Organizational learning: a basis for the incorporation of information and communication technologies in colombian microenterprises

Aprendizagem organizacional: uma base para a incorporação das tecnologias de informação e comunicação nas microempresas colombiana

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ABSTRACT
This article develops a review of literature in different specialized databases where 54 articles related to models of technological acceptance, organizational learning, industries 4.0, and information and communication technologies were analyzed. The document initially presents a description of ICT (Information and Communication Technologies) and its advantages in the microenterprise sector, subsequently addresses some of the technology acceptance models, followed by conceptualizing organizational learning, and finally exposes the challenges of the world of industry 4.0 and what is necessary to achieve a process of incorporating ICT in Colombian microenterprises.

Keywords: information and communication technologies, technological acceptance models, organizational learning, microenterprises, industries 4.0.

RESUMO
Este artigo desenvolve uma revisão de literatura em diferentes bancos de dados especializados onde foram analisados 54 artigos relacionados a modelos de aceitação tecnológica, aprendizagem organizacional, indústrias 4.0, e tecnologias de informação e comunicação. O documento inicialmente apresenta uma descrição das TIC (Tecnologias da Informação e Comunicação) e suas vantagens
no setor das microempresas, posteriormente aborda alguns dos modelos de aceitação de tecnologia, seguido pela conceituação do aprendizado organizacional, e finalmente expõe os desafios do mundo da indústria 4.0 e o que é necessário para alcançar um processo de incorporação das TIC nas microempresas colombianas.

Palavras-chave: tecnologias de informação e comunicação, modelos de aceitação tecnológica, aprendizagem organizacional, microempresas, indústrias 4.0.

1 INTRODUCTION

This article is part of the work developed in recent years in the SEAD UAM research group of the Autonomous University of Manizales in relation to the incorporation of ICT (Information and Communication Technologies) in microenterprises.

The objective of this article is to review the literature that allows proposing a possible ICT training program for microentrepreneurs that takes into account the principles that are part of the technology acceptance models and that directly influence people’s attitudes or behaviors to appropriate and make use of ICT. The training program seeks to promote organizational learning that allows microenterprises to face the challenges brought by the world of industry, taking advantage of the incorporation of ICTs in different organizational processes.

Learning is the process of training collaborators in organizations; it is the instrument used to transfer knowledge and convert learning into institutional knowledge that serves to achieve objectives set by company managers.

The learning processes are defined as a set of activities authorized by the Directors to satisfy the knowledge, skills, or technical needs of the Human Capital on the Job. Having human capital trained to solve the problems that arise from their commercial relations represents a challenge because they depend on internal management, which frequently presents weaknesses mainly in those situations of a personal nature such as labor demotivation, internal conflicts that affect development of the functions and is reflected in complaints (Lozano and Díaz 2020 pg. 4)

Organizational learning is a recently developed academic area of professional practice and academic research. It has been created over recent years from different disciplines, such as economics, psychology, sociology, and management and administration. In administration, organizational learning plays a
fundamental role in productivity, innovation, decision-making, strategy, and organizational change (Garzón and Fisher 2008).

The evolution and development of ICT, in concert with the development of disciplines, impact the transformations of all fields that allow for the production of goods and services, in such a way that they generate innovative systematic processes recognized as industry 4.0 or the fourth industrial revolution.

The fourth industrial revolution is the integration of the value chain of smart factories to meet the demand of a constantly growing large public (Mon, Del Giorgio, De María, Figuerola and Querel 2018). In recent years, Industry 4.0 has been introduced as a popular term to describe the trend towards digitization and automation of the manufacturing environment. Industry 4.0 represents a new paradigm of processing and automation of manufacturing mechanisms. Despite its possible benefits of improvements in quality and productivity, this proposes the implementation of intelligent, widely interconnected, automatic, robotic, and systematized work environments at a high level (Oesterreich & Teuteberg, 2016; Rivera, Hermosilla, Delgadillo & Echeverría, 2021).

Organizational learning is viewed as a facilitating instrument for the transfer of information using ICT and becoming a vehicle for the exchange of knowledge that serves as a basis for achieving the insertion of ICT in microenterprises, turning this element into instruments of competitive advantage in an era like that of industry 4.0.

2 THEORETICAL REFERENCE

2.1 ICTS AND THEIR ADVANTAGES IN THE MICROENTERPRISE SECTOR

Incorporating and adopting ICTs in microenterprises is a process of transformation as well as fundamental growth because both allow optimally organizing all functional processes and strengthening the relationship with the external sector with the fundamental objective of making the organization more competitive.

According to Escandón and Hurtado (2016):
technologies such as information technology, communications, and telematics (p.184).

It is the incorporation of modern technologies that makes a difference regarding the performance of microenterprises in the globalized and highly competitive world and that in turn allows decision-making for the durability of the company.

Within the SEAD UAM research group, it is understood that the adoption of ICTs is a gradual process that is subject to the particular needs of microenterprises and the sector in which they carry out their productive activity. Due to the above, it is necessary to carry out the analysis of the needs around factors such as: globalization, social, economic, and especially technological changes, which quickly bring many transformations to the business world. The development of technology and the increasing use of ICT have an important role for organizations and business operations (Gërguri-Rashiti, Ramadani, Abazi-Alili, Dana, Ratten, 2017). This last aspect is important because the incorporation, use and appropriation of ICTs is closely related to the commercial growth of microenterprises.

In the case of the Colombian microenterprises studied within the SEAD UAM research group, potentializing their commercial operations processes becomes relevant and important. Equally important is understanding that these are the fundamental engine of the businesses in which they function. Likewise, one must understand where efforts should be made for training in the adoption of new technologies that help improve and increase the sales and marketing processes of the goods and services offered.

ICTs can help the business organization to achieve greater efficiency and lower cost in its operation. The World Bank Report, for example, reveals that ICTs have an imperative impact on the productivity, costs, income, and profitability of companies (Gërguri-Rashiti et al., 2017). Furthermore, ICT is an important factor that could drive innovation and business performance (Ramadani, Abazi-Alili, Dana, Rexhepi, Ibraimi, 2016).

The advantages presented about the incorporation, use, and appropriation of ICT in microenterprises should encourage the formation of human capital within the organization, having as a fundamental axis the organizational learning
processes that are the starting point for the generation and administration of knowledge. These processes must consider the needs of business training according to the productive activity of the company and the level of incorporation, use, and appropriation of ICT. Additionally the training and learning processes must start from the understanding of how various user-centered implications, according to what is proposed in the different models of technology appropriation, are responsible to the extent of their adoption.

In that order of ideas, microenterprises should not be oblivious to the processes of incorporation, training, learning, and adoption of ICTs in their daily work. This despite factors such as: lack of investment, ignorance of clear policies or lack of scope of a technological culture mean that the level of use and appropriation is not what is expected. This occurs because this type of organization focuses on costs, quality, and personalized attention, not on appropriating computer systems. As a result, they become less competitive in a growing, demanding physical and virtual market (Castellanos, Loaiza & Cuesta, 2016). Daily work becomes more time-consuming and resources are not optimized.

In Colombia, the Ministry of Communications implemented the National Plan for Information and Communications Technology PNTIC in 2008, which aims to improve organizational competitiveness and spread ICT in SMEs (micro, small and medium-sized enterprises), with the purpose that they improve the solution of the main problems in the use and appropriation of ICT. Partial information shows that a number of SMEs (approximately 38%) have access to the Internet and an even smaller percentage (25%) use ICTs in the processes of producing, distributing and marketing their goods and services (National ICT Plan 2008-2019). This demonstrates the low adoption of ICT in business processes.

Although the literature shows relevant findings regarding the incorporation of ICTs in microenterprises and the advantages in all their processes, acquiring different technological resources is not sufficient. Equally important is appropriating and adopting them, and making significant use of them to achieve organizational objectives.

2.2 MODELS OF TECHNOLOGY ACCEPTANCE

The adoption of ICT in microenterprises is a factor that drives business
development at the local, regional, national, and international levels as these constitute the scaffolding to position organizations in the globalized environment in which they must be sustainable and competitive. Thus, ICTs become a fundamental part of the company for carrying out daily activities in the subsystems that constitute it.

Due to the above, it is necessary to understand how people incorporate and appropriate technology in the daily activities of companies based on the different models of technology appropriation is necessary. These models are based on the following explained sociocultural and psychosocial psychological traditions:

- **Psychological tradition**: the appropriation of technology occurs when the subject can use any technological resource in any daily activity and in contexts other than the one associated with their domain (Wertsch, 1998).
- **Sociocultural tradition**: the subject recognizes that both social and individual factors are related to the cognitive processes (Fernández, Vallejo and McAnally, 2015) carried out by the individual in this case in the face of the appropriation of technology.

Different models and theories are proposed from the psychosocial tradition that explain how the appropriation of technology occurs. Some of them are described in the following.

**The Theory of Reasoned Action (TRA)** proposed by Ajzen and Fishbein (1980), proposes that the behaviour of an individual is explained by the relationships between beliefs, attitudes, intention, and behaviour, in such a way that if the individual's beliefs and attitudes towards technology are favourable, their behaviour can also be positive and if this, in turn, corresponds to what is socially appropriate, it will be much easier for the individual to incorporate and appropriate technology.

**The Technology Acceptance Model (TAM)** is based on the principles of TAR and takes into account the parametric behavioural attributes of the relevant components of attitudes, specifying how external components are causally linked to attributes such as beliefs, attitudes and behaviour (Liu, Chen, Sun, Wible, and Kuo, 2010).

The TAM adds to what was already considered by Ajzen and Fishbein (1980) the constructs perceived useful and easy to use. The perceived usefulness
is considered an extrinsic motivation to the user. It is defined as the subjective probability that a person, by using a given system, will improve their performance at work (...), ease of use, which refers to the degree to which a person believes that using a given system will be free of effort (Davis, 1989, p. 320). Therefore, an individual adopts technology if he finds that in addition to the fact that it does not involve any effort to use it, it is useful for the development of his work activities or daily life.

Using TAM as a basic skeletal model, Venkatesh and Davis (2000) propose TAM2 to include additional theoretical constructs encompassing social influence processes that affect an individual facing the opportunity to adopt or reject a new system (subjective norms, voluntariness, and the image) and instrumental cognitive processes (employment relevance, output quality, demonstrability of results and perceived ease of use) that expand the elements related to perceived usefulness. Therefore, the motivation for a direct effect of the subjective norm on intention is that people can choose to perform a behavior, even if they themselves are not satisfied with the behaviour or its consequences (Baby and Kannammal 2020).

For their part, in the TAM3 Venkatesh and Bala (2008) focus on adding aspects that affect ease of use such as computational self-efficacy, perception of external control, computational anxiety, computational curiosity, perceived enjoyment and objective usability.

The literature does not indicate which of the models is the most able to explain the adoption of technology by a person, however, due to its practical application in the business world, the TAM is considered the most commonly used (Pando, Períañez, Cañadillas, Charterina, 2016) in explaining the adoption of technology.

The Theory of Planned Behaviour (TPB) proposed by Ajzen (1991, 2011, 2014) tries to predict that the behaviour adopted by an individual in the face of the adoption of technology is influenced by internal and external elements that cause the behavior to be acquired or avoided, in such a way that the behaviour is directly related to the intention to act within a specific context.

Thus, behaviour is determined by:

The positive or negative attitude towards a certain action – attitude; ii)
the perception of approval or disapproval of the behaviour in question by the people who make up the individual's environment – subjective norm;
iii) the perception concerning the ability to influence the final result based on the tangible and intangible resources required to carry out the action – perception of control (Regalado, Guerrero and Montalvo, 2017, p. 144).

Finally, the Combination **Model of the Technology Acceptance Model and the Theory of Planned Behaviour (C-TAM-TPB)** by Taylor and Todd (1995) is described, which integrates the elements of the TPB into the TAM, that is to say that at the attitude, subjective norm and perceived behavioural control, integrates ease of use and perceived usefulness, taking into account that the original TAM is based on individual elements that influence the use of technology, and does not take into account social factors. This broadens the perspective from which the adoption of technology by individuals can be understood.

The models described are some of those that explain from psychology the individual and social factors that have an important influence on the process of use and appropriation of technology. These factors must be taken into account when proposing an ICT training program for microentrepreneurs, which considers the elements that improve the attitude of individuals towards the adoption of technology in such a way that their behaviour towards it is more positive and easy to use.

Additionally, the training program must involve autonomous work, but importantly it must propose cooperative and collaborative work spaces that allow everyone to work on their Near Development Zone (ZPD) which "is nothing more than the distance between the actual developmental level as determined by the ability to independently solve a problem and the level of potential development as determined through problem solving under the guidance of an adult or in collaboration with a more capable partner" (Vygotsky, 1978, p. 133), in such a way that learning is generated that is socially significant and that in some way can also influence behaviour and personal conduct towards ICT.

2.3 ORGANIZATIONAL LEARNING AND ICT INCLUSION

In Colombian microenterprises, the learning process is a fundamental element because it starts from the experience that the owners of the business have and that becomes the main intangible, because this is the one that helps to crystallize the proposed business and to start the business idea that becomes a
microenterprise.

In accordance with the above, the knowledge that the person or persons have of a business, it is the fundamental axis to begin to execute the ideas and proposals within the microenterprises, this knowledge that microentrepreneurs have of their business is what makes new microenterprises flourish in the country.

For Oviedo, Castellanos, Riquelme and García del Junco (2014), organizational learning is defined as the ability to use, disseminate, assimilate, and create knowledge acquired through evolution and training.

Thus, organizational learning contributes to business management and administration, favouring the adaptability of employees and the adoption of the organizational culture for the development of a particular position, guiding individual efforts to achieve strategic objectives.

The concept of organizational learning was initially used by March and Simon in 1958 and was spread by Peter Senge in 1990 in his masterpiece "The Fifth Discipline." In the 1970s and particularly in the following decade, interest in the research and study of organizational learning increased (Del Rio and Santiesteban, 2011).

According to Peter Senge (1990), organizations that develop learning exist because all people learn or are learners. A notable example is the learning of a child, which is necessary for proper development. This means that people learn constantly and when they join an organization help and contribute to the development of organizational learning.

Organizational learning is a process of organizations (large, medium, or small), (public or private), in which knowledge is created and acquired through collaborators with the purpose of converting it into institutional knowledge. This is then used to face and adapt to changes in the environment (Del Rio et al., 2011; Castañeda and Fernández, 2007).

Historically, the concept of organizational learning has as its characteristic the capture or generation of knowledge, while the fundamental aspect of knowledge management is the efficient management of the organizational knowledge that is possessed (Easterby-Smith and Lyles, 2003). However, Alvi and Denford (20011) affirm that the creation of knowledge is one of the processes of knowledge management.
Organizational learning is characterized by the management, acquisition, and transfer of knowledge that occurs between the employer and the collaborators within the organization. The search and management of knowledge in collaborators corresponds to a responsibility that implies the individual, group, and organizational levels (Castañeda, 2015; Crossan, Lane and White, 1999; Milia and Birdi, 2010).

In other words, in an organization, each collaborator carries out their learning process in different ways, in the same way that groups do through different learning mechanisms. Learning in the organization can be affirmed when knowledge is institutionalized. For organizational learning to be acquired, appropriate organizational conditions are needed. This means that the transfer of individual knowledge to the organization is not a mechanical or automatic process (Castañeda and Fernández, 2007; DiBella, 1995; Ulrich, Jick and Von Glinow, 1993; Senge, 1990).

Individual learning is oriented towards new experiences of knowledge accumulation. Collaborators develop capacities so as not to collect and accumulate information. They must learn to use it in tasks and processes that can improve their functions, discard unnecessary information and be willing to acquire new knowledge.

Organizational learning is based on the growth and development of efficient or high-performance work teams, which create constant learning and training routes, allowing for discarding those that are not useful and generating spaces that stimulate continuous learning through training that helps professional and group growth (Kleiner, 2000). Group learning is fundamental because it allows teamwork and the exchange of information to provide solutions and complement information.

Organizational learning is achieved when individual and group knowledge is institutionalized and knowledge is made available for use by members of the organization. In this way, organizational learning is achieved by acquiring and applying the values, techniques, attitudes, beliefs, and knowledge that increase the development, conservation, and growth of the organization.

In this order of ideas, organizational learning is a process of maturation and appropriation of knowledge and, in particular, it is an information transfer activity that individuals bring, socialize with their work group, and finally constitute learning
for the organization.

Therefore, knowledge is established within Colombian microenterprises through learning, and this is materialized in each of the actions and processes that are developed within microenterprises. This learning process is based on the knowledge that people have about a particular business and their ability to understand the environment in which the economic activity takes place. That is why, within microenterprises, the importance of knowledge management must be clear to become more competitive daily.

In current investigations, good organizational learning by the collaborators and the organization was determined to reduce problems such as low motivation, little appropriation of the organization, inefficiency, and dismissals. This explains how when a collaborator is updated and trained, he develops his work properly within the organization. An evolving culture of learning in the organization is a process that continuously helps to efficiently and effectively adapt to the market, turning working capital into a strategic tool for success (Rivera, 2019).

As part of this process of knowledge management through learning, microenterprises must face the new challenges that the incorporation of ICTs in their productive activities brings, being aware that this incorporation requires a learning process, which leads to the acceptance, adoption, and use of technology.

Although at the beginning of this section the importance of the experience of human capital for organizational learning was mentioned, formalizing training processes within organizations that allow the use and adoption of ICTs is essential, with the purpose of reduce the existing gaps, which can result in lower productivity, limiting the possibilities of growth of the organization and the well-being of the workers.

The use of ICTs offers innumerable possibilities for organizational management, but there is still a need to overcome certain individual resistances that limit the use of technologies to favour the development of organizational processes (Aguirre, 2018).

Consequently, it is important that the organization carry out its strategic planning process by incorporating training processes for the inclusion of ICT in its structure. These processes are aimed at meeting not only the strategic objectives, but also at facilitating the organizational learning process as a factor of
competitiveness (Ahumada, 2002). This should occur in such a way that knowledge management is institutionalized and an organizational culture of trust is generated so that information is learned and shared (Dimovski and Škerlavaj, 2004; Rueda, Tamayo, Acosta, Cueva and Idrobo, 2020).

Garvin (2000) defines a learning organization as one that skillfully acquires and transfers knowledge and one that modifies its behaviour as a reflection of new knowledge and adaptation to the environment. For Aramburu (2000), the learning of the organization is associated with the change of organizational behaviour, as well as with the support and creation of a knowledge base.

Recent concepts such as the study carried out by Manzano, Peñaranda and Páez (2019) affirm the positive relationship between ICT and organizational learning in micro, small and medium-sized companies in the city of Ocaña in Colombia, in which it was concluded that there is a positive impact between ICT and organizational learning that improves competitiveness.

For this, Rueda et al, (2020) suggest the use of the following ICT tools: "intranet, email, videoconferences, social networks, search engines, document management, electronic commerce, databases, virtual reality, artificial intelligence and support applications for each type of organization" (p. 82), which implies for the entrepreneur, recognizing the advantages and handling each of them, identifying the usefulness of each tool in daily work.

According to what has been presented, in the business environment it is very important to make efforts to establish organizational learning processes, which facilitate the incorporation and appropriation of ICT in microenterprises with the purpose of improving their productive processes, which contribute to durability, sustainability and organizational competitiveness.

2.4 INDUSTRIES 4.0, A CHALLENGE FOR MICROENTERPRISES

The term Industry 4.0 is used in Germany as a strategic initiative to position the country as the market leader for advanced manufacturing and production solutions. It is constituted on an international level to generate intelligent manufacturing and industrial production through the internet and digital technology (Cohen, Faccio, Galizia, Mora and Pilati, 2017).

In other words, digital technologies help the interaction of physical elements
(raw materials, machinery) in the digital world to incite a more effective and efficient production. Digital technologies are usually the famous clouds (data cloud), Big Data, cyber physical systems, sensory, as well as robotic technologies, additive or layer manufacturing, as well as 3D printers, robots, teleworking, remote payments, collaboration in shared documents, mobile communication, augmented reality, geolocation, apps and those that continue to develop day by day. According to Mendizábal (2019) "the fourth industrial revolution consists of, therefore, the application of new technologies in production processes in such a way that their operation is automated, intelligent and efficient" (p. 6).

It is a fact that the fourth industrial revolution emerges as a strategy for the implementation of state-of-the-art technologies, mainly in the industrial sector, which favours the growth and location of a nation, in this case Germany, in an advantageous economic position. However, it should be noted that in addition to Germany, other nations such as Spain with the so-called Connected Industry, the New Industrial France in France, and the Smart Manufacturing Leadership Coalition (SMLC) in the United States, also implemented the foundations of the fourth industrial revolution in their struggle to take the lead (Ricardo, Rodríguez, León and Medina, 2020).

Consistent with the preceding, the challenge for organizations in Latin America is even greater, since the companies and the professionals who run them have conditions that are different from those of developed countries in terms of access to and incorporation of production technologies such as ICT to account for the new trends in human development and the needs that the productive sector demands.

In Colombia, Betancur (2020) suggests that there are eight challenges on the way to the fourth industrial revolution, which are presented in Table 1:

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>New skills for the world of work.</td>
<td>The current world requires the development of new skills for the world of work, which implies changes in the training processes to try to reduce the gaps, especially in what has to do with the management of technology and especially ICT.</td>
</tr>
<tr>
<td>Available to small and medium businesses.</td>
<td>ICT should be within the reach of small and medium-sized companies, considering that most of them make up a large percentage of the country's productive sector.</td>
</tr>
<tr>
<td>Hybrid professional</td>
<td>Convergence of knowledge, skills and abilities is required to</td>
</tr>
<tr>
<td>profiles.</td>
<td>develop hybrid profiles through dual career training.</td>
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<tr>
<td>Harmony in a triple university condition: think, investigate and train.</td>
<td>The democratization of knowledge implies, on the one hand, the construction of different academic routes according to the needs of the people and, on the other, thinking research with social relevance to achieve relevant impacts.</td>
</tr>
<tr>
<td>Change and knowledge management.</td>
<td>It is essential to work with other disciplines or professions and to be open to change to carry out transformation processes within organizations, which implies cultivating attitudes, capacities and skills for problem solving.</td>
</tr>
<tr>
<td>Literacy and debates on digital transformation.</td>
<td>The university is the fundamental axis to raise discussions about the use of new ICTs and the digitization of processes within organizations.</td>
</tr>
<tr>
<td>Overcome structural deficiencies in education.</td>
<td>Deficiencies in training in basic sciences must be reduced so that they go hand in hand with the development of lasting skills and thus form human capital that can make use of ICTs in these areas.</td>
</tr>
<tr>
<td>Where should Colombia go?: identify opportunities, decentralize scientific research, focus on strengths.</td>
<td>The country must identify opportunities where education and especially research can make significant contributions regarding the use of different technologies in different fields.</td>
</tr>
</tbody>
</table>

Source note: Adapted from: Betancur B., J. (2020). 8 challenges on the way to the Fourth Industrial Revolution. EAFIT University Magazine, 55(175), 70-73.

In that order of ideas, the adoption of technology opens unsuspected horizons and with equal resources, higher levels of competitiveness are obtained. Of course, here a series of interests come together, where governments play a fundamental role in facilitating that, in this case, microenterprises can access useful technologies that promote their development and ensure that the social impact produced by ICTs is positive (Ricardo et al., 2020) to the extent that these facilitate greater interaction of the organization with customers, bringing benefits such as easy access to information about the characteristics of the product, the ease of purchase and distribution of the same, the forms of payment, the customer follow-up, and promotion, among others.

To carry out these activities, microentrepreneurs must cultivate "exclusive skills of the human being, such as creativity, motivation, innovation, cooperation, intuition, the ability to communicate and undertake, persuasion and originality" (Blanco, Fontrodona and Poveda, 2018, p.156) that lead to the significant use of ICT to achieve business purposes.

Despite the great advantages of the use of ICTs, if we approach the field of microenterprises, these present greater difficulty and challenges in terms of technological infrastructure, connectivity, appropriation of knowledge, and learning processes, which together combine the investment of resources and time to
incorporate new technology tools into their production processes.

Due to the above, the commitment of the directives and of each one of the collaborators is required to achieve a competitive and sustainable advantage from the adoption of ICTs, for which it is necessary to have suitable, qualified personnel willing to learn to cope with the constant changes to which the microenterprise is exposed.

As already mentioned, one of the biggest challenges of microenterprises in Colombia is competitiveness. Hence if a small or medium-sized company does not generate processes or strategies to keep up with the markets, it has little chance of growth or survival in the country. Consequently, to gamble on the revolution within microenterprises, it is necessary for them to incorporate new and better technologies into their production processes that help them to be durable over time and thus contribute to the development of the fourth revolution.

In this order of ideas, Ricardo et al., (2020) highlights that the World Economic Forum provides five key points to assess the degree of development of countries towards the Fourth Industrial Revolution:

- **Innovation and technology**: companies' ability to innovate and have the key infrastructure to adopt new technologies of the Fourth Industrial Revolution, with the aim of transforming production patterns.
- **Human capital and skills**: specialized knowledge is required to increase productivity. There is a need for an educated and flexible workforce and institutions that facilitate the insertion of people with the right profile into the world of work.
- **Global economy, trade, and investment**: Foreign direct investment and world trade benefit the creation of jobs and the transfer of knowledge between countries.
- **Natural resources and sustainability**: environmental sustainability and production that respects the environment are a competitive advantage.
- **Regulation and governance**: regulation can promote the adoption of technology or be an impediment (p.10)

Thus, the incorporation of microenterprises into the fourth revolution implies changes at different levels and training models that allow the development of different human capital skills, as well as specific actions by the government in
terms of resource management to achieve a positive impact on the path that microenterprises must follow to adopt ICTs in their production processes and contribute to the socioeconomic development of the country.

3 CONCLUSIONS

The incorporation and adoption of ICTs is a gradual and systematic process that responds particularly to the needs of microenterprises depending on the productive sector to which they belong and whose impact is related to the optimization of processes and the scope of competitiveness of microenterprises at the local, national, and international level. The use of ICT at the organizational level allows optimizing the activities carried out by the collaborators for the development of their functional processes in their job, contributing to the productivity of each of the areas within the organization.

In order to achieve the incorporation of ICT, it is necessary that the training processes whose purpose is to develop skills to make relevant use of technologies in the day-to-day of the company, take into account the different models of technological acceptance that allow, on the one hand, understanding and identifying the behaviours and attitudes of microentrepreneurs towards technology, and on the other, generate strategies such as organizational learning that include both cooperative and collaborative work with the purpose of facilitating learning and improving attitudes towards ICT.

Hence the importance that microenterprises structure within their strategic plans, organizational learning processes that contribute to the construction and transfer of knowledge regarding the use of the different ICTs in each of the processes where they are incorporated, in such a way that this knowledge goes from being individual knowledge to becoming institutional. Organizational learning should help human capital develop the necessary skills to manage ICTs and thus optimize functions in the workplace.

According to the above, organizational learning contributes to microentrepreneurs being incorporated more efficiently into industry 4.0 to compete and face the challenges that the adoption of ICTs brings, as well as the demands of the globalized context that unfold. It is important to note that the incorporation into industry 4.0 depends exclusively on the business needs according to the productive sector to which they belong and the growth projections of the microenterprise.
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