not be able to do as well in remote work as in face-to-face work (Charalampous et al., 2018).

When it comes to work in non-face-to-face contexts, the skills to use new forms of technology, as well as identifying the most appropriate media for fluid communication within the work team, have proven indispensable for achieving the intended goals (Velez-Calle et al., 2020).

In remote work the different members of the work team are dispersed. This makes the nature of the communicative process unique and demands the need to build an environment in which trust prevails, a factor considered indispensable for the good performance of virtual teams (Flavian, Guinalíu & Jordan, 2019; Tijunaitis, Jeske & Shultz, 2019; Tan et al., 2019; Lembrechtsab, Zanoniac & Verbruggen, 2018; Norman et al., 2020).

In this sense, the effective use of technology-mediated communication, as well as the contextualization to the virtual environment of relational skills, have been highlighted as desirable competencies for teleworkers (Gupta & Pathak, 2018; Norman et al., 2020; Holtz et al, 2020; Hart, 2016). In this sense, Iulia and Dumitru (2017) present in their review on competencies for virtual work the role of the leader is fundamental, whereas it will be necessary to strengthen the strategic alignment, as well as to share the vision of the project in an assertive way.

3 Methodology

From the perspective of conducting a systematic review, which allows the analysis and synthesis of the knowledge already built; the identification of gaps and the glimpse of new research possibilities (Botelho, Cunha & Macedo, 2011), to better understand the theme remote work competencies following the parameters of Sampaio & Mancini (2007) regarding the (i) Definition of the study objective, (ii) investigation of the evidence, carried out through the selection of literature search strategies, with delimitation of descriptors that would be used and definition of the databases for consultation; (iii) review and selection of studies, stipulating the criteria for inclusion and delimiting the information to be extracted; (iv) analysis of the studies identified; and (v) presentation of the results, with interpretation and discussion pertinent to the review topic.

To this end, we chose to present a survey of scientific production in two stages: (I) bibliographic survey in the web of Science (WoS) database, with the use of the keywords (descriptors) “work virtual” and “competencies” in English and in Portuguese, with the definition of the search field “any” and the boolean operator “and”; and (II) selection of articles, selected between the years 2016 and 2020 and selection after reading the abstracts, based on the criterion of adherence to the research theme, and further appreciation and presentation of the studies.

(I) Bibliographic survey: data imported from the query performed to the search base available on line, Web of Science, using the query strings “work virtual” and “competencies” in Web of Science, with

a temporal filter from 1945 to 2020, with a result of 252 valid titles (in Open Access). The data were imported into VOSviewer software, which maps the literature review document and lists the terms that relate to each other with the highest semantic frequency (Waltman, Van Eck & Noyons, 2010).

As an output of the software one can obtain a visualization organized in clusters by color from the recurrence of keywords, based on coauthorship, keywords and co-occurrence, citation, coupling bibliography or co-citation (Van Eck & Waltman, 2018). Among the analysis criteria are: (i) circles are used for the location of an item; (ii) items are grouped into clusters; (iii). Cluster colors identify groups of items; and (iv). Distances on the map reflect the similarity or relationship between items.

The criterion used for grouping the terms was that of co-occurrence, which is characterized as "the simultaneous presence of two or more record units in a context unit. The measure of co-occurrence (contingency analysis) accounts for the distribution of elements and their association" (Bardin, 2010, p. 140). With this criterion and, in analysis of the research objective, we chose to extract the bibliometric map associated with keywords and co-occurrence, based on the graphic presentation of the main keywords on a theme present in the literature, highlighting connections and possible underlying theoretical relationships (Van Eck & Waltman, 2018). To create the co-occurrence map were combined in the software (type of analyses-coccurrence), minimum number of keyword occurrence (unit of analysies-all keywords) equal to 2 and counting method (full couting).

(II) Article selection: Based on the text selection, sixteen articles were included in the final sample of this systematic review. Information extracted from each article was entered into an Excel spreadsheet, containing: date of survey, database, journal/magazine, language, descriptors used, year, title, authors, organizational affiliation of the authors, abstract, keywords, study objectives, methodology, findings/results, contributions, suggestions for future research, competencies pointed out by the study for work in non-face-to-face contexts.

Finally, we compiled the competencies for remote work present in each of the studies, which were then synthesized into seven categories of competencies: managerial, communicative, technical, social, technological, behavioral and analytical. As a result of the analysis of the competencies presented, the article advances in theoretical design about competencies for remote work, based on the systematic review.

4 Results

In WoS were totaled 125 keywords with a minimum requirement of 2 occurrences to integrate the analysis, this filtering resulted in 4 connected clusters, with nodes calculated according to their total link strength, which represent the density expressed and the degree of correlation between the terms. Thus, 10 words form the clusters separated by colors for better graphical visualization, as shown in Chart 1.

Chart 1 - Keywords extracted by VOSviewer

***Keywords* selecionadas**	***Occurrence***	***Link strength***
Problem-based learning	2	2
Team work	2	2

Collaborative work	2	1
Employability	2	1
Future work skills	2	1
Intercultural	2	1
Core competencies	2	0
Distributed work	2	0
Virtual campus	2	0
Virtual teams	2	0

Source: data extracted from VOSviewer software output

Note: "Occurrence" involves the number of times the word appears in the selected articles.

"Link strength" represents the number of the keyword links with other words.

Considering Table 1, it is observed that, of the 10 words that met the defined selection criteria (minimum of 2 occurrences), the words "Problem-based learning" and "Team work" present the number of 2 "link strength", and, the words "Collaborative work", "Employability", "Future work skills", "Intercultural" present the number of 1 "link strength", and, finally, the words "Core competencies", "Distributed work", "Virtual campus" and "Virtual teams", although with the minimum of 2 occurrences, have no "link strength".

To give visibility to the 4 connected cores, Figure 1 shows the links (edges), with the most frequent words (larger nodes) and the words that appear together more frequently (sparser edges). The graph points out the most relevant terms and their connections with each cluster of nodes.

Figure 1 - Clusters of the most recurrent keywords among 125 keywords with most relevant links

Source: data extracted from VOSviewer software output

Based on Figure 1, it is observed that the four most frequent words in the volume of 252 articles that were imported into the VOSviewer software were "Collaborative work", "Problem-based learning", "Team work", and "Intercultural." Of these words, in the temporal perspective, the keyword "Team work" presents itself in the studies at a more recent date, in this case 2016.

Regarding stage II, of the sixteen articles that make up this systematic review (Table 1), four are literature review studies (Table 2) and eight empirical studies (Table 3). They were published in English (6), Portuguese (6), and Spanish (4). There are seven articles from Brazil, four from Latin America (Mexico and Costa Rica), four from Europe (Germany, Romania and the United Kingdom) and one from

the United States. As for the methodological profile of the twelve empirical articles, six of them use the qualitative approach, four the quantitative, and two make use of both.

Table 1 Literature Review Studies: Skills for Remote Working

Authors/Year of Publication	Review Studies Professional	Category Required	Competencies Identified
Mattar et.al (2020)	Empirical studies written in Portuguese language.	On-line tutors of undergraduate courses.	Managerial, Disciplinary knowledge, Pedagogical knowledge, Communication skills, Socio-affective skills, Technological skills
Iulia & Dumitru (2017)	Studies about leadership in international projects in a virtual environment	International Project Managers in virtual work environment	Technological skills Organization, Value chain, Technological skills, Cultural intelligence, Sustainability and Ethics
Schulze & Krumm (2017)	Studies on competency requirements for working in virtual teams, virtuality challenges and specific competencies for these challenges.	Virtual team workers	Media Skills, Communication, Relationships of Trust, Intercultural Competence, Self-Management, Conflict Management
Cassundé, Mendonça & Barbosa (2017)	Studies dealing with teachers' e-skills for teaching in Distance Education and the influence of institutional conditions on the development of these skills	Distance Learning (DL) professors of higher education courses	Specific content competencies, Methodological competencies Evaluative competences, Social and communicative competences Personal competences

Fonte: dados da pesquisa

Table 2 - Empirical Studies: Skills for Remote Working

Authors/Year of Publication	Type of Research	Sample	Professional Category whose competencies are studied	Competencies Identified for the Job

Luna Serrano & Hernández Villafaña (2020)	Quantitative	2281 distance learning university students and 06 experts in the field	Distance learning higher education professors	**Planning the Teaching and Learning Process** Plan focus, course of subject matter, and learning experiences Demonstrate broad mastery of ICT use and selection relevant to the teaching-learning process Use appropriate forms of communication and evaluation of the teaching-learning process	**Conducting and Assessing the Teaching and Learning Process** Managing learner progression Plan learning experiences Implement guided didactic interaction to increase motivation and expectations of results Use appropriate forms of communication Use appropriate forms of evaluation of the teaching-learning process
Pereira & Freitas (2019)	Quantitative	114 project managers Project	Managers	Good communication; Commitment; Cooperative and collaborative attitude; Self management, Organization; Know and apply well the concepts of project management; Adapt easily to the use of communication and information technologies; Maintain good working relationships; Have multicultural sensitivity to interact with a diversity of people; Proactivity, Have maturity (experience) in project management; Leadership profile; Flexibility; Knowledge of business and market related to the project; Knowledge of technology needed for the project	
Van Wart *et al*. (2019)	Qualitative	222 university teachers, 209	Teachers using online	Virtual communication, Virtual social skills, Virtual team building skills,	

		educational managers and 341 university students	teaching tools	Change management, Technological skills, Reliability	
Andrés Jimenéz & Alfaro Azofeifa (2018)	Qualitative	03 distance education university professors and 02 experts in the field	Distance education professors	Promotion of participation, Correct use of the virtual platform, Timely response to questions, Mediation in the content of forums, Promotion of socialization spaces, Promotion of discussion spaces, Promotion of criticality, Incorporation of new technologies and innovative resources, Indication of quality didactic material, Content organization, Design of assessment activities, Design of assessment instruments	
Coelho, Faiad & Rêgo (2018)	Qualitative and Quantitative	209 distance learning support professionals	Administrative and pedagogical support secretaries for distance learning courses courses	**Technical Skills** Provide information requested quickly and promptly; Knowledge of activities and routines; Use of Internet tools; Ability to analyze incoming documentation; Write emails clearly and objectively, conveying what you want to the recipient, avoiding noise or communication failures.	**Behavioral Competencies** Assertiveness; Objectivity; Patience; Versatility; Creativity and Innovation; Quick thinking; Flexibility; Initiative; Good interpersonal relationship. Promptness in meeting different demands; Good sense; Dynamism.

García-Cabrero *et al.* (2018)	Qualitative	28 distance education teachers and 05 specialists in the area	Distance education teachers	**Planning the Teaching and Learning Process** Plan focus, course of matter, and learning experiences; Demonstrate broad mastery of ICT use and selection relevant to the teaching learning process; Define criteria and activities for course assessment and accreditation.	**Conducting the Teaching and Learning Process** Managing learner progression Plan learning experiences Implement guided didactic interaction to increase motivation and outcome expectations. Use appropriate forms of communication. Evaluating the impact of the Teaching-Learning process Use appropriate forms of evaluation of the teaching-learning process
Maduka *et al*. (2018)	Qualitative and Quantitative	14 members of two virtual teams in a multinational company	14 membros de duas equipas virtuais numa empresa multinacional	Effective communication, Ability to provide constant feedback, Ability to manage multicultural team, Ability to build trust, Purpose driven, Reliability, Transformation style, Ability to coordinate and monitor, Good decision making skills, Ability to meet short term goals, Ability to resolve conflicts	
Almeida & Santos (2017)	Qualitative	Documents from a HEI with distance tutoring attributions/functions and post-graduate tutors/managers from the HEI	Distance learning post-graduate tutors	Pedagogical/Technical, Socio-affective, Managerial, Technological	

Meirelles et.al (2017)	Qualitative	06 distance learning professionals	Corporate e-learning and distance learning professionals in Higher Education	Computer literacy, Knowledge of routines and procedures for using the virtual platform, Knowledge sharing, Analysis and problem solving, Orderly execution of tasks, Acceptance of the new, Search for new knowledge, Collaboration with co-workers Interest in learning new technologies.	
Beraldo & Maciel (2016)	Qualitative	04 teachers from a public high school	Teachers using a distance learning platform.	Self-teaching, Motivation, Making a difference, Constructing the new, Co-Constructing with the group	
Krumm *et al.* (2016)	Quantitative	438 professionals with experience working in virtual or traditional teams	Workers in virtual teams	**Leading and Deciding** Make clear decisions; Take responsibility; Motivate other team members; Act on your own initiative; Work autonomously; Set clear goals for another team member	**Analyzing and Interpreting** Use the media effectively; Communicate, in writing, in an understandable and structured way; Work in a solution-oriented way; Analyze data effectively; Effectively learn to use new technologies; Gain an understanding of others' tasks; Work effectively with computers and digital media; Show analytical skills.

Sapién-Aguilar et.al (2016)	Quantitative	Information Technology workers and remote workers from large companies from 32 large companies	Information Technology workers and remote workers from large companies	Digital Competence: Technological Mastery, Multimedia Mastery, Information Skills, Communication Skills

Fonte: dados da pesquisa

5 Discussion

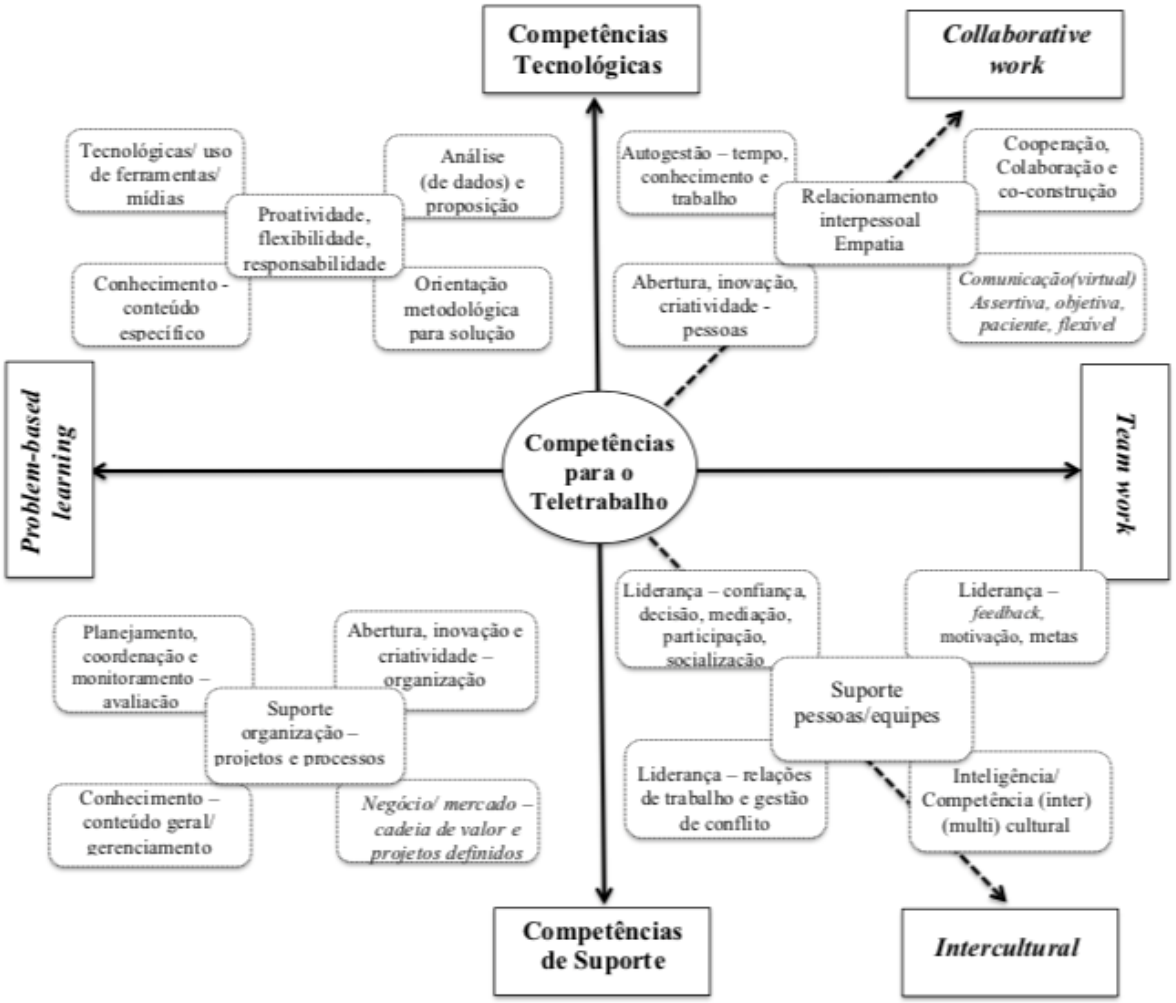
The bibliometric map showed the presence of 10 keywords with a minimum of 2 occurrences in the 252 articles selected (Chart 1). Associated with the description of the words, we observe the results detailed in Tables 1 and 2, in reference to the competencies evidenced based on recurrence. With these results, we resort to connections between concepts in the development of an argument for the theoretical design about competencies for remote work.

For a generic understanding about Competencies for Telework, it was supported by the concept presented by Messenger (2019), which involves knowledge and skills to perform work activities remotely, with the intermediation of information and communication technologies. With this, Gramigna's (2007) delimitation of the separation between technical and support competencies (which sustain the technical ones) is observed, for a didactic path to build a network of relations around the intended theoretical design.

Based on Figure 1, it is observed that the four most frequent words in the volume of 252 articles that were imported into the VOSviewer software, were “Collaborative work”, “Problem-based learning”, “Team work” and Intercultural. Of these words, in the temporal perspective, the keyword “Team work” presents itself in the studies at a more recent date, in this case 2016.

With the object of research, “competencies for telework” Figure 2 gathers the most relevant keywords, Problem-based learning, Team work and Collaborative work and Intercultural are presented in reference to technical competencies and those of support in the form of a table. In four quadrants, the competencies were inserted considering the following criteria: compilation and convergence of competencies, analysis of these based on the definition of the quadrants.

Figure 2 - Theoretical design on skills for remote work



Source: prepared by the authors, based on survey data and word drawing.

To advance in the understanding of Figure 2, which proposes a theoretical design on competencies for remote work, we resume the idea that the new coronavirus (SARS-CoV-2) has demanded from researchers the exercise of analysis and proposition in view of the urgency that the health crisis and, consequently, social and economic crisis has generated in the world. Crisis, in this study, is understood as one or more events that threaten the health, safety and welfare of people in a community, and may be represented by armed conflicts, environmental disasters, epidemics or pandemics (Who, 2007).

As a major crisis, the pandemic has raised a specific look to work, in its possibilities, which, in configuration of compulsory confinement to minimize the contagion, the lockdown, the experience with Telework, virtual work or telework has become mandatory.

While the experience with virtual work in developed and developing countries is differentiated (Sapién-Aguilar et al. 2016), and the differences accentuated with the context of the pandemic (Silveira et al., 2020), it becomes even more urgent to substantiate parameters contextualized to the Latin American reality so that the labor situation arising from the crisis can be conducted in the face of potentialities. Without previous preparation (competencies), triggered by the instability and vulnerability of

organizations, the social and economic situation of developing countries may worsen in the course of the pandemic.

Around the design, quadrant I is defined, which relates the word "Problem-based learning", to technological competencies. In this field were gathered selected competencies from the systematic review that facilitate problem solving with emphasis on the operationalization of technologies needed for virtual work. They are represented by technological competences for the use of tools, software, and media; mastery of specific content for virtual work, and the ability to analyze problems and data in the construction of proposals supported by methodological guidelines aimed at problem solving. At the center of the competencies were situated competencies that underlie the operationalization of technologies, in this case proactivity, flexibility and responsibility. To facilitate didactic understanding of the quadrant, the following is defined: Technical-operational competencies for teleworking.

Of great relevance, technological skills are one of the pillars of remote work. In this sense, the knowledge of the technologies that should be employed in the execution of the work, as well as the ability to properly deal with them are essential skills in this scenario of virtuality (Krumm et al., 2016; Maduka et al., 2018; Sapién-Aguilar et.al, 2016; Schulze & Krumm, 2017; Van Wart et al., 2019). Due to the rapid advancement of tools and platforms used in telecommuting as much as their variability, the willingness and ease of adopting new technologies are also important skills to be developed by remote workers (Andrés Jimenéz & Alfaro Azofeifa, 2018; Krumm et al., 2016). For problem solving, analytical skills encompass the ability to analyze and solve problems. They also enable a global understanding of the work and tasks of others, which in the context of physical distance between co-workers proves indispensable (Meirelles et.al, 2017; Krumm et al., 2016).

Regarding quadrant II, there is the relationship between technological competencies and “collaborative work” and “team work”. Behavioral competencies (of people in work situation) capable of facilitating teamwork in the virtual environment were gathered. On one side of the review were gathered competencies related to autonomy and innovation: self-management of time, of the learning process and of the work itself; individual openness to innovation, with expression of creativity; cooperation, collaboration and co-construction; and assertive, objective, patient and flexible virtual communication. At the center of the quadrant is the relational competence, in the sense of building empathy as a facilitator of virtual work. The set of these competencies is defined as: Technical-relational competencies for telework.

To elucidate quadrant II, we observe a wide range of behavioral competencies defined as relevant in non-face-to-face work contexts. Attitudes such as commitment, flexibility, objectivity and openness to innovation are listed as desirable in remote work (Pereira & Freitas, 2019; Coelho, Faiad & Rêgo, 2018; Meirelles et.al, 2017; Beraldo & Maciel, 2016).

In the category of communicative skills the proper use of virtual forms of communication in order to respond to demands in a timely manner is of great importance. It is necessary to understand which communication tool is most suitable for each situation (Schulze & Krumm, 2017; Van Wart et al., 2019). As teleworkers do not have face-to-face interaction available in many situations, written communication gains prominence and must be well executed in order to avoid misinterpretations (Krumm et al., 2016). For being physically distant from coworkers the concern with feedback within the team should be greater (Maduka et al., 2018).

For quadrant III, which places understanding around the word "Problem-based learning", with the support competencies, the following were gathered: general knowledge that facilitates organizational management for the work; capacity to plan, coordinate, and monitor the work, with emphasis on assessment tools for virtual work; focus on the business, with emphasis on the value chain and market analysis that mobilize the definition of projects; and collective openness for innovation, with expression of creativity. At the center of the set of competencies of this space is the idea of organizational support for projects and processes that configure the virtual work. This quadrant receives the following definition: organizational-managerial competences of support for teleworking.

The competencies of the managerial category gather skills related to the organization and planning of the work, as well as its conduction to achieve the results, in addition to the ability to make decisions. Due to the characteristics of the virtual work environment, self-management skills stand out in this category, which include attitudes such as initiative, responsibility, and autonomy (Krumm et al., 2016; Schulze & Krumm, 2017).

Finally, quadrant IV, involves support skills and the words "collaborative work" and "team work". The competencies focused on leadership are gathered: working relationships and conflict management; trust, with the mobilization of mediation, participation and socialization, and decision making; goal setting, and the motivation and favorable feedbacks; and cultural (inter/multi) intelligences/skills. Support for people and teams represents the mediation of this quadrant. Thus, it is defined: Organizational competencies of the leadership in supporting telework.

Studies that support quadrant IV show the centrality of leadership for the development of work in a virtual context. The performance of remote leadership on virtual work teams and the competencies that these managers should develop for this specific type of leadership, called e-leadership, for example, are investigated in two of the empirical studies (Pereira & Freitas, 2019; Maduka et al., 2018) and one literature review (Iulia & Dumitru, 2017).

When it comes to remote work, social type skills also receive great attention. For leaders, they are important so that an environment of trust is created, good interaction is maintained, and adequate conflict management is maintained among work team members who are physically distant, encouraging attitudes of cooperation and collaboration. With regard to culture, telecommuting can amplify diversity in organizations, even including people from different cultures in the same work team, the competence of sensitivity to deal with this multiplicity has been highlighted in studies (Iulia & Dumitru, 2017; Maduka et al., 2018; Schulze & Krumm, 2017).

It is important to note that, when it comes to remote work, skills linked to leadership and decision-making aspects are considered essential for professionals working in this modality. Krumm et al (2016), for example, found in the comparative research they conducted between virtual and traditional teams that competencies related to leadership and decision-making (which involve aspects of autonomy, decision-making, and self-management), as well as analysis and interpretation (which involve using technologies effectively to communicate and understand the information received), were more relevant competencies for virtual teams compared to traditional teams.

From the design (Figure 2), and the conception present in the quadrants, it is defined that the list of competencies defined around the (I) Technical-operational skills for telework, (II) Technical-relational

skills for telework, (III) Organizational-managerial skills of support for telework, (IV) Organizational skills of leadership in support for telework, represents a theoretical guide for the development of policies and practices aimed at telework, contributing to the context of great crisis that has demanded from organizations, managers, leaders, teams and workers solutions that equate the use of technologies with individual and collective performance and well-being, being part of urgent propositions, as Costa et al. (2020), Silveira et al, (2020) and Breuner et al., (2020).

6 Conclusion and Final Considerations

With the objective of defining competencies for telework through a systematic review of the literature, the research presents the definition through a theoretical design (Figure 2), composed of four quadrants that combine the separation of technical and support competencies with the words "Collaborative work", "Problem-based learning", "Team work" and Interculture.

As a result, the definitions of the competencies for telework are gathered around four macro-competencies, which situate knowledge, skills, attitudes, and values needed in the virtual context. They are (I) Technical-operational competencies for telework, (II) Technical-relational competencies for telework, (III) Organizational-managerial competencies of support for telework, (IV) Organizational competencies of leadership in support of telework.

In the way of the great crisis, it is understood that the results bring together themes present in varied studies on the subject of "competencies", being the acceleration of the use of technologies and digitalization in a context of crisis that presents itself in the present and in analysis about the future (Silveira etl al., 2020), an issue of greater emphasis. While the experience around remote work is differentiated across countries (Sapién-Aguilar et al. 2016; Silveira et al., 2020), the challenge of remote work in the face of the great crisis may also be greater for developing countries.

Crises make people fragile, and the pandemic situation provides managers, leaders, organizations, workers, society with a specific analysis focused on the ability to overcome (in terms of emotional balance) that comes before the urgency of developing "new" skills. With this, it is argued, in conclusion, that the research presents a theoretical design in favor of essential skills so that telework can be a favorable experience to performance and well-being, but attention needs to be given to the mental health of the people involved. Without this, there is no way to advance in competencies.

On the other hand, values are delineated in the theoretical design, in relation to openness to innovation and expression of creativity, at individual and collective levels. These values of openness are particularly important for the movement towards change demanded by the current major crisis. With this, a second observation is made: the stimulus for innovation, at the individual and collective levels, in the formative, evaluative, and cultural fields.

With these arguments, the proposition is anchored by the urgency of the debate and construction of paths favorable to the development of competencies for telework. Throughout the quadrants, various possibilities of theoretical referencing float, while the course of its construction places a systematic review that addresses "themes" on the one hand and "competencies" on the other. A theoretical deepening of the design, therefore, is a suggestion for future studies.

In order to advance in future studies, we also suggest analyses that particularize the challenges for the development of competencies for teleworking (or the configuration of this modality of work) in relation to mental health in the face of the great crisis, as well as values of openness around innovation and expression of creativity. Considering that the pandemic is still a present theme, with a not yet encouraging scenario about its overcoming, the suggestions reinforce the need for other understandings and propositions that can give light to dark days, months and years for people, managers, leaders, organizations and society.

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