Knowledge management and artificial intelligence: a new horizon for university entrepreneurship

Gestión del conocimiento e inteligencia artificial: un nuevo horizonte para el emprendimiento universitario.

Amalio-Segundo Otero-Tapia[1]
Universidad Nacional Abierta y a Distancia – Cartagena, Colombia
amalio.otero@unad.edu.co

Remedios Pitre-Redondo[2]
Universidad de la Guajira – Riohacha, Colombia
pitre@uniguajira.edu.co

Meredith Jimenez-Cardenas[3]
Universidad de la Guajira – Riohacha, Colombia
meredith@uniguajira.edu.co

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Abstract

The objective of this article is to carry out an exhaustive scientific review of the available literature on knowledge management, artificial intelligence and its impact on university entrepreneurship. Through a rigorous analysis of various scientific sources, the article highlights how

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1 Master of Organizational Management UNAD Colombia. Teacher at the Universidad Nacional Abierta y a Distancia-UNAD. School of Administrative, Accounting, Economic and Business Sciences-ECACEN. Transversal 45 # 44A - 221. Cartagena-Bolivar.

2 PhD. Science mention Management. Rafael Belloso Chacín MAG University. In development and management of social enterprises and specialization in pedagogy and autonomous learning. professor Universidad de la Guajira kilometer 5 via Maicao.

3 PhD in Science Mention Management URBE Maracaibo. Magister in Education with Énfasis in Cognición. Uninorte, Magister in Teaching for Higher Education. UNERMB, Magister in Education with Énfasis in Cognición .Uninorte, Esp. in Management of Educational Institutions. unitolima, international academic pair-Mexico-Ecuador, Director of the research group Growing

knowledge management, understood as a set of processes and actions to improve the exchange, creation and application of information and skills, is complemented by the capabilities of artificial intelligence (AI) to enhance innovation and social and organizational development. This analysis includes definitions, theoretical models and general principles that illustrate the relevance of managing knowledge and applying AI tools within universities, key institutions in the generation and transmission of knowledge. The article also examines the concept of entrepreneurship, understood as the creation and development of innovative projects with economic, social or environmental purposes, and the characteristics that define a successful entrepreneur. In this context, it analyzes the role of artificial intelligence as a strategic tool to support the identification of opportunities, resource optimization and decision making in entrepreneurial projects. Likewise, the importance of fostering university entrepreneurship is highlighted, since students, having access to advanced knowledge, technological resources and innovation ecosystems, are in a privileged position to lead disruptive projects that integrate knowledge management and AI. The review concludes that universities play a crucial role in the training of entrepreneurs, not only in the creation of companies, but also in the development of competencies, skills and abilities needed to compete in an increasingly dynamic and digitized market. It is proposed that the incorporation of artificial intelligence as a central component in the contents and approaches of entrepreneurship education is fundamental to prepare students in a comprehensive manner, strengthening their ability to face the challenges of the knowledge economy and foster a more competitive and sustainable environment.

Keywords

Knowledge management; university; entrepreneur; entrepreneurship.

Resumen

El objetivo de este artículo es llevar a cabo una revisión científica exhaustiva de la literatura disponible sobre la gestión del conocimiento, la inteligencia artificial y su impacto en el emprendimiento universitario. A través de un análisis riguroso de diversas fuentes científicas, el artículo destaca cómo la gestión del conocimiento, entendida como un conjunto de procesos y acciones para mejorar el intercambio, creación y aplica-

ción de información y habilidades, se complementa con las capacidades de la inteligencia artificial (IA) para potenciar la innovación y el desarrollo social y organizacional. Este análisis incluye definiciones, modelos teóricos y principios generales que ilustran la relevancia de gestionar el conocimiento y aplicar herramientas de IA dentro de las universidades, instituciones clave en la generación y transmisión de conocimiento. El artículo también examina el concepto de emprendimiento, entendido como la creación y desarrollo de proyectos innovadores con fines económicos, sociales o medioambientales, y las características que definen a un emprendedor exitoso. En este contexto, se analiza el papel de la inteligencia artificial como una herramienta estratégica para apoyar la identificación de oportunidades, la optimización de recursos y la toma de decisiones en proyectos emprendedores. De igual manera, se subraya la importancia de fomentar el emprendimiento universitario, ya que los estudiantes, al tener acceso a conocimientos avanzados, recursos tecnológicos y ecosistemas de innovación, están en una posición privilegiada para liderar proyectos disruptivos que integren la gestión del conocimiento y la IA. La revisión concluye que las universidades desempeñan un papel crucial en la formación de emprendedores, no solo en la creación de empresas, sino en el desarrollo de competencias, habilidades y destrezas necesarias para competir en un mercado cada vez más dinámico y digitalizado. Se propone que la incorporación de la inteligencia artificial como componente central en los contenidos y enfoques de la educación emprendedora es fundamental para preparar a los estudiantes de manera integral, fortaleciendo su capacidad para enfrentar los desafíos de la economía del conocimiento y fomentar un entorno más competitivo y sostenible.

Palabras clave

Gestión del conocimiento; universidad; emprendedor; emprendimiento; inteligencia artificial.

Introduction

The verb to know, has been defined according to the RAE, as “to find out by exercise of the intellectual faculties the nature, qualities and relations of things” (Real Academia Española, n.d.), likewise “to understand, to notice, to know, to be aware

of someone or something", which allows understanding that the act of knowing something is to know about its very essence, its characteristics and its objective, therefore, knowledge according to the RAE, is "the action and effect of knowing", but it is also the "understanding, intelligence, natural reason". (Real Academia Española, n.d.)

Beltrán Jaramillo, (1999) cited by Ramírez & Martín Fiorino, (2008) defined management as the "set of decisions and actions that lead to the achievement of previously established objectives" i.e., management refers to the development of basic administrative functions such as planning, organizing, directing and controlling. Another definition of management is offered by Calderón-Hernández et al., (2011) cited by Ropa-Carrión & Alama-Flores, (2022) in which it is transposed to the administration of resources when it is studied through the behavior of individuals in organizations with reference to their capabilities, skills, abilities, motivations, moral values at work, as well as in the study of the formalization of process practices, standards and procedures for the achievement of the goals set.

In the current era, knowledge has emerged as the most valuable intangible resource for companies and society in general. For this reason, it is crucial to analyze the management of these knowledge assets within organizations, given that this management directly affects their ability to innovate and maintain a competitive advantage (Riascos & Aguilera, 2024).

Currently, knowledge is positioned as an essential intangible resource for organizations, and its effective management is crucial to foster innovation and maintain a competitive advantage (Riascos & Aguilera, 2024). This management becomes more complex in the context of artificial intelligence (AI), which has emerged as a disruptive tool capable of transforming knowledge management processes. AI not only makes it possible to analyze large volumes of data, but also to identify patterns and create adaptive solutions, facilitating real-time decision making.

Knowledge has acquired over time much importance and relevance because it has become a basic production element that allows social development, since this is the result of the combination of information, internal regulations, and experience (Rodríguez Gómez, 2006; Davenport & Prusak, 1998 Romero, 2016 cited by Villasana Arreguín et al., 2021). The management of this combination of information, internal regulations and experience is known as knowledge management, and it is essential to emphasize that this management is precisely the administration of an

idea, an initiative, a project, a company or, in this case, of the knowledge acquired. Knowledge in organizations is based on the knowledge of people, who move internally in companies (Herrera & Marquez, 2023), which means that organizations depend largely on the knowledge of their collaborators.

This knowledge and the management given to it is often channeled to entrepreneurship, which is a substantial part of the local, national, and global economy, hence the importance of being more aware every day as a society of the need for innovation and entrepreneurship to become a solid foundation of modern and sustainable economy. (Medina López, Moncayo Carreño, Jácome Alarcón, & Albarrasin Reinoso, 2017)

Strategically managed knowledge, in combination with advanced technologies such as artificial intelligence, can be channeled into university entrepreneurship, a fundamental building block for the global economy (Medina López et al., 2017). According to Tripopsakul et al. (2022), cited by Palomino, Bernal and Barbier (2023), entrepreneurship acts as a catalyst for economic growth by transforming knowledge into economic value. In this sense, universities, as spaces for the generation and transfer of knowledge, have the responsibility to foster an entrepreneurial culture, promoting in their students not only the development of technical skills, but also the ability to adapt to an increasingly dynamic and competitive environment.

According to Tripopsakul et al., 2022, cited by Palomino, Bernal, & Barbier, 2023, Entrepreneurship is recognized as a fundamental catalyst for the economic growth of a nation, since it transforms knowledge into economic value and stimulates the modern economy (Palomino, Bernal & Barbier, 2023), In this context, university entrepreneurship plays a crucial role by being a hotbed of innovation and new ideas. Universities, by promoting an entrepreneurial culture among their students and academics, not only contribute to the formation of future business leaders, but also facilitate the transfer of knowledge and technologies to the market

To meet the challenges of a competitive market, university entrepreneurs must be trained in skills that allow them to apply both their knowledge and artificial intelligence tools in the creation of innovative solutions and according to Fredy (2007) the best for this are the university students. Hence, university entrepreneurship is nowadays a tangible need, and for it to become a reality, university students need to be trained in entrepreneurial skills and in skills that allow them to become entrepreneurs (Innenarity, 2011 cited by Medina López et al, 2017).

In this context, it is essential to recognize that, as Serrano-Santoyo and Hernández (2020) point out, "in the face of this wave of axial changes, governments, non-governmental organizations, companies and academia are considering the strategies to be applied in order to take advantage of the benefits of Artificial Intelligence and related branches, and thus obtain a better economic and social positioning". This implies that the integration of these technologies not only redefines traditional business models but also requires the formation of a university profile that combines technical knowledge with leadership skills, innovation and adaptability, necessary to face the challenges of the globalized environment.

In the same vein, the university as the entity in charge of higher education (Vásquez, 2017), has established within its teaching principles as one of its main objectives, to train the entrepreneur, due to the fact that this is the one in charge of generating employment and moving the economy when they have decided that they have the necessary education to become entrepreneurs in the area they are most interested in or to which they have the best access. That is why Andrade & Bravo, (2009) state that1[sic]:

> "the training of labor competencies and the development of attitudes of entrepreneurship in higher education, can be conceived as an opportunity for professional training that is at the level of education should offer its students, giving the opportunity to open new spaces and generate academic conditions necessary for their development to be carried out in a comprehensive manner": quoted by Vásquez (2017)

Method

The review article, according to Vera Carrasco (2009) is a scientific document that does not have the originality factor but presents information on a specific topic in a systematic way and its purpose is complete research on the existing state of the art on the area of knowledge to be accessed.

The objective of a review article is broad, since its purpose is to identify the available bibliography on a topic, and it compiles previous research, and the questions that have not yet been resolved, on that topic or area (Icart Isem & Canela Soler, 1994 cited by Guirao, Olmedo & Ferrer 2008).

A review article according to Cué Brugueras, Díaz Alonso, Díaz Martínez, & Valdés Abreu (2008) contains information as a result of an exhaustive search in various scientific databases, as well as this article which used information from Redalyc, Scielo, ScienceDirect, EBSCO and Scopus databases.

For Merino - Trujillo (2013), the objective of a main article is the recognition of the current literature on a topic, that is, the number of existing research, as well as the most relevant advances in a certain range of time, likewise, these articles also have the objective of making known the areas of knowledge or research that have not yet been explored. The information in this article was obtained from the Redalyc, Scielo, ScienceDirect, EBSCO and Scopus databases.

Results

Knowledge Management

Knowledge management is defined by the Inter-American Law Bank as a conglomerate of actions and processes that allow strengthening the exchange of information and expertise in organizations and/or groups of professionals with the objective of enhancing the performance of the organization, group of professionals or results of any ongoing project. (Briceño, Strand, & Marshall, 2020)

According to the Technical Guidelines for Knowledge Management and Innovation (Función Pública, 2020) “knowledge management is understood as the process by which actions, mechanisms and instruments that generate, identify, capture, value, transfer, appropriate, analyze, disseminate and preserve knowledge are put into practice (...)”, so we can understand that knowledge management is any action that helps in the exchange and dissemination of knowledge among organizations and/or specific groups of society.

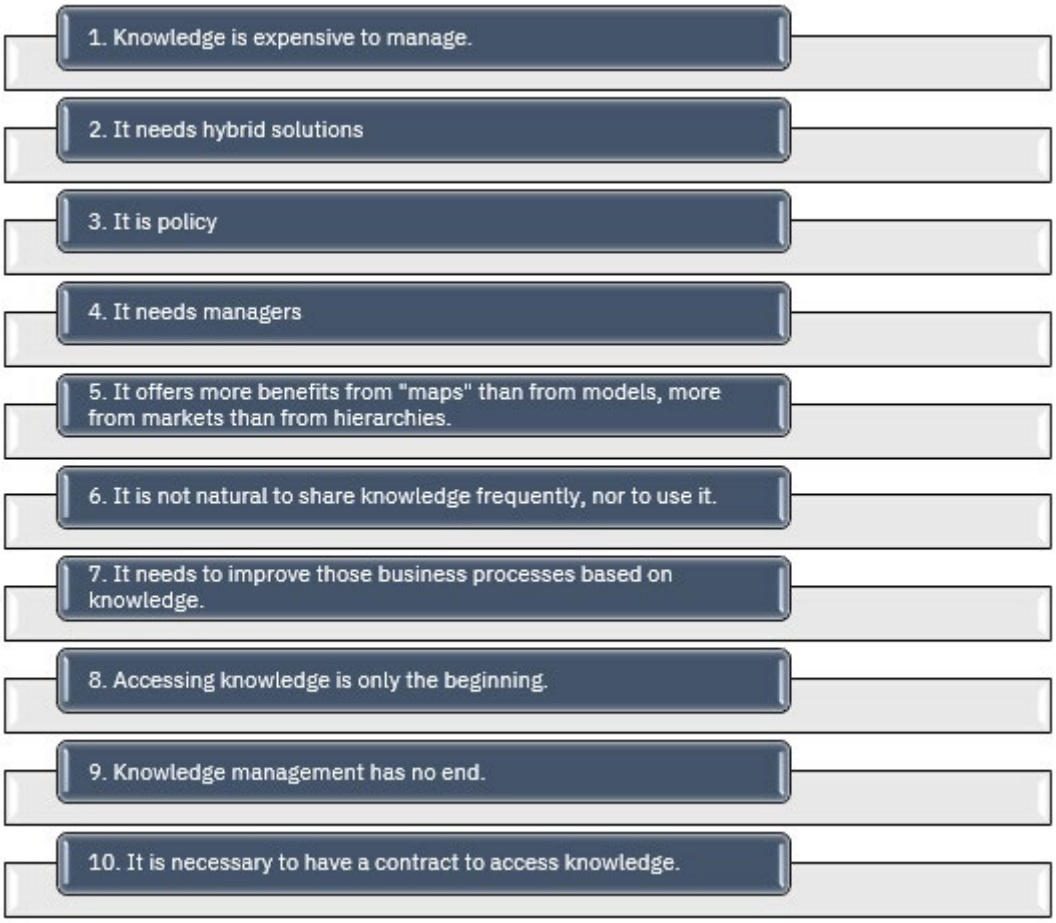
Knowledge management according to Blázquez (2011) cited by Luna Jiménez et al. (2017), has been studied with the aim of maximizing the contribution that organizations make to society, because thanks to globalization and the changes that this has brought about in the economy, universities need to manage these resources because they are generators of knowledge and train people.

The purpose of knowledge management is to help organizations to be more agile, efficient and innovative than the competition, therefore, it also deals with the

relationship and interaction between the organization and the surrounding environment, at the level of responsiveness and in general in all the actions it develops. Greiner et al. (2007) cited by Villasana Arreguín et al (2021).

Knowledge management, according to Davenport T. H. (1996) cited by Larrea Abásolo (2008), consists of 10 general principles that are described from a pragmatic perspective, as shown in Figure 1:

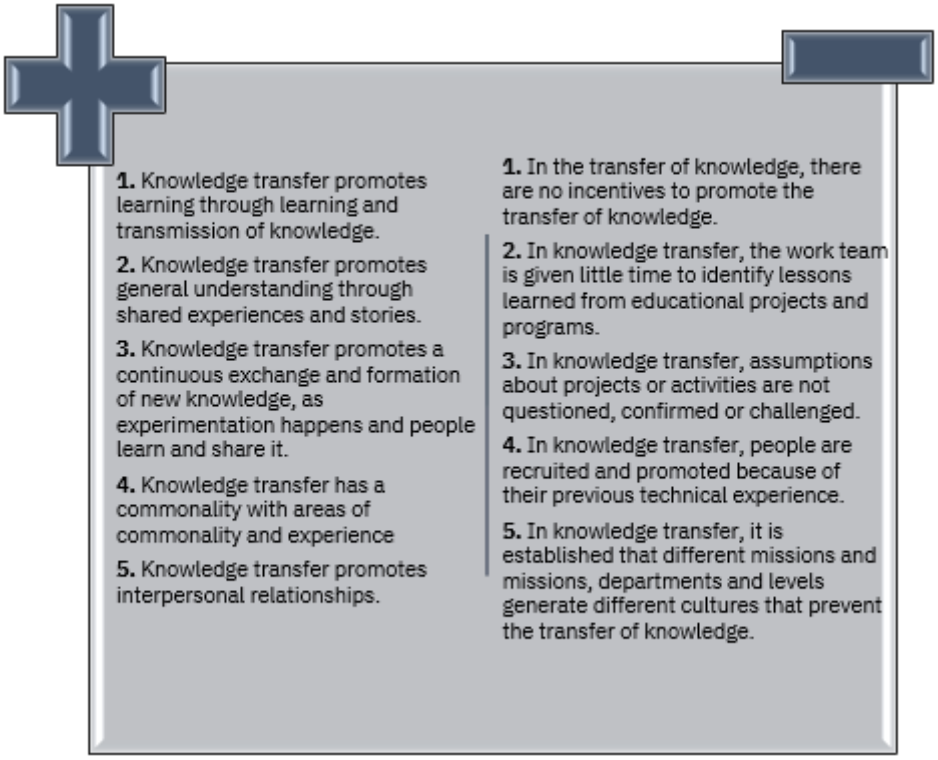
Figure 1.
Davenport's (1996) ten principles of knowledge management.



Source: Own elaboration based on Larrea Abásolo (2008).

O'Dell & Grayson, (1998) cited by Larrea Abásolo, (2008) proposed the following comparative distribution between a culture that promotes knowledge transmission and one that does not promote knowledge:

Figure 2.
Pro vs Non-pro culture from O'Dell & Grayson (1998).

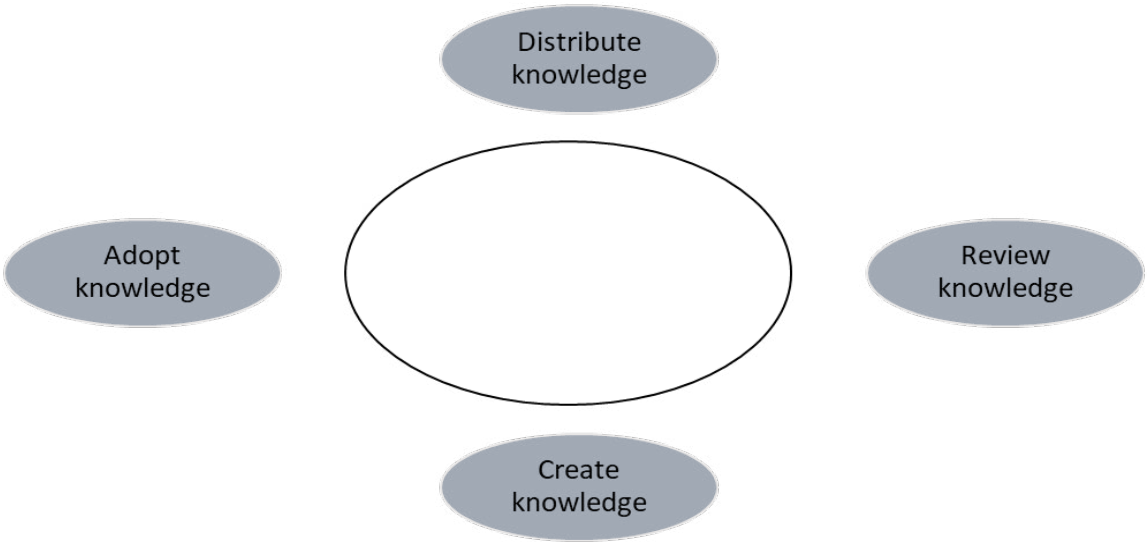


Source: Own elaboration based on Larrea Abásolo (200)[sic].

Authors such as Rodríguez Castellanos et al. (2001), state that knowledge management can be understood as "the planning, organization, coordination and control of the activities that lead to the capture, creation and dissemination of knowledge in the company or other type of organization in an efficient manner". These same authors conclude that in the midst of the search for a unified or general theory of knowledge management, there is an implicit agreement that the process is circular and spiral, because it consists of some sub-processes, as shown in Figure 3.

To understand the relevance of managing knowledge in the progress of any organizational strategy, it is necessary to understand the approach to resources and capabilities. This theoretical approach to resources and capabilities is a valuable instrument that facilitates the determination of strengths and weaknesses internally in an organization, which is why the resources and capabilities that an orga-

Figure 3.
The basic processes of knowledge in an organization.



Source Bahtt (2000). Taken from: Rodriguez Castellanos et al. (2001)

nization has is what allows the exploration of capabilities and the neutralization of threats, but this is only possible for a very restricted number of organizations, because it is costly and not very accessible in the market. Barney (1997)

The above is complemented by Guerras M & Navas L (1998) who stated that "intangible resources and capabilities are usually based on information and knowledge, so there are no limits to their capacity for use. This allows us to appreciate that at present the value of organizations is related to intangible aspects, more than to tangible ones, and that the former refer to the intellectual capacity that is becoming more important day by day.

This is why knowledge management, as Revilla Gutiérrez (1996) put it "means managing processes of creation, development, dissemination and exploitation of knowledge to gain organizational capacity".

For Vitale Alfonso et al. (2020), it is important because it enhances the organizational structure, making it innovative and efficient; the skills and useful information is transmitted to workers effectively, so that the chance of generating new knowledge is much higher, as well as improving processes, products, and different ways of negotiating for new opportunities.

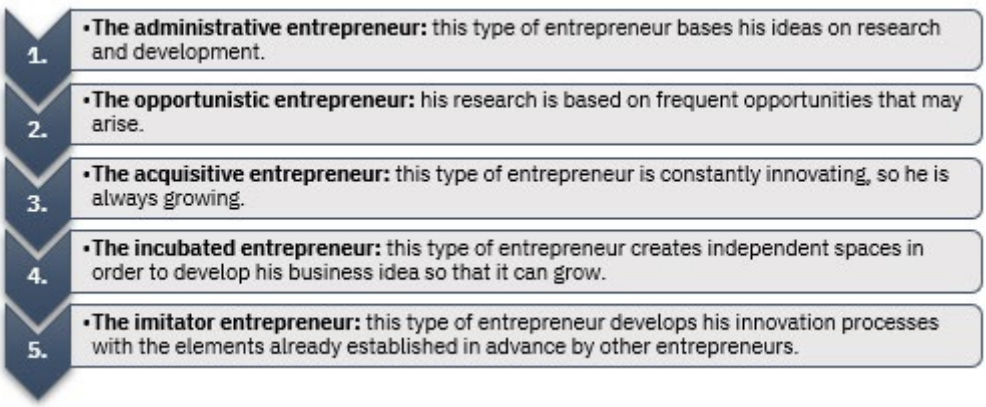
Entrepreneurship

Entrepreneurship in its most generalized and basic definition can be understood as the development of a project that aims at economic, social, personal or any other kind of gain, which in turn has characteristics such as innovation and uncertainty. Kundel (1991) cited by Formichella (2004) defines this activity as the management of a radical and discontinuous change, a strategic renewal, in which it does not matter whether such renewal is internal or external, nor does it matter whether or not it gives rise to new business or business ideas.

Duarte Cueva (2007) establishes that the entrepreneur is any person who individually or as a group creates business ideas, understanding that this is feasible when it is innovative and responds to a need in a creative and hitherto non-existent way. For Andy Freire (2004), the entrepreneur is the person who sees an opportunity and based on it develops an organization, acquires it or is part of a group that acquires it. These definitions allow us to understand that the entrepreneur is the person capable of detecting a business opportunity or project because of a need that has not been solved efficiently. Therefore, the entrepreneur is the idea or project that will respond to this need and will take advantage of this opportunity to profit and/or achieve its objectives.

There are several types of entrepreneurs, but Alcaraz (2011) cited by Cozarit León & Palma Esquer (2016) defines 5 main personalities:

Figure 4:
Types of entrepreneurs.



Source: own elaboration based on Cozarit León & Palma Esquer (2016).

Each of these types of entrepreneurs described in Figure 4, need skills and abilities to be able to carry out their business ideas or projects. That is why Rockerfeller (2006) cited by Cozarit León & Palma Esquer (2016) establishes that entrepreneurial ability is the potential that an individual possesses and that this, in turn, is a set of skills and knowledge that allows a person to develop the activities that will allow them to successfully develop their entrepreneurship.

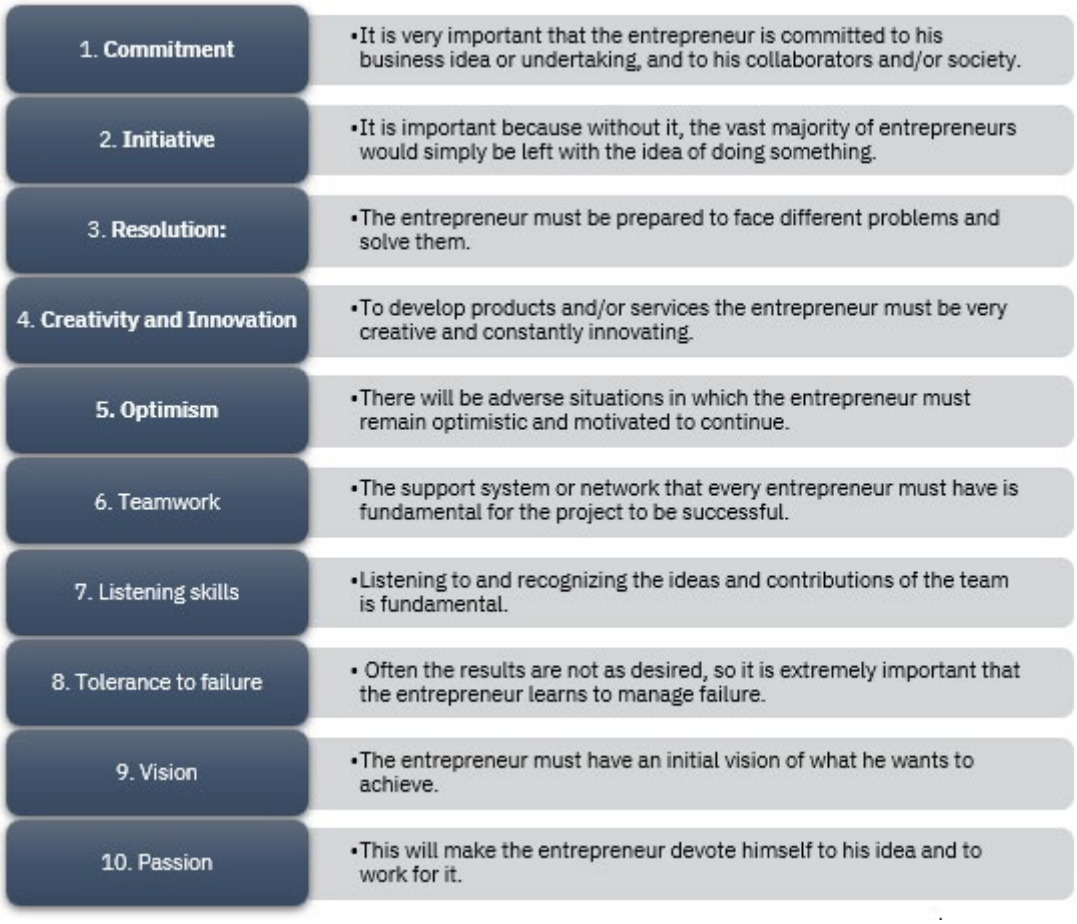
Likewise, Sánchez (2014) quoted by Cozarit León & Palma Esquer (2016), defines entrepreneurial skills as "capacity or ability to carry out some tasks efficiently and effectively".

Figure 5:
Entrepreneurial skills and abilities.

Source: own elaboration based on Cozarit León & Palma Esquer (2016).

There are 10 main characteristics that allow entrepreneurs to achieve their goals and make their ideas successful, benefiting them and all those who are part of their entrepreneurship:

Figure 6.
Characteristics of the entrepreneur.



Source: Own elaboration based on Pérez Paredes and others (2020).

University entrepreneurship

Entrepreneurship itself is an engine of the economy, regardless of the context in which it is developed, it becomes a challenge for those who want to become entrepreneurs, but it is they, the entrepreneurs, who generate jobs, move the economy and promote paradigm shifts, because they are responsible for dreaming of a world and an economy different from the one already established (Loor Mendoza, 2022).

There are many studies that establish that the entrepreneur is born and not made (Zhang, 2009 cited in Arias-Arciniega et al., 2020), there are others that direct their efforts to the understanding of learning to generate entrepreneurship by

university students (Soria, 2016 cited in Arias-Arciniega et al., 2020) that is based on tastes, contexts, interests and culture (Bandera, 2018 cited in Arias-Arciniega et al., 2020). The above establishes that there are many researchers who have focused their resources on the study of entrepreneurship learning in the university environment, with the objective that this population is able to generate entrepreneurship and with it work and significant contributions to the economy.

Therefore, for authors such as Bienkowska & Klofsten (2012), university entrepreneurship was born with the objective of including universities in the economic development of the regions in a more extensive way. This has led universities to establish a role and status in the development and promotion of the entrepreneurial culture, which is why, although it is more common for them to focus on business creation than on the competencies, skills and abilities of entrepreneurs. (Arias-Arciniega, Villegas López, López Tovar, & Echavarría Cuervo, 2020)

For Juliá (2013) entrepreneurship based on innovation and knowledge, is and will be a high-quality entrepreneurship, which will favor local, national and global economies to be truly competitive, something that will bring with it the generation of more jobs, which is why this type of competitive and quality entrepreneurship is the one that should be promoted from universities.

Knowledge management

Artificial intelligence (AI) has been radically transforming the way we manage knowledge, especially in institutional and organizational environments. This transformation, although it brings many innovative opportunities, also poses quite complex challenges, especially if we talk about the ethics and responsibility involved in its implementation. Zambrano (2022) says that although AI has been very beneficial in areas such as health, food and other key sectors, it can also generate very negative effects, such as in armed conflicts or when personal information is misused. That is why it becomes urgent to reflect on how we use these technologies and think about how they can be regulated in a fair way.

Figures such as Pope Francis or Vladimir Putin have shown their concern about the possible negative effects of AI, and it is no wonder, because we are already seeing debates about how robotics should work and what role machine ethics play in this context. Therefore, from the academic point of view, it is essential that universities begin to include more spaces in their curricula where ethics and technol-

ogy are taught, because the coming generations must be prepared to make responsible decisions in an increasingly automated and complex world.

The impact of AI is also beginning to be felt strongly in the field of education, since we are talking about a transition towards what is known as education 3.0, which blends technological advances, neuroscience and psychology to improve the teaching-learning processes. It is a stage that redefines the role of educational institutions, and although its benefits are clear, such as the development of critical thinking and peer-to-peer collaboration, very serious questions also arise: how to regulate its use, how to detect possible biases in the algorithms, and whether there should be a global code of ethics to guide its implementation.

In that sense, as Zambrano (2022) says, AI cannot be seen only as a cold tool, but as a phenomenon that forces us to think about issues such as autonomy, accountability and respect for human rights. Integrating this tool without an ethical basis would be a mistake, because technology alone does not guarantee good use; what does guarantee it is the human judgment behind it.

Beyond education, the risks of AI also affect other global scenarios such as international security and politics. We are seeing more and more news of cyberattacks, information theft and even autonomous weapons that could increase tensions between countries. According to Zambrano (2022) the use of AI in driverless vehicles, military drones and other dangerous applications can lead to very serious consequences. This makes it clear that more robust global regulation and stronger ethical education is needed to help us use these technologies responsibly and humanely. Because yes, AI is moving fast, but ethics and collective conscience must move just as fast, lest we end up creating something we can't control.

Artificial intelligence in education

AI has become a key factor within the educational system, as it has allowed personalizing learning and improving certain processes within the classroom. González, Baren and Zapata (2023) state that these technologies help to better identify the needs of each student, adapting content to their abilities, which allows not only a more effective education, but also a more inclusive one. At the same time, these tools serve to automate repetitive tasks such as evaluation or analysis of results, which gives teachers more time to focus on pedagogical issues.

But it must also be said that AI is not only changing how we teach, but also what we teach. It is now important to train students not only in technical aspects, but also in the critical and ethical use of these tools. According to González et al. (2023) training in technological skills must go beyond the instrumental and address the ethical, social and economic implications that come with the use of these tools, because it is not only about knowing how to use them, but also about knowing when and for what purpose.

However, all this comes with challenges, which is why González, Baren and Zapata (2023) warn that there is still a marked digital divide between different regions, and that excessive dependence on technology can be a risk if there is not a balanced approach. Added to this is the need to protect students' personal data, and to prepare teachers not only to handle these tools but also to integrate them properly into their classes. That is why it is said that AI should not replace the teacher, but complement his or her work and make it more human, not less.

Uses of artificial intelligence in university entrepreneurship

Figueroa and Barreto (2024) point out that these tools have made it possible to further personalize learning and facilitate access to knowledge, enabling universities to better adapt to the needs of the 21st century. Interaction between students and teachers has improved through intelligent systems that organize and optimize knowledge, and this not only raises the quality of education, but also makes more efficient use of available resources.

In addition, AI makes it possible to analyze large amounts of information, which helps to make more informed academic decisions that impact curriculum design, educational policies, and allows for better measurement of student performance. This in turn translates into improvements that benefit both students and institutions. Figueroa and Barreto (2024) insist that these technologies can also change the way assessment is done, providing faster and more personalized feedback, which can help close learning gaps.

But not everything is positive, there are also major challenges that must be faced responsibly: privacy, unequal access, possible displacement of the teaching role, among others. And while it is true that AI has enormous potential to improve university education, it all depends on how it is used. Therefore, Figueroa and Barreto (2024) conclude that, despite the difficulties, if an ethical approach is maintained

and all stakeholders are listened to, these tools can positively transform higher education, making it more humane, more inclusive and more prepared for the future.

Conclusions

Universities have the duty and commitment to educate their students for entrepreneurship, more specifically as Bornstein (2009) states, business entrepreneurship, understood in a broad sense and not only in the sense of creating companies as the main element, but from the development of skills, abilities and competencies that allow students to develop ideas and projects that allow them to take advantage of opportunities to compete in a dynamic and demanding market.

This requires a constant effort of private and public universities to have a much broader vision in their contents to teach about entrepreneurship, because creating a company is as important as having, developing, and enhancing the skills and abilities necessary to participate competitively with such entrepreneurship.

While it is true that entrepreneurship has an economic characteristic and that the main reason why a person undertakes is the desire to generate wealth and employment, it is a key element in the dynamics of the current economy, in which university students are the most suitable to participate, due to the access they have to knowledge, the tools to manage it and the initiatives that are developed so that every day more and more people decide to undertake because they have all the skills and tools that allow them to succeed.

This approach requires both public and private universities to adopt a broader and more strategic vision of entrepreneurship-related content, incorporating AI as a fundamental tool for strengthening entrepreneurial competencies. It is not only a matter of fostering the creation of companies, but also of ensuring that future entrepreneurs possess the necessary skills to compete effectively in demanding markets, using advanced technologies to innovate in products, services and business models. The ability of universities to integrate these technologies into their academic programs not only increases the employability of their graduates but also fosters a culture of innovation that drives economic and social development, aligning with the goals of sustainability and progress.

In conclusion, the combination of artificial intelligence and entrepreneurship education represents an unprecedented opportunity to train students capable of

generating value in a globalized and dynamic economy. Although entrepreneurship has a fundamental economic dimension, its impact transcends this sphere by becoming a key driver for social and technological development. University students, having access to advanced knowledge and cutting-edge tools, are in a privileged position to lead this transformation, provided that educational institutions take on the challenge of offering a comprehensive training that includes both the creation of companies and the development of entrepreneurial skills necessary to ensure success in an increasingly globalized environment.

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