



LOCAL BUZZ, GLOBAL PIPELINE AND GLOBAL BUZZ: LOCAL AND GLOBAL INTERACTIONS IN COMPANIES IN THE IT SECTOR

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Abstract

Objective: Examine the effects of *local Buzz*, *Global Pipeline* and *Global Buzz* on the creation of knowledge and learning, and of these in the organizational innovation of agglomerated companies.

Methodology: A quantitative approach was adopted, using the structural equation modeling technique, in which a questionnaire with 43 items was applied, organized on a seven-point Likert scale.

Originality / Relevancy: The literature on Buzz and Pipeline shows that the interaction of the agglomerated provides bidirectional knowledge exchanges that can influence both the interorganizational environment of the agglomerated and the organizational environment of agglomerated companies.

Main results: The results revealed that the more relationships develop in the local environment, the more companies can learn. The Global Pipeline provides better levels of information exchange for external communication channels. Global Buzz has the potential to subsidize local and global relations in APL.

Theoretical/methodological contributions: Among the main contributions of this study include: a) the definition of a conceptual model that deals with the influence of interorganizational relations at the organizational level of agglomerated companies; b) the empirical measurement of *local Buzz* and *Global Pipeline* construts; and c) The buz place is critical to accessing management information.

Social contributions / for management: This study allows companies to know and improve their local and global relationships. This study contributes to public and private actors responsible for the execution of development actions for the sector, assisting them in possible plans for improvement and local development.

Keywords: *Buzz*. *Global Pipeline*. *Global Buzz*. Structural equations modeling.

Cite as / Como citar

American Psychological Association (APA)

Silva, C. C., & Zanquetto Filho, H. (2023). Local buzz, global pipeline and global buzz: local and global interactions in companies in the IT sector. *Iberoamerican Journal of Strategic Management (IJSM)*, 22(1), 1-35, e24230. <https://doi.org/10.5585/2023.24230>

(ABNT – NBR 6023/2018)

SILVA, C. C. da; ZANQUETO FILHO, H.. Local buzz, global pipeline and global buzz: local and global interactions in companies in the IT sector. *Iberoamerican Journal of Strategic Management (IJSM)*, v. 22, n. 1, p. 1-35, e24230, 2023. <https://doi.org/10.5585/2023.24230>

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LOCAL BUZZ, GLOBAL PIPELINE E GLOBAL BUZZ: INTERAÇÕES LOCAIS E GLOBAIS EM EMPRESAS DO SETOR DE TI

Resumo

Objetivo: Examinar os efeitos do *local buzz*, *global pipeline* e *global buzz* sobre a criação de conhecimento e aprendizado, e destes na inovação organizacional de empresas aglomeradas.

Metodologia: Adotou-se a abordagem quantitativa, com a utilização da técnica de Modelagem de Equações Estruturais, nos quais aplicou-se um questionário com 43 itens, organizados em escala do tipo Likert de sete pontos.

Originalidade/Relevância: A literatura sobre *buzz* e *pipeline* mostra que a interação de aglomerações de empresas proporciona trocas de conhecimento bidirecional que podem influenciar tanto no ambiente interorganizacional quanto no ambiente organizacional das empresas aglomeradas.

Principais resultados: Os resultados revelaram que quanto mais às relações se desenvolvem no ambiente local, mais as empresas conseguem aprender. O *global pipeline* proporciona melhores níveis de troca de informações pelos canais de comunicação externo. O *global buzz* tem o potencial de subsidiar as relações locais e globais no APL.

Contribuições teóricas/metodológicas: Dentre as principais contribuições deste estudo destacam-se: a) a definição de um modelo conceitual que trata sobre a influência das relações inteorganizacionais no nível organizacional de empresas aglomeradas; b) a mensuração empírica dos construtos *local buzz* e *global pipeline*; e c) o *local buzz* é fundamental para ter acesso a informações gerenciais.

Contribuições sociais / para a gestão: Este estudo permite que empresas conheçam e aprimorem suas relações locais e globais. Este estudo contribui com os atores de natureza pública e privada responsáveis pela execução de ações de desenvolvimento para o setor, auxiliando-os em possíveis planos de melhoria e no desenvolvimento local.

Palavras-chave: *Local Buzz*. *Global Pipeline*. *Global Buzz*. Modelagem de Equações Estruturais.

LOCAL BUZZ, GLOBAL PIPELINE Y GLOBAL BUZZ: INTERACCIONES LOCALES Y GLOBALES EN EMPRESAS DE TI

Resumen

Objetivo: Examine los efectos del zumbido local, la tubería global y el zumbido global en la creación de conocimiento y aprendizaje, y de estos en la innovación organizacional de las empresas agrupadas.

Metodología: Se adoptó un enfoque cuantitativo, utilizando la técnica de Modelado de Ecuaciones Estructurales, en el que se aplicó un cuestionario con 43 ítems, organizados en una escala Likert de siete puntos.

Originalidad / Relevancia: La literatura sobre el zumbido y la tubería muestra que la interacción del clúster proporciona intercambios de conocimiento bidireccionales que pueden influir en el entorno interorganizacional del clúster y el entorno organizacional de las empresas aglomeradas.

Principales resultados: Los resultados revelaron que cuantas más relaciones se desarrollen en el entorno local, más empresas pueden aprender. La tubería global proporciona mejores niveles de intercambio de información para canales de comunicación externos. Global Buzz tiene el potencial de subsidiar las relaciones locales y globales en APL.

Contribuciones teóricas / metodológicas: Entre las principales contribuciones de este estudio incluyen: a) la definición de un modelo conceptual que se ocupa de la influencia de las relaciones interorganizacionales a nivel organizacional de empresas aglomeradas; b) la medición empírica del zumbido local y las construcciones de tuberías globales; y c) El lugar BUZ es fundamental para acceder a la información de gestión.

Contribuciones sociales / a la gestión: Este estudio contribuye a los actores públicos y privados responsables de la ejecución de acciones de desarrollo para el sector, ayudándoles en posibles planes de mejora y desarrollo local.

Palabras clave: Zumbido. Tubería global. Buzz global. Modelado de ecuaciones estructurales.

1 INTRODUCTION

The economic activity clustered provides and facilitates transactions between the actors of a clustering, benefiting companies ((Marshall, 1985; Schmitz, 1997; Bathelt; Golfetto & Rinallo, 2014; Gibson & Bathelt, 2015), in addition to promoting the economic and social development at local and regional levels (Bathelt & Cohendet, 2014; Bathelt & Zeng, 2015; Fitjar & Rodriguez-Pose, 2015). This increase is explained in great part by the presence of qualified labor, by the formation of a specialized suppliers network and by the interdependencies and *linkages* in the local environment that causes derived advantages of the knowledge *spillovers* (Marshall, 1985; Schmitz, 1997; Porter, 1998).

In this context, it highlights studies that seek to understand the spatial dynamics of clustering of companies (Bathelt; Malmberg & Maskell, 2004; Bathelt & Schuldt, 2010; Scholl; Garas & Schweitzer, 2018; Li & Bathelt, 2017), through knowledge global trades, comprehended as the result of interactive process, in which the actors which has different kinds of knowledge and skills get together and exchange informations with the objective of obtain competitive advantages (Lin, 2018; Zhu; Chen & Lian, 2018; Bathelt & Li, 2020). These studies points that the flow of knowledge it is not delimited to the local level and it is increasingly processed, through global networks through communication channels originating from the external environment of the clustered (Li & Bathelt, 2017; Lin, 2018; Zhu *et al.*, 2018; Bathelt; Li, 2020).

In this context, the *local buzz* characterizes itself by spontaneous information and continuous updates of informations in local level, in which are essentials to the creation and proliferation of knowledge, as well as learning process and innovative activities (Bathelt *et al.*, 2004; Bathelt & Zhao, 2016). This phenomenon facilitates the socialization, has an efficient communication, helps to solve problems and provides motivation between the actors of a clustering. (Storper & Venables, 2004; Bathelt *et al.*, 2004; Bathelt & Turi, 2011; Bathelt & Gibson, 2015). In the global level, highlights the *global pipeline*, on the other hand, it is also a characteristic phenomenon of clusterings from permanent companies, in which the clustering, with the aid of communication channels, it is able to maintain strong and competitive offering particular advantages, such as knowledge, learning and innovation for actors in such environment. (Malmberg & Maskell, 2006; Alcácer; Cantwell & Pistello, 2016; Bathelt & Li, 2020).

Moreover, you can see also in the temporary clusterings, the phenomenon of *global buzz*, that refers to a specific dynamic that is characterized by peculiar patterns of information

and communication, as the result of the physical co-presence of diverse actors (entrepreneurs, company representatives, scientists, specific professionals, exhibitors, visitors, experts and observers) from all over the world (Zhu *et al.*, 2018). This phenomenon happens in international trade fairs, seminars, *coffee breaks*, lectures, etc has an institutional specific environment, characteristic of the limited timeframe, because starts and finishes with scheduled dates, presence of global actors, intensive face – to-face interaction, different possibilities of observation, meetings, and diverse relationships (Bathelt & Schuldt, 2010). Therefore, international trade fairs and conferences, for instance, allows that the companies bind themselves to non-local groups of knowledge, have access to new ideas and identifies potential partners. (Bathelt, 2017; Bathelt; Gibson, 2015; Bathelt; Henn, 2014; Rinallo *et al.*, 2017).

The capacity of combine knowledge originated from the interactions between actors of the global and local environment is presented in the literature as a motor essential of competitive differentiation for clustering of companies (Bathelt; Malmberg; Maskell, 2004). Thus, among the different existing denominations for a business clustering, such as Local Productive Arrangements (Sebrae, 2005; Redesist, 2005), Local Productive and Innovative Arrangements (Cassiolato; Lastres, 2005), Industrial Districts (Marshall, 1985), Cluster (Porter, 1998), Local Productive and Innovative Systems (Suzigan; Garcia; Furtado, 2007), etc. This study approaches the term Local Productive Arrangements (LPA), that characterizes as a set of companies of similar economical or complementary activities, in which they get together in order to provide environments conducive to the development of their activities (Cassiolato; Lastres, 2003).

About the lack of this work aims to fill, we can notice that at the heart of the model of *buzz* and *pipelines* by Bathelt *et al* (2004) is the affirmation that the local and global interaction with different actors influences the interorganizational environment of clustered companies through knowledge, learning and innovation. The *local buzz* brings local information and agencies the sharing of knowledge, generating a “hustle”; the *global pipeline* agencies external communication channels that “introduces” new information and knowledge to the clustering of the company; and the *global buzz*, allows that the interorganizational environment of a temporary clustering remains “vibrant” through the interaction and actions trade, transfers and sharing of knowledge, providing the rising of innovative ideas. Beyond the acquiring of information, knowledge, learning and interorganizational innovation in the agglomeration of companies, this study casts a glance at the effects of the *buzz* and *pipeline* in the organizational environment of clustered companies, specially LPA.

Thus, considering this theoretical fill of investigation, it was elaborated the following research problem: Which was the effect of the *local buzz*, *the global pipeline* and *the global buzz* in the creation of knowledge and in the learning and these in the innovation of companies that compose the LPA of software development from BH? We know that LPAs has potential to influence the corporate resources of clustered companies, however, the knowledge of how the companies are affected by the resources found in the local environment, and how it relates to its level of internal resources, it is still limited (Isaksen, 2003; Speldekamp; Knoblen & Saka-Helmhout, 2020). The interaction of clustering with external actors provides bidirectional exchange of knowledge that may influence both in the inter-organizational environment and in the organizational environment of the clustered companies (Mudambi, 2002). Therefore, such authors as Isaksen (2003) and Martin & Sunley (2003) highlights the importance of studying the organizational environment of clustered companies, as well as their learning process and innovation (Humphrey & Schmitz, 2002; Nelson, 1993).

Besides this introduction, this article found itself divided into other five sections. In the theoretical reference, it is about the nature of *local buzz*, *global pipeline* and *global buzz*, and how scholars understood the concept of creation of knowledge, learning and organizational innovation in the context of clustering of companies. In the third session it will be presented the methodological procedures, classifying the research and describing the techniques proposed for the gathering and treatment of the data as well as the research model and the construction of the hypothesis. In the fourth session it will be presented the results and discussion of the research. And finally, the study's conclusions, contributions and limitations will be outlined.

2. THEORETICAL REFERENCE

2.1 Local Buzz, global pipeline and global buzz

The geographical proximity is a differential for clustered companies. Through local interactions between actors, the creation, the dissemination and the exchange of information and knowledge become active, besides learning and consequently, innovation. Under this gaze, scholars emphasize that clustering of companies that presents actors that interacts in this determined environment now have a “vibrating” characteristic in the sense of advantages through interaction. This vibrating environment essential for the production of knowledge and learning located is called *buzz* (Storper & Venables, 2002; Bathelt; Malmberg & Maskell, 2004). This phenomenon happens in a frequent, informal, voluntary, relatively non-structured and in great part automatic (Bathelt *et al.*, 2004; Li & Bathelt, 2017).

The *local buzz* refers to the exchange of information, creation and proliferation of the knowledge originating from the face-to-face contact, the co-presence and the co- location of people and companies in the same sector, place or region (Mackinnon; Cumbers & Chapman, 2002). The term characterizes itself as a “buzz” composed by specific informations and continuous updates of this information, unexpected learning in the organized and accidental meeting, from which it happens, consequently the innovation (Gertler, 1995; Bathelt *et al.*, 2004). In this phenomenon, the information is widespread to other cluster companies allowing the absorption of knowledge (tacit/codified) through social relations of production (Bathelt *et al.*, 2004; Bathelt & Li, 2020). The *buzz* nature is spontaneous, fluid and happens in negotiations with local suppliers, conversations, *brainstorming*, deeper discussions, resolution of problems, in other words, participate in the “buzz” does not require specific investments (Bathelt *et al.*, 2004) . The buzz consists in specific informations and continuous updates of these informations, planned learning process and unforeseen events in organized and accidental meetings, mutual comprehension of new knowledges and technologies, as well as traditions and cultural habits particular from the technology, that stimulates the establishment of conventions and other institutional arrangements (Gertler, 1995). By the fact that they are inserted in this environment, the actors continuously contributes and benefits itself from the diffusion of informations, gossip and news (Bathelt *et al.*, 2004; Li & Bathelt, 2017; Bathelt & Li, 2020).

The *Local buzz* phenomenon is about exchanges that happen between the local actors of a clustering, in presential meetings, negotiations with local suppliers, conversations in cafes, conversations with other local actors, competitors, in *brainstorming*, in deeper discussions, presentations, etc. Such interactions are fruits of spontaneous interactions, does not require any specific investment by the local actors, it will introduce the trust between the actors, it will create technological *spillovers*, and it will provide the sharing of informations. (Aarstad; Kvitastein & Jakobsen, 2016; Bathelt *et al.*, 2004). In the *local buzz*, happens the development of values among the companies, which facilitates the interaction, the creation of knowledge and learning (Bathelt *et al.*, 2004).

However, the dynamic of knowledge creation and learning must not be reduced only to the internal interactions to clustering, but it builds also of its capacity to identify and access external sources of knowledge (Bresnahan; Gambardella & Saxenian, 2001). Considering recent researches, we can notice the importance of the communication channels for the creation of knowledge and learning among the companies, for instance, in Fitjar and Rodriguez-Pose (2015), by examine the region and international collaboration among companies; Bahlmann *et al.* (2009),by analyzing the *cluster* of New Medias from Amsterdam, and as it is showed by

Owen-Smith e Powell (2004) in their study about biotechnology companies in Boston (USA). In this area, it is understood that clustered companies may connect to the global economy through communication channels called *pipelines* (Maskell; Bathelt & Malmberg, 2006).

The term *pipeline* refers to the channels for the entrance of new knowledges about new markets and technologies (Bathelt *et al.*, 2004). In these channels, occurs the search, the development and the exchange of knowledge related to technologies, products and business (Rosenkopf; Nerkar, 2001). This phenomenon requires from the clustered companies' investments, as well as it needs planning and selection of the external strategical partners, skills to interact with different cultures and capacity of absorption (Barthelt *et al.*, 2004). Soon, we can characterize the *global pipeline* in a distinctive way of the *local buzz*, because the external channel of knowledge happens in an articulated way, non-voluntary and kinds of informations to be passed on to the companies are controlled by the external partner. Here, the interaction is influenced by the degree of trust existent in the local and global partnership (Bathelt *et al.*, 2004).

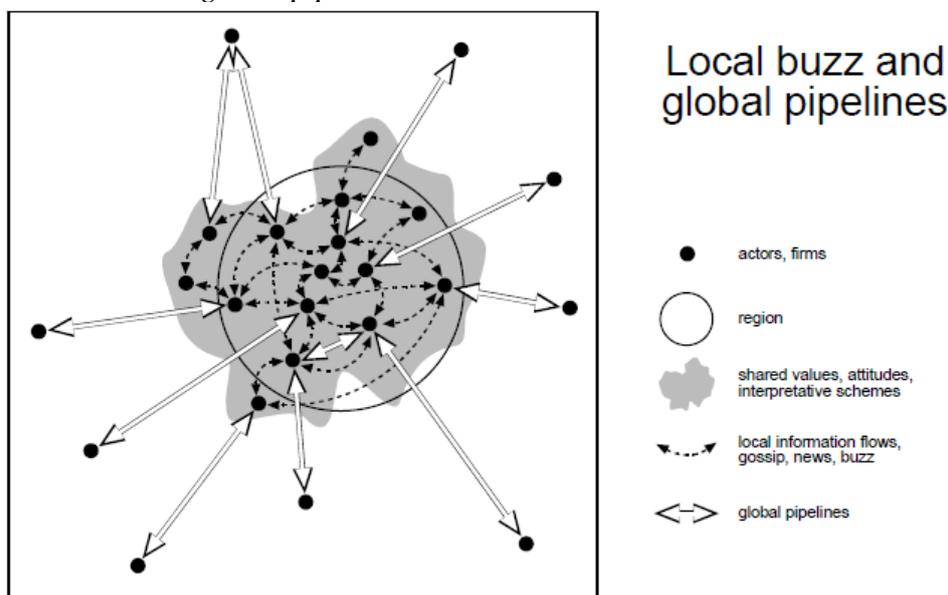
The *pipelines* generates flows of knowledge originated from connections and the LPAs, many times need other sources of knowledge to obtain competitive advantages. Once established, the external connections allows that clustered companies go beyond the local routines, which aids the innovation. The channels and mechanisms of external connections may take the form of strategical partnerships, practice communities, projects, participation in temporary events (international trade fairs), etc. (Bathelt *et al.*, 2004). According to Simmie (2003), in the United Kingdom, the innovative companies are concentrated in specific locations and has binds with international actors through international trade fairs. In the interpretation of the author, the non-local connections are crucial to the obtaining of knowledge, and consequently, to the innovation. The non-local connections may assume the form of strategical partnerships, practice communities (coworking), projects, participation in temporary events, seminars, lectures, etc, as well as the participation in online events. This phenomenon require from the clustered companies investments as well as it needs planning. (Bathelt *et al.*, 2004).

(Bathelt *et al.*, 2004) proposes a model clarifying that the efforts and skills to manage the local environment of a clustering of companies are different from the efforts to maximize the using of knowledge generated by the pipelines. The authors consider that, through global connections, the knowledge is created, stored, and used locally in a decisive way. The figure 1 also emphasizes that a clustering can not be restricted to its regional scale. Therefore, spaces of meaning and identity shared are established through continuous interactions among the clustering actors through time. The values, rules and other institutional resulting arrangements

may easily include actors located outside the region, which explains the connection made outside the circle in Figure 1. Besides, not all the actors and local companies are part of the clustering and share their values and interpretative schemes. The pipelines showed in the referred Figure has as objective to gain access to resources and knowledge non available locally, to complement the clustering, especially in the early stages of its formation and until hits the effect of a critical mass.

Figure 1

Local buzz and global pipeline



Source: Bathelt *et al.* (2004).

Besides the global and local interactions, the literature describes the phenomenon of *local buzz*, according to Bathelt e Schuldt (2010) may be characterized by specific patterns of information and communication in determined institutional environment, result of physical co-presence of diverse actors or agents of all over the world. The *global buzz* phenomenon may be comprehended as an exclusive ecology of exchange of information that is associated to the process of search in progress and depends on communication patterns reciprocal between the actors of an industry, technology or chain value (Borghini *et al.*, 2006; Bathelt & Schuldt, 2008b). Characteristic of temporary *clusters*, the informations, news, rumors, recommendations, and speculations traded in *global buzz* happens during a limited period from 3 to 5 days (Entwistle & Rocamora, 2006; Skov, 2006). The *global buzz* increases the possibility of learning of the actors exponentially during and after the fairs because he supports the

generation and the maintaining business networks over long distances (Borghini *et al.*, 2004; Maskell *et al.*, 2006; Power & Jansson, 2008).

Global buzz may be comprehended through relations that happens between the various actors that participate on temporary events in company clusterings (Bathelt; Li, 2020). In this scope, different actors, however, related, develop advantages through interactions, share knowledge and create innovative ideas in this environment (Bathelt & Schuldt, 2010; Borghini; Golfetto & Rinallo, 2006; Maskell; Bathelt & Malmberg, 2006; Zhu *et al.*, 2018). Due to its particularities, the *global buzz* has the potential to foster the presentation of ideas, the exchange of informations and the communication in temporary spaces (temporary *clusters*) (Zhu *et al.*, 2018). The co-location of many actors, along with an effective interaction may open to the possibility of future interactions, whether with local actors of clustering, whether with the external actors that were attending the event (Lin, 2018).

Through the understanding in which the interorganizational level and the organizational level may be studied in an aligned way (Mudambi, 2002), this article defends the thesis that the relations of global and local company clusterings, causes effects on the creation of knowledge and learning, and these in the organizational innovation of the companies that compose a clustering and these in the organizational innovation of the companies that compose a clustering. Being the creation of Organizational Knowledge based on the work of Castro, Sáez López, López and Dorado (2007) whose definition points out that knowledge is created through a dialogue between tacit and explicit knowledge, socialized, externalized, combined and internalized (Nonaka, 1994; Nonaka & Takeuchi, 1995). The organizational knowledge founded in the definition of Ramírez *et al.* (2011) whose objective was to comprehend if the company has learned in the last years, in other words, organizational learning refers to a process that detects the disfunction existent, studying the relation between action and result, changing experience in knowledge (Ramírez *et al.*, 2011). And finally, the interorganizational comprehended through result (new products or process), of time (pioneers, fast seconds, or delayed followers) and the supplies (efforts and resources that the company spends in innovation). (Jimenez-Jimenez e Valle, 2008). The organizational innovation is treated by the authors as an adoption of any new product, process, management innovation (Jimenez-Jimenez and Valle, 2008) at a given time. After, the methodological procedures of the research.

3.METHODOLOGICAL PROCEDURES

3.1 Characterization and research strategy

This study characterizes itself as exploratory research through the method of survey that allows comprehending the local and global relations (Cozby, 2003). The analysis level is the interorganizational and the organizational. In the scope of interorganizational analysis, are all the factors that compose the LPA, which are the institutions of support and public local organizations, as well as the own companies that develop *software*, that relates by the fact they are clustered and by means as planned actions such as events, seminars, fairs, courses, etc. . (Softex, 2019; Bathelt & Schuldt, 2008, 2010; Zhu *et al.*, 2018). In the scope of organizational analysis are the companies that develops software.

3.2 Research constructs and hypothesis development

Scholars presume that the *global buzz* has potential to foment global and local relations (Grabher & Maintz, 2006). In this regard, Uzzi (1996) and Rantise (2002) emphasize that the *global buzz* phenomenon has temporary characteristics, however, in such occasions this phenomenon may become permanent from a place, especially if this place attracts continuously talents and develops itself in a multicultural environment, as for instance, the case of female fashion industry of New York. Because it is, the first *global buzz* global construct is considered as predecessor of *local buzz* and *global pipeline*, and it was based in the work by Zhu *et al.*, (2018), being composed by 3 variables of mensuration, that after reformulation, it was dismembered in four items. Afterwards, the construct passed through content validity and translation for English Language. Soon, it is proposed the hypothesis:

H1: The *global buzz* influences positively the *local buzz*;

H2: The *global buzz* influences the *global pipeline*;

Most of the studies about *Local Buzz* are still in the theoretical scope justified by the difficulty de measure such phenomenon. Among the instruments of mensuration existent, it is possible to notice procedures and distinctive objectives of this research. Therefore, it was necessary to create measures of variables to help measure this construct. Based on Bathelt *et al.* (2004), Bathelt (2007) e Storper and Venables (2004), the variables were developed in the Portuguese Language and later reviewed, removing and/or rewriting those who presented double sense, ambiguity and were considered repeated. After this initial analysis, the instrument

was formatted in the version for semantic analysis with scale of agreement of Likert type, being 1-fully disagree and 7—fully agree.

The measurable variables of the *Local Buzz* construct of first order, as well as the other variables of the constructs that compose the theoretical model of this investigation, were submitted to a validation of content through five specialists in the field of network studies, interorganizational relationships and organizational studies. In which, through a document containing the presentation of the research, problems and objectives and the definition of each item to measure their respective construct. For this investigation, the focus in the *Local Buzz* construct will follow the 5 items created that are related with the following concepts: Spontaneous interaction, Diffusion of knowledge, Diffusion of information, Face to face contact and Development of values. Thereby, it is proposed two more hypothesis of this research:

H3: The *Local Buzz* influences positively the creation of organizational knowledge;

H4: The *Local Buzz* influences positively the organizational learning;

The *global pipeline* construct of first order was based on the work developed by Zhu, Chen and Lian (2018), chosen by the fact that the indicators identified in the work being pertinent to reveal the relations between the global and local actors. The work by Zhu *et al.*, (2018), had 3 mensuration variables. However, it was added the fourth and fifth variable with the objective of identify the communication channels that did not enter in the company clustering, but they send knowledge. Thus, five items in its total will compose the Global Pipeline construct and its operation passed through the validity of content. Thus, it is proposed the fifth and sixth hypothesis of this research:

H5: The *Global Pipeline* influences positively the creation of organizational knowledge;

H76: The *Global Pipeline* influences positively the organizational knowledge;

The Creation of Organizational Knowledge construct is a construct of second order understood through constructs of first order “socialization”, “externalization”, “combining” and “internalization”, composed by 5,3,4 and 3 measurement variables respectively (Castro *et al.*, 2007). The construct organizational learned it is a second order construct understood through first order constructs and it will be understood through 5 measurement variables of the work from Ramírez *et al.* (2011). Learning and creation of organizational knowledge offers

advantages to the companies as a better team development, better service quality, better life quality in the work and organizational innovation (Chan, 2003; Nonaka & Takeuchi, 1995; Castro *et al.*, 2007). Soon, we propose the hypothesis:

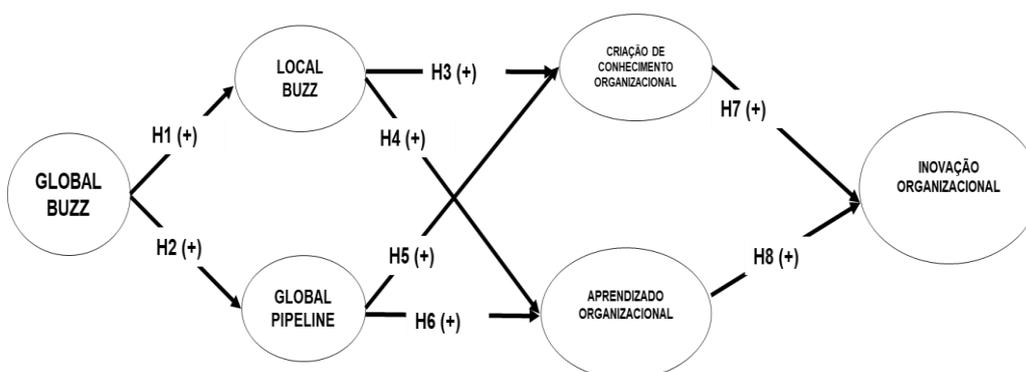
H7: The creation of organizational knowledge influences positively the organizational innovation;

H8: The organizational knowledge influences positively and organizational innovation;

The operation of the construct “Organizational Innovation” was based on the work developed by Jimenez-Jimenez & Valle (2008). The organizational innovation will be comprehended through constructs of first order “product innovation”, “Innovation of process” and “Management Innovation”, composed by 3 measurement variables each construct. The arguments presented, along with the hypothesis, originated the hypothetical structural method presented on the Figure 2, this model considers three forms of interactions in clustering companies: (i) *global buzz*, (ii) *global pipeline* and (iii) *local buzz*, comprehended as sources of creation of knowledge, learning and organizational innovation.

Figure 2

Hypothetical Structural Model



Source: Elaborated by the authors. Structural model substantiated in previous studies and proposed by the present research.

3.3 Samples and data collect

To ensure that the sample is being representative for the population, the criteria used was the participation of companies on the LPA *software* development of the city of Belo Horizonte-MG. It was obtained a data base with 371 companies, in which were obtained in its totality 81 valid answers from the managers of companies from the IT sector. The composition of the sample by segment involves 65 companies that develops *software*, 4 companies of the

hardware segment and 12 companies framed in the option of consulting firms and implementing systems; integrated management of IT; data intelligence and the providing services.

Afterwards, it was developed a survey with 43 items, organized in Likert scale type of seven points, being these dimensions, with its respective items: *Global buzz* (4 items); *Local buzz* (5 items), *global pipeline* (5 items); Socialization (5 items); Externalization (5 items); Combination (4 items); Internalization (3 items), Organizational Learning (5 items); Product Innovation (3 items); Process Innovation (3 items); Management Innovation (3 items). Besides the questions about company's characteristics as a market segment, main activities developed, number of employees, market time, and time on the LPA.

Before the data collect, it was made a pre-test with fifteen companies belonging to the LPA, of *software* development in Belo Horizonte-MG. Initially, the survey was followed to the managers of the companies requesting that they inform any doubt for the comprehension of the analyzed items. The respondents were trained that all the questions must be responded about the relationship of their company with other companies or with actors originating of the external environment to the LPA, so, that the creation of knowledge and the learning in the clustered companies happens, each company must relation with the other actors of its local environment and the external actors (Bathelt *et al.*, 2004). Thus, select the company that are connecting with the LPA it is important to avoid any bias in the research. After the application and contact with the respondents, they considered that the questions were easy to comprehend and it was not reported any problems by answer it.

The instrument of research became available to the target-people members in the beginning of March, 2020, right after this data, the country stopped because of the COVID pandemic in 2019, which resulted in delay of the data collect. At first the 371 emails for the managers of LPA remained stagnated for two months, without being sent in respect to the difficult moment that the population was facing, later through phone contact, each manager was contacted about the possibility to participate on the research, for those who accepted an email was sent. However, the stage of data collection lasted seven months, hitting the number of 82 valid instruments, making up about 22% of the population.

3.4 Treatment and data analysis

For the data treatment, to check the possible inconsistencies on the data collected, were analyzed unidimensional and multivariate *outliers*. In turn to check the unidimensional *outliers*, were evaluated observations through the values of score “Z” standard (z-standardized) in which

values of reference of scores pattern of $>+4$ or <-4 are interpreted as *outliers* to samples above 80 observations (Hair Jr; Black, Badin; Anderson & Tatham, 2009). By analyzing the standard values, the eight observation exceeds the reference value in the variable CO_4, soon as with the intention to improve the multivariate analysis proposed we excluded this case. To verify multivariate *outliers*, was analyzed the distance of Mahalanobis (D^2), in which the measure of each individual point in space of “n” dimensions in relation to the centroid of data sample, in which are used reference values of 2,5 to small samples and, of 3 or 4 for samples above 80 observations (Hair *et al.*, 2009). After the analysis, it was not necessary to remove cases in the data base analyzed, because the variables did not presented characteristics of multivariate *outliers*. To valid the constructs *Local Buzz*, *Global Pipeline* and *Global Buzz* was made the factorial exploratorily analysis suing the extraction method of the Main Components and the rotation method of Varimax. As the result of the analysis, it was obtained KMO of 0,851, however the indicators GP4 (0,291) e GP5 (0,128) presented factorial charges below 0,4. To check the normal distribution of the data it was used the level of significance to the differences in relation to a normal distribution. The results showed that the data presented distribution significantly different from a normal distribution($p<0,01$), which is consistent with suitability in the use of method PLS-SEM) (Hair; Hult; Ringle & Sarstedt, 2014).

To the quantitative data analysis, it was adopted the multivariate technique of modeling of structural equations through the method of the Partial Least Squares (PLS-SEM) in which allows to the researcher to evaluate, simultaneously, multiple variables and its relationships, as well as to modelate respectively relations between multiple dependent and independent constructs based on the theory, besides the possibility of checking if the data collected behave itself in a similar way to the idealized model(HAIR *et al.*, 2014; KLINE, 2011). In this sense, it was used a structural model to show visually the hypothesis, the relation between the constructs (represented by circles and non-directly measured) and the indicators (represented by circles and rectangles and it constitutes from directly measured observations) (HAIR *et al.*, 2014). Finally. The relations between the constructs were represented by unidimensional arrows, indicating the casual and predictive relations.

In some occasions, due to its complexity, some constructs are operated hierarchal, which made them be considered as models of a higher order, involving also two layers of variables (HAIR *et al.*, 2014). In this sense, the structural model tested is composed by the constructs of first order *Local Buzz*, *Global Pipeline*, *Global Buzz* and Organizational Learning, and the constructs of second order, Creation of Organizational Knowledge and organizational Innovation. The analysis through SEM, made the distinction between the model of

measurement (relation between the indicators and constructs) and the structural model (relation between constructs), besides supplying measures as composite reliability, convergent validity, and discriminant validity (HAIR et al., 2014). In this scenario the software SmartPLS was used for the analysis 3.3.3.

4 RESULTS AND DISCUSSION

4.1 Descriptive analysis of the indicators

For the analysis of the indicators it was used the descriptive statistic of measures of position (medium) and variability (standard deviation), through an interrupted scale of 7 points. In relation to the constructs aimed at the organizational level, it was noticed high medias for the items of the dimension “Socialization”, specifically on the items SO3 and SO5, as well as the items of the construct “Organizational Learning”, specifically on the items AO2 (5,80) and AO4 (5,79). Such items were created with the objective to measure the capacity of the company to share beliefs, values and ways of thinking, capacity to accomplish activities outside the local environment and possibility of obtaining skills and knowledges. In other words, the items that presented high media are related to the intention of the company members investigated outside and inside of its organizational environment.

In relation to the constructs aimed at the interorganizational level we noticed high media for the item GP4 of then construct *Global Pipeline*, being such item created with the intention to complement the scale of analysis created by Zhu *et al.* (2018). Still about the items related to the interorganizational environment it was identified high media for the item GB1 of the *Global Buzz* construct, in which analyzes in the environment studied the events that has heterogeneous actors. Thus, the items that presented high media meet the main objective of this study: To analyze relations in the interorganizational environment and its possible implications in the organizational environment.

The dimensions that had less values of medias refers to the *Local Buzz*, construct, specifically the items LB1(4,10), LB3 (4,16) and LB4 (4,17). Such items refer to the exchange of information and knowledge in an informal and spontaneous way, in the daily of the APL analyzed. Highlights that measure such relations it is not an easy task, due to the complexity of the construct (Stoper & venables, 2002), which it is not related with the degree of importance.

4.2 Evaluation of the measurement model

The constructs of the model were evaluated through the following statistical tests: i) internal reliability (Alpha de Cronback and composed reliability); ii) convergent validity (*average variance extracted* – AVEs and factorial charge); iii) discriminating validity ((Fornell-Larcker, crossed charge and test of Heterotrait-Monotrait - HTMT) (Hair *et al.*, 2014). Primarily, it was analyzed the internal reliability of the model, whose stage expects that the indicators present internal consistency and contributes for the measurement of the construct in a reliable way. The first results pointed that the constructs of the model did not present internal consistency problems, since the values of Alpha de Cronbach were bigger that 0,6 and the reliability composed presented values above 0,7 according to the Table 1.

In the meantime, the convergent validity seeks to dimension until which point a construct converges in its indicators (HAIR *et al.*, 2014). For this purpose, we use the value criteria of AVEs bigger that 0,50 (HAIR *et al.*, 2014). Thus, when the AVEs are bigger than 0,50 we admit that the model converges to a successful result (Hair *et al.*, 2014; 2016). Initially, the *Global Pipeline* construct presented value of 0,470 of AVE, in other words, smaller than 0,50. In these situations, we must analyze the factorial charge of the constructs of the measurement model with the objective to remove possible indicators that presented lower charges, and consequently, increase the convergent validity. This kind of analysis consists in the charge exposition of each reflexive variable of the model and allows to check the consistency of such variables, in which indicators with charges inferior to 0,40 must be excluded and indicators with charges between 0,40 and 0,70 must pass through analysis of the impact of the exclusion under the values of AVE and composed reliability (Hair *et al.*, 2016).

After analysis of the charges of the *Global Pipeline* construct, it was removed the indicator GP_5 (factorial charge: 0.583). With the exclusion of this indicator, occurred an increase of the AVE for 0,550, indicating convergent validity among the items of the *Global Pipeline* construct. After the removal from the item GP_5, the model was recalculated, and the new values of reliability and convergent validity (AVE) are presented in Table 1.

Table 1

Internal reliability and convergent validity

Second order construct	First order construct	Alfa de Cronbach	Composed Reliability	AVE
Creation of Organizational Knowledge	<i>Global Buzz</i>	0.810	0.876	0.640
	<i>Local buzz</i>	0.860	0.900	0.646
	<i>Global Pipeline</i>	0.699	0.818	0.535
	Socialization	0.893	0.923	0.707
	Externalization	0.692	0.830	0.621
	Combination	0.684	0.807	0.514
	Internationalization	0.813	0.889	0.728
Organizational Innovation	Organizational Learning	0.964	0.972	0.873
	Product Innovation	0.930	0.955	0.877
	Innovation Process	0.929	0.955	0.876
	Management Innovation	0.897	0.936	0.830

Source: Research database (2021).

Once that the reliability and the convergent validity were established with success, the next step is to analyze the discriminant validity of the constructs. The first criteria analyzed to discriminant validity was the Fornell e Larcker criteria (1981 apud *Hair et al.*, 2009), that emphasizes if the square root of the variance of each construct is bigger than the correlations with the others. The constructs of the model (AO, CO, EX, GB, GP, IA, IPR, IP, IN, LB and SO) did not present problems of discriminant validity according to the Fornell e Larcker criteria(1981 apud *Hair et al.*, 2009). Thus, follows with other criteria used to evaluate the discriminant validity, the analysis of crossed charges of the indicators. It was observed that the indicators of each construct in which are associated presented higher crossed charges, non-highlighting signs of discriminant validity problems. Afterwards, was analyzed the discriminant validity through the matrix correlation of Heterotrait-Monotrait (HTMT), in which indicates a potential problem of discriminant validity if exist correlations among the superior constructs to 0,9 (*Hair et al.*, 2016).

4.3 Evaluation of the structural model (H1 to H8)

In relation to the results of the structural model, it was analyzed the coefficients of path of the model, that were significate (structural coefficient (β) > 0,20,value of $t > 1,96$ and $p - value \leq 0,05$),so you can accept the hypothesis tested in relation to *global buzz*, according to the results presented as it follows.

Table 2

Final synthesis of the results

Relation	Structural Coefficient	Standard Error	value - t	value - p	Situation hypothesis
H1: <i>Global Buzz -> Local Buzz</i>	0.354	0.115	3.068	0.002	Confirmada
H2: <i>Global Buzz -> Global Pipeline</i>	0.564	0.094	5.992	0.000	Confirm
H3: <i>Local Buzz -> Creation of Organizational Knowledge</i>	0.116	0.119	0.980	0.327	Rejected
H4: <i>Local Buzz -> Organizational Learning</i>	0.215	0.108	1.990	0.047	Confirm
H5: <i>Global Pipeline -> Creation of Organizational Knowledge</i>	0.292	0.098	2.964	0.003	Confirm
H6: <i>Global Pipeline -> Organizational Learning</i>	0.282	0.120	2.353	0.019	Confirm
H7: <i>Creation of Organizational Knowledge -> Organizational Innovation</i>	0.460	0.121	3.803	0.000	Confirm
H8: <i>Organizational Learning -> Organizational Innovation</i>	0.327	0.112	2.930	0.003	Confirm

Source: Research database (2021).

The first and second hypothesis of the model (**H1: *global buzz*, influences positively the *local buzz*; H2: *global buzz*, influences positively the *global pipeline***) emphasizes that the relations that happen specifically in events may possible, in the future, daily relations in an LPA, and may also, provide relationships with the external actors. It was observed that the relations that happens in temporary events has the potential to foment the relations in the local environment of LPA's setting up the first contribution of this research. It was checked that the *global buzz* influences the local relations, in other words, the **Hypothesis 1 ((H1: *global buzz* → *local buzz*))** indicates that the relations that happen in temporary events may keep beyond the temporal activity of the events and persist, has long duration, and remain through time in daily LPA. We checked also, that the *global buzz* possibilities not only the relations between the actors of the LPA, but provides trades between external actors that were presented in the event through the **Hypothesis 2(H2: *global buzz* → *global pipeline*)**. In both hypothesis a chronological order was assigned, in other words, the events passed to be boosters of *local buzz* and *global pipeline*, extending the comprehension of the dichotomy of *buzz and pipeline*.

In this sense, the hypothesis refers to the fact that, in cases of *global buzz* occurrence and interactions in events of diverse natures, there is the possibility of such relations expand itself through local actors and external actors. Everything points that the contact made in events may become in future partnerships, or that the events have potential to promote contacts still non-existent in daily organization. That because such events reunite agents (company

representants, scientists, specific professionals, exhibitors, visitors and observers) regionals and international and create temporary spaces to present ideas, exchange of information and communication through face to face contact (Bathelt; Malmberg & Maskell, 2004; Bathelt & Schuldt, 2010) and that transcends to the local environment of the clustering.

Following the analysis of the hypothesis, it is possible to observe that the **Hypothesis 3: Local Buzz** influences positively the creation of organizational knowledge presented $\beta < 0,2$, statistic t under 1,96 and p -value $> 0,05$, in other words, it was not confirmed. This hypothesis was tested with the objective to check if indeed, the local interactions has potential to foment the creation of knowledge in environmental knowledge of LPA studied. However, such fact was not supported by the results of the research, by focusing on the capacity of local social interactions to influence in the creation of organizational knowledge, the empiric results did not confirm the relevance of spontaneous and informal relations in the process of socialization, externalization, combination, and internalization of knowledge. Thus, the creation of knowledge in clustered companies does not have a direct relationship with the *local buzz*.

This result is compatible with the one from Storper & Venables (2004) and Bathelt (2007), which highlights that the *local buzz* has as objective to provide the acquiring and exchange of information through face-to-face contact. In this context, the actors do not need to research its environment of make specific investments to gain access to the information that is broadcasted through *local buzz*. Instead, they are automatically exposed to information (news, reports, gossip, rumors and recommendations about technologies, markets, and strategies) (Bathelt, 2007). However, although the studies quoted pointed that the *local buzz* perform an auxiliary role in the acquisition and exchange of information, in the literature review was identified the possibility of the local interactions promote the acquisition face to face, the co-presence and co-location of people and companies in a same sector, place or region (Bathelt *et al.*, 2004; Mackinnon; Cumbers & Chapman, 2002; Gertler, 1995; Maskell, 2002; 2004). The capacity of absorption may be a justification for the result founded in Hypothesis 3, according to Giuliani (2005), to occur flows of knowledge in *local buzz* the actors involved may have capacity of absorption, which implies that not all of the actors can make use of the content of *local buzz*, even that they are interacting socially.

In the fourth hypothesis of the research, **Hypothesis 4: Local buzz** influences positively the organizational learning, the results of the coefficient of path were significant, thus being able to accept the hypothesis tested. That way, the *local buzz* influences positively the organizational learning in the LPA of development of software studied, showing the relation between action and result, organization, and its environment (Ramírez *et al.*, 2011).

Faulconbridge (2007) affirmed that the physical proximity is a success factor in the learning among the individuals. In this case, the fourth hypothesis, **Hypothesis 4: (local buzz → organizational learning)**, describes that the more actors in an LPA relate to each other on a daily basis, in the local environment, in a fluid way, the greater the tends to be the disposition for the organizational learning in these companies that participates in this kind of interaction. By focusing on interorganizational level, the empiric results of this study confirm the importance of interorganizational relationships, specifically the local ones, in the process of learning in clustered companies. Was expected a positive influence, since scholars as Bathelt et al. (2004) and Storper & Venables (2004) emphasized in their theoretical studies that such relation happens in practice, but it was not tested yet. Thus, under the perspective of *local buzz* may be inferred that the local relations developed among the local actors encourage the learning inside the organizational environment. Such relation occurs in front of the development of trust, in a spontaneous way, through face-to-face interaction, becoming, however, encouraged of organizational learning.

Comprehending the creation of knowledge through communication channels may help even more in diffusion and proliferation of knowledge among the local actors (Bahlmann, 2009; Trippel *et al.*, 2009; Bathelt *et al.*, 2018; Bathelt; LI 2020), in this sense, the fifth hypothesis of this research (**Hypothesis 5: global pipeline → creation of organizational knowledge**) was confirmed, in other words, the *global pipeline* influences in a positive way in the creation of knowledge. The *global pipeline* require investments, planning and may assume several ways: strategical partnerships, practice communities, participation in temporary events, etc. (Bathelt; Malmberg & Maskell, 2004). However, the exchange of informations originated of these external connections influences the organizational environment of clustered companies. In this environment, the creation of knowledge with the help of *global pipeline* refers to the ways, which the companies enjoy, and mobilizes different sets of knowledges in space and integrates them in their corporative network. Soon, we understand that its main task is to create routines and organizational practices efficient for exchange of external knowledge in organizational environments. (Bathelt & Li, 2020). This scenario supports the studies of (Coenen; Moodysson; Ryan; Asheim & Phillips, 2006) and Gertler & Levitte (2005) that revealed at the same time in which actors are inserted and interacts in local environments, they also are involved with the global interaction through partnerships, with the objective to create knowledge.

The sixth hypothesis (**Hypothesis 6: global pipeline → organizational learning**) was confirmed, in other words, the *global pipeline* influences in a positive way in the organizational knowledge. The concept of organizational knowledge adopted in this research examines the

relationship between the organization and its environment, whose intention is to know of the company has learned in the last years. Thus, the interest is between the action and result (Ramírez *et al.*, 2011). The seventh hypothesis, (**Hypothesis 7: Creation of Organizational Knowledge → Organizational Innovation**) was sustained by the results of the research, which corroborates the study of Lorentzen (2005), that emphasizes that the local relations between companies that has technological and economical proximity aids in the obtaining of knowledge by part of the companies involved and its knowledge is useful for the innovation.

The dimension created of organizational knowledge is about the capacity of a company to create knowledge, disseminate it and incorporate it to products and services and systems (Nonaka & Takeuchi, 1995). In this perspective, the knowledge is created through a dialogue between tacit and explicit knowledge, in which the socialized knowledge is externalized through combination and after internalized (Nonaka, 1994; Nonaka & Takeuchi, 1995). Therefore, such dimension was understood with the intention of understand the process of socialization, externalization, combination, and internalization in internal environment of the companies that compose the LPA studied. In turn, the organizational innovation is about the adoption of any new product, process and management innovation (Jimenez-Jimenez; Valle, 2008; 2011). Regarding this hypothesis, the creation of knowledge influences in organizational innovation.

The **Hypothesis 8: Influence of Organizational Learning influences positively the Organizational Innovation**, was sustained by the results of the research Baptista & Swann (1998) and Isaksen (2006) highlighted that the *clusters* has potential to promote the capacity of the companies to innovate. Isaksen (2006) compared companies in *software cluster* of Oslo with similar companies in Norway that is not located in *clusters* and concluded that the clustered companies has higher capacities to innovate. One possible justify for these has higher capacity to innovate is the knowledge acquired and exchanged between the local and global actors because such companies are relatively more involved in P&D activities, cooperate with more local partners and are more likely to exchange informations.

Additionally, were used two indicators to estimate the quality of model adjust, of F² Effect or Cohen's indicator and relevance or predictive validity Q² or Stone-Geisser Indicator. The first (Q²) evaluates how much the model approaches of what it is expected from its (or the quality of prediction of the model or accuracy of the model adjusted). As evaluation criteria must be obtained values bigger than zero (Hair *et al.*, 2014). A perfect model would have Q² = 1, (shows that the model refers to reality—no mistakes). The second (f²) is obtained through inclusion and exclusion of constructs do the model (one by one).

Therefore, it is evaluated how much which construct is “useful” for the adjust of the model. Values of 0,02, 0,15 and 0,35 are considered small, medium and big, respectively (Hair *et al.*, 2014). Also f^2 is evaluated by the reason between the explained part by the model and the non-explained part ($f^2 = R^2 / (1 - R^2)$). Both are obtained by the use of Blindfolding modular on SmartPLS (vide Figure 10). The values of Q^2 obtained by the reading of general redundancy of the model and f^2 by the reading of communalities (vide Table 3). The interpretation of the Table shows that both values of Q^2 and f^2 indicates that the model has accuracy and the constructs are important for the global adjust of the model.

Table 3

Values of F^2

Construct	Q^2	F^2
<i>Global Buzz</i>	*	0.422
<i>Global Pipeline</i>	0.155	0.287
<i>Local Buzz</i>	0.065	0.512
Organizational Learning	0.142	0.789
Creation of Organizational Knowledge	0.047	0.375
Organizational Innovation	0.276	0.603

(*) Exogenous Variable

Source: Data research

5 Conclusion

This research was based on the model made by Bathelt, Malmberg e Maskell (2004), which provides a vision about knowledge and innovation in company clusterings. The analyzed fact in these approaches is about the spontaneous relations between the actors , which presumes that the knowledge or the information circles more easily inside the cluster (Storper e Venables, 2004; Bathelt, 2007) and in smaller scale, that the contributions of the interaction with external actors assume that the global dynamic provides higher informations and knowledge for the inter-organizational environment (Malmberg & Maskell, 2006, Zhu *et al.*, 2018, Bathelt & Li, 2020).

The current concept debate suggests that the innovation in *clusters* is best seen if it is based on binds of global and local knowledge, in other words, through a combination of *local buzz*, *global pipeline* and *global buzz*. However, the approaches about *buzz* and *pipelines* does not provide a comprehension of the influence of the global and local interactions in the organizational environment of clustered companies. Thus, this research aimed to understand the effect of the *local buzz* *global pipeline* and *global buzz* in the creation of knowledge and learning and these, in innovation of companies that compose the software development LPA

from BH. We looked for understand how the relations that happen in the inter-organizational level in local and global environment influences the organizational environment of clustered companies, specifically the software development LPA from Belo Horizonte-MG. The relation between these levels shows not only an actual theme and of interest for managers and scholars, but also a lack in literature, which indicates the need of empirical researches to evaluate and test this influence.

The first found is about the local relations on LPA, the *local buzz*. It was noted that *local buzz* (which happens in organizational environment) does not have potential to influence itself positively in the creation of knowledge in the organizational environment. The results points that there is in the local environment different kinds of interactions, dealers, service providers, consulting firms, clients and competitors. Therefore, in these interactions occurs exchange of information, which are fundamental to have access to update about any managerial specific subject that solve routine problems of the managers. Although the reckoning of the importance of this phenomenon, the managers do not realize a direct connection of *local buzz* with the creation of organizational knowledge. In the meantime, we checked that the LPA is dynamic, that the actors talk with themselves, exchange information and recognize the importance of *local buzz* for the organizational knowledge, in which the more the relations develops itself, the more the companies can learn.

In relation to *global buzz* (inter-organizational environment) the results illustrate a particularity of this phenomenon by identifying that the interactions that happens in temporary events has the potential of has continuity daily on the APL among the local actors (in *local buzz*) as well as the actors of LPA with the external actors that participated of the events (in *pipeline*). In relation to *global pipeline* (inter-organizational environment), the results indicate that the information and the knowledge originated from external actors favors the creation of organizational learning in internal environment of the companies that compose the LPA. In this scenario, the conceptual contribution is in the understanding that this kind of interaction, by being planned, has an objective defined and provide expectations by part of the actors involved, provides better levels of exchange of information through external communication channels.

Highlights the contribution of the GP4 item for the *global pipeline* construct. Such item was created with the objective to complement the scale analysis created by Zhu *et al.* (2018), with the objective to measure if the investigated companies made external partnerships. In the opportunity, it was noted that this item has the capacity to infer about the access to *pipelines* outside the cluster environment, contributing with the operation of the construct. Thus, it is noted that importance of *global pipeline* on LPA and the importance of foment the entrance of

external agents in this environment, specially through temporary events, may, in this way contribute to the development of the sector and consequently the local development.

Finally, the organizational innovation in LPA studied is result of a complex architecture of local, national, and global *spillovers* that are selectively combined with connections of knowledge and learning. Therefore, the managers may widen the capacity of organizational innovation by taking conscience of the importance and the decision to interact more with the global and local actors.

The theoretical contribution of this study is in the robustness to the approach about *buzz* and *pipeline*. First, was founded empirical evidence about the effects of the *buzz* and *pipeline* in the organizational environment, specifically in the creation of knowledge and learning, allowing to explore the understanding about the relation between the inter-organizational and organizational level of clustered companies. Another contribution consists in the development of relationship still not explored on the approach adopted (learning) in already existent models (*local buzz and global pipeline*), in a context still not explored, Local Productive Arrangement -LPAs. Contributes also with the understanding that temporary events have the potential to foment the relationship in permanent *clusters* which the informal and spontaneous interaction does not have the capacity to influence the creation of knowledge on the internal environment of clustered companies. The *global pipeline* brings strategical information to the internal environment of the cluster justifying its potential to influence on the creation of learning and organizational knowledge. It also highlights, still the contributions on measurement of *local buzz* construct and *global pipeline*.

As practical contribution, this investigation collaborates with companies and actors that are objects of inter-organizational relations on LPA of *software* development of the city of Belo Horizonte-MG, helping them about the importance of local and global relations between the agents involved. Furthermore, this study contributes with the actors of public and private nature responsible for the execution of actions of development for the sector, helping them in possible plans of improving and in the local development. Furthermore, it is expected that the actors of the LPA comprehend better the effects of the local and global interactions for the creation of knowledge, learning, and organizational innovation, once that the comprehension of such effects may allow the company managers and institutions of support to develop strategies able to promote a better and more efficient local and global interactions both in the day-to-day running of the organizations as well as at events and outside the LPA.

Although this study brings contributions to the literature and provides practical guidance for managers and actors, in the realization of this research were found some limitations. The

first refers to the data collected on exploratory research, because it was not possible to interview some important actors of LPA. The data collected happened along with the beginning of COVID-19 pandemic in Brazil, becoming the moment inappropriate to go to the companies, to talk about the importance of research and to require the participation on interviews, considering that the personal contact becomes more efficient than the contact by *e-mail* and/or by phone. Moreover, it is considered that the managers were passing through an atypical moment, not having any disposition to participate in interviews. Another limitation is the operation of *local buzz* construct because no matter how that measure this construct for the first time being a contribution in qualitative part of the research, was noted difficulty on the correct comprehension by the respondents of survey. This reservation is made even with all the methodological procedures followed in quantitative. In this research, it was possible to capture the perception of the managers and support institutions of LPA, in other words, the contributions are based on the vision of the company managers that relates in LPA, besides the support institutions that makes actions in this environment. One limitation was not able to capture the perception of the other members of LPA, such as suppliers, clients, partners, research institutions. etc. Research with several actors may bring more precise contributions about the *local buzz*, *global pipeline*, and *global buzz*.

To go deeper in the comprehension of *local buzz*, *global pipeline* and *global buzz* and its capacity to influence the clustered companies, it is suggested for future research comparative studies that allows to infer if the geographical environment and the socioeconomical context of LPA are determinants for the *local buzz*, *global pipeline* and *global buzz*, as well as the influence in the creation of knowledge, learning and organizational innovation. Moreover, it was found evidence that the capacity of absorption may be an explanation for some companies could not create knowledge through *local buzz*. Thereby a suggestion for future research is to check this kind of relation deeper, focusing essentially on local relationships, because despite the informal character, studies prove the importance of these local relationships to provide knowledge on *cluster*. Thus, we may inquire which are the skills needed to the companies to create knowledge through *local buzz*. It is therefore necessary to check if, indeed the capacity of absorption is a limiting factor.

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