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SUSTAINABLE DEVELOPMENT AND SCIENTIFIC RESEARCH IN UNIVERSITY-BUSINESS RELATIONS: CHALLENGES AND CONTRADICTIONS ANGOLAN CONTEXT

Roberto Cruz Acosta
Instituto Superior Politécnico Maravilla de Benguela (Angola)
cubaneox72@gmail.com · https://orcid.org/0000-0002-7282-8857
Enrique Gabriel Gómez Llata Cázares
Universidad de las Américas (Mexico)
egomezllata@gmail.com · https://orcid.org/0000-0003-4493-2830

Abstract: This study shows the importance of the link between the university and the company, with the aim of analyzing the capacity to generate knowledge, through research, technological development and innovation in the process of knowledge transfer in the construction of a sustainable development model. An exhaustive review of the literature is carried out following the qualitative documentary method. Several national and international authors were consulted and even national educational plans and programs, an exploratory-descriptive investigation was carried out. Based on the results, we focus on the importance of linkage to achieve sustainable economic, political and social development for a country that is fighting against poverty and development, such as Angola. Proposing policies and strategies to link University-Business-Government are proposed. In the Angolan context, the challenges associated with the asymmetries of economic and political power that characterize our era are faced. The effort here implies a concentration on those issues of sustainable development in which it can play an important role in linking scientific research focused on renewed efforts. , interdisciplinary relevant to university policies and strategies in research issues, identifying strengths and weaknesses, stimulating the research process, generating scientific criteria and thought, managing to form the research habit and culture, as well as giving personal value to the work done and serving also as a means of feedback to the scientific community. applicable to Research, Development and Innovation (R + D + I).

Key words: Sustainable development; Research; Development and Innovation; university-business relationship; policy and strategies.

DESARROLLO SUSTENTABLE Y LA INVESTIGACIÓN CIENTÍFICA EN LAS RELACIONES UNIVERSIDADES-EMPRESA: RETOS Y CONTRADICCIONES EN EL CONTEXTO ANGOLANO

Resumen. Este estudio muestra la importancia que tiene la vinculación universidad empresa para el desarrollo de proyectos y programas estratégicos, encaminados a la construcción de un modelo de progreso sostenible. Tiene como objetivo analizar la capacidad de generar conocimiento, a través de la investigación científica, y de poder transmitirlo entre los diferentes agentes económicos y sociales que intervienen en los procesos de producción, distribución y consumo, en el contexto angolano. Para ello se realizó una revisión exhaustiva de la literatura, se consultaron varios autores nacionales e internacionales, así como planes y programas educativos autóctonos, para lo que se efectuó una investigación de carácter exploratorio-descriptivo. Con base en los resultados, nos centramos en la importancia de la vinculación para el logro de un desarrollo económico, político y social sostenible, para un país que lucha contra la pobreza y por el desarrollo, como es Angola. Se proponen políticas y estrategias facilitadoras de vinculación universidad-empresa-gobierno. En este país, se enfrentan los desafíos asociados a las asimetrías de poder económico y político que caracterizan nuestra era; el esfuerzo aquí implica una concentración en aquellos temas del desarrollo sostenible, en los cuales puede jugar un papel importante vincular la investigación científica enfocada a esfuerzos renovados, interdisciplinarios relevantes, a las políticas y estrategias universitarias en cuestiones de investigación, identificando fortalezas y debilidades, estimulando el proceso de investigación, generando criterio y pensamiento científico, logrando formar el hábito y cultura de investigación, así como otorgar valoración personal al trabajo realizado y sirviendo además como medio de retroalimentación a la comunidad científica, aplicables a la Investigación, Desarrollo e Innovación (I+D+I).

Palabras clave: Desarrollo sostenible; Investigación; Desarrollo e Innovación; vinculación universidad empresa; política y estrategias.

Introduction

The era, which humanity is currently passing, has a large number of problems that urgently requires the activation of knowledge. It is the universities and research centers that are called upon to put into practice their role before society and the knowledge economy since it is urgent to build an intelligent society, which is a great challenge, due to its characteristics because of its cumbersome interconnections, its mutual relations, or its fragilities in common, all of which leads to the imperious need for intelligence when it comes to organizing ourselves.

Teaching and scientific research are part of the role that the University must play in society, taking into account that these results, both for future professionals, research, and projects that go forward within the University and outside it, will impact not only on the economy and politics but also on society and its way of life; therefore, the University has the responsibility, through the creation of knowledge, research, and innovation, to participate in the changes that society demands.

The purpose of higher education is to train citizens capable of developing the communities in which they live, through two of its essential functions: education and research, which enable them to be able to adapt their knowledge to the continuous transformations generated by science and technology.

However, higher education not only has the function of contributing to the nation's progress by providing the technically and intellectually trained labor force required by the productive sector, or to prepare individuals who are potentially the drivers of the country's issues, but also to focus on the formation of suitable human capital, capable of dealing effectively with the processes of change that promote technological, scientific, cultural, and socioeconomic progress of the country (Hanel and Taborga, 1988).

Higher Education Institutions (HEIs) have the duty and the possibility of contributing to the fulfillment of the Sustainable Development Goals (SDGs) since their role and mission within society makes them essential agents to achieve them by training individuals as actors of change, with the knowledge, skills, values, and attitudes required to contribute to this sustainability. These entities are accredited as impartial and reliable factors, which opens the doors to establish agreements and create spaces for cooperation between different actors, being education crucial to achieve this type of development.

The SDGs are a demand of the entire world community, adopted by the United Nations (UN), to eliminate poverty, protecting the planet and human beings, with the goal that, by 2030, humanity will enjoy peace and prosperity. Its integrating influence is recognized since performance in one area will have repercussions and effects on the others; likewise, it is proposed that development must guarantee economic, social, and climatic sustainability in a balanced manner. To achieve them, it is necessary that the technological and financial resources, inventiveness, and knowledge of society, as a whole and in all areas, are in function of their fulfillment (UNDP, 2022).

The 2030 Agenda is known as a global action plan in favor of individuals, the planet, and progress, as a continuation of the United Nations Sustainable Development Goals (SDGs); local and regional governments can influence through the implementation of state policies that raise awareness, the design and implementation of actions in accordance with these goals, so that the elaboration of development plans is, without distinction, seen by the countries as a necessity, where the formation of experienced human capital with strong scientific and technological foundations is taken into account, in addition to the generation of goods and services in accordance with market demands, without losing sight of Porter's (1990) statement, "national prosperity is created, not inherited" (p. 163).

Today, it is certainly known that it is the capacity for innovation that provides the source of wealth that guarantees modern energy resources, new riches, more efficient mechanisms, and cutting-edge production. Namely, depending on the number of investments a nation makes in the field of science and technology, so will be the availability of innovative competence, thanks to which it can assume the great challenges, supported by the standards established to cope in the areas of education, health, transportation, among others (Marcovith, 1991).

The objective sought by this research is to analyze the capacity to generate knowledge that university-business relationships have, through scientific research, based on the mission of higher education to "promote, generate, and disseminate knowledge through research" (Bravo, Illescas and Lara, 2016, p.1) taken to the Angolan context.

This document contains five sections: Introduction, explanation of the Methodology of the study, Theoretical Discussion: literature review where the challenges and contradictions of the university-industry link to generate knowledge, through research, technological development, and innovation in the process of knowledge transfer

in the construction of a sustainable development model in the Angolan context, Results, and, finally, the Conclusions.

Knowledge economy

Peter Drucker (1969), with his text "The Age of Discontinuity," made the term knowledge economy popular, but it was conceptually developed earlier in 1962 by the economist Fritz Machlup. Establishing a suitable environment for the development of business innovation and technology-based entrepreneurship is the fundamental role played by governments to improve competitiveness in a knowledge-based economy; thus, providing public goods, such as scientific knowledge and human resources capable of creating knowledge to achieve the evolution of the economy.

The Knowledge Economy itself does not produce wealth and value through its transformation into information, but by participating in the process of generation or evolution of products and services, these have an added value. It is very important to emphasize that knowledge contains much more than information since it is data collected and processed, usable in all fields, while knowledge involves ways, criteria, methods to face and solve diverse situations and problems, tools or mechanisms, Know-how, Know-who, which also turns into more knowledge with more utility and added value, profitable and measurable for society.

Some definitions of the knowledge economy, such as the one proposed by Brinkley (2006), have been limited to productive sectors characterized by their direct relationship with new technologies and innovation. However, these definitions are insufficient for the analysis that concerns us here since the knowledge economy extends to all productive sectors, in addition to other spheres of society.

The World Bank (WB) defines it as an economy in which knowledge is created, acquired, transmitted, and used more effectively by individuals, businesses, organizations, and communities to foster economic and social development (World Bank, 2003).

Another definition studied is the following:

> Knowledge has always been central to economic growth and the progressive improvement of social welfare. The capacity to invent and innovate, that is, to create new knowledge and new ideas that are then materialized in products, processes, and organizations, has historically fueled development. There have always been effective organizations and institutions for the creation and dissemination of knowledge, from the corporations of the Middle Ages to the large companies of the early 20th century and from the Cistercian abbeys to the royal scientific academies that emerged from the 17th century onward. (David and Forey, 2002, p.1)

The aforementioned authors, when referring to the knowledge economy, consider quantitative change to be more important than qualitative change since the key element is an accelerated increase in the acquisition, generation, collection, and even storage of knowledge, decline of knowledge. In Brinkley's (2006) terms: What we see today is essentially more of the same but operating on a bigger scale and at a faster pace (Ibid., p.5).

It is by far a challenge to define precisely what knowledge economy is since this commodity - knowledge itself - is complex to determine. Hence, it is understandable that there is not a considerable number of definitions, and only a few of them admit of

quantification. It is necessary to accept the absence of, at least, a definition that gathers all the elements referring to the knowledge economy, namely, indistinctly all of them have advantages and disadvantages.

According to the World Bank (2007), the strategy should have knowledge at its core and be guided by four components:

1. The educational base of national education and training:

The workforce must be made up of prepared, trained, and educated individuals with the skills to refine and apply their knowledge effectively.

2. Information access and telecommunications infrastructure:

An adequate and sophisticated information support will make the communication, expansion, and treatment of information and knowledge a more fluid process.

3. The innovation system:

The formation of an effective innovation system includes universities, research centers, consultants, advisors, other institutions, and organizations that produce new knowledge and techniques, appropriate the avalanche of knowledge worldwide and apply it to the new situations and needs of the community. Government investments in innovation, science, and technology should include the entire spectrum of infrastructure and institutional management, starting from the dissemination of basic technologies to the most progressive research tasks.

4. Institutional, governance, and business frameworks:

The system of government that prevails in the country and the economic stimulation it produces must provide the effective use and satisfactory granting of financing, stimulation of the entrepreneurial spirit, and the inventiveness, expansion, and correct application of knowledge.

From this approach, we can determine the importance that the WB gives to knowledge, it is evident that it considers the exchange of knowledge as a vanguard action, as well as the application of innovative solutions. The investment in the improvement of human capital is always relevant, as a guarantee of the possibility of acquiring appropriate skills of their social protection, and that in turn reaches each and every one of the members of the society in which they develop. Hence, it is understood that knowledge is a key factor in the WB's capacity to influence the global development agenda.

The words of Freeman and Pérez (1988) help us to contextualize the above, when they refer to the development of activities in an exhaustive way to insert the knowledge obtained from scientific and technological progress in their materials, services, or productive processes, aimed at the incorporation of value and innovation. Within this pillar is the emergence of updated technologies, complete industries in their boom and bust, financing for infrastructure, changing movements in the global location of major companies, and technology industries, in addition to other transformations in structures such as labor and the organizational make-up of companies.

From all the above, it can be concluded that all the definitions of knowledge economy analyzed converge in two fundamental points, one is the magnitude and intensification of the usefulness of knowledge, and the other is the role it plays in society and the economy.

Method

This research is the result of a thorough review of the literature following the qualitative documentary method. Several national and international authors and even national educational plans and programs were consulted, an exploratory-descriptive research was carried out, with the objective of investigating both HEIs and the productive sector, the capacity to generate knowledge that the University-Company relations have, through research, technological development, and innovation in the process of knowledge transfer in the construction of a sustainable development model in the Angolan context.

University-business relations

In these times, globalization is present and spreads all over the world, causing constant changes and alterations. The university cannot be oblivious to this reality, just as it should not be oblivious to the demands of today's society. Only with a quality education, with a system that promotes and encourages timely and convenient research projects, in line with centrally drawn lines, focused on meeting and responding in a feasible way and aligned with the social demands that arise.

The whole panorama described above, in addition to a variety of adjustment policies adopted by African countries, leads to the analysis of outstanding issues, such as the role of the university and the African business sector in the 21st century. Hence, in addition to the fact that the existing backwardness in comparison with developed countries is a reality, the concern for achieving a strengthened link between two of the most decisive sectors in the development of society, such as, evidently, the university and the business sector, arises.

The primary role of universities is to create science by thinking critically through observation, description, and explanation of the phenomena that occur in nature and society. The university, in addition to training professionals, is also a creator of science that seeks the truth because a university that does not seek the truth ceases to be an academy. A higher education system must have implicit schemes of scientific research, where epistemological practice is exercised around national problems through applied science and discovery through basic science. If science is not developed, science pedagogy will not be developed either.

The university contributes to the scientific knowledge relationship, which is applied in the form of ideas, innovations, patents, research resources, practical problem solving, human resource training, technology, etc. The productive sector provides the relationship with knowledge of a technical nature, financial capacity, and a vast field of research, which requires the support of the university scientist. The meeting place of this selective relationship of cooperation, of a socio-economic nature, is the knowledge market, organized to share and transfer knowledge in a global social environment.

The knowledge market, formed by the University-Company link, connects these systems in the production, consumption, and transfer of knowledge. The achievement of levels of social and economic development typical of advanced economies depends on the capacity to generate knowledge, through research, technological development, and innovation, and to be able to transmit it among the different economic and social agents involved in the processes of production, distribution, and consumption.

The university has, among its functions, the production of knowledge, which has to acquire a new relevance since there is an increasingly higher confluence between

technological development and scientific research. But, of course, this should not be done alone but with the participation of the government, as well as actors and officials from the business sector, together with the so-called science and technology system (Corona, 1994). This coincides with the situation in which the African university is being called upon to be more relevant and sensitive to the needs and demands of the population, at the same time that the industry is under the pressure of an increasingly fierce competition due to the globalized economy and the internationalization of technology, which forces it to assume a pressing position in the face of the accelerated pace of technological evolution.

From the perspective of the university, linkage has a clear purpose, which should be assimilated as the machinery that propitiates research to be of superior quality, together with university teaching, as well as a better identification with the demands of society. Seen from the point of view of the company, the linkage plays a primordial role within the competitive market, through the elevation of the efficiency of processes that strengthen the levels of generation of goods and services on the basis of the technology that has been transmitted by the university, which, in almost all cases, belongs to novel technological creations that propitiate not only a higher quality of the products but also lower costs.

Hence, the linkage between the university and the business sector is a process that is likely to receive stimuli, to the extent that both institutions contribute to a constant development and incentive to achieve the much needed technological and scientific progress that African nations need to face and leave behind poverty and backwardness, something that has not been achieved strongly in the Angolan universities.

Some authors, such as Saavedra (2009) and Martínez Pavés, cited in Moctezuma (1996), agree on the need to build a bridge between the world of research and the productive sector, and this can only occur within the framework of effective cooperation (Saavedra, 2009); an approach that we assume to be very accurate since both sectors must interrelate and create mutual cooperation, from which innovative results can emerge in response to society's needs.

Theodore Shultz, Nobel Laureate in Economics in 1979, (quoted by Grañó, 2015), stated in a clear way that "education is a form of investment, as opposed to those who consider it an expense (...) If we want our society to progress, it is necessary to invest in education" (p.1).

According to Joseph E. Stiglitz (2014), investment in education is one of the greatest concerns of governments, so if a country does not invest in education and does not promote its own industry (other than on the basis of exploiting its natural resources), it will remain stagnant, until, over time, it will end up disappearing. Education has a direct effect on people's lives and on society as a whole. If we want our society to progress, it is necessary to invest in education.

The educational system of a country should be one of the highest priorities for its government, investing in it would be the guarantee of having the necessary professionals to achieve the development it needs; so that the country that does not do so will be condemned to stagnation, over the years it will perish, as is also the case with industry, always preserving its natural resources.

History of University-Business linkage in Angola

During the last decades, Angola showed persistent highs and lows in the university-productive sector linkage, as well as low investment in science, technology,

and innovation in relation to other nations, reflecting the growing decline in the last three federal public governments in the fields of production and application of knowledge.

Notwithstanding the importance and the benefits generated by the linkage of HEIs with companies in society, this form of partnership is still very scarce in Angola, which causes a decrease in the value given to this activity, as well as hinders the initiative to cooperate in this type of projects. The limited transfer capacity of Angolan HEIs makes it difficult for linkage actions to move to a second stage where the transmission of high technology is affirmed, conditioning the development of companies.

We are faced with various situations in which, for example, businessmen consider that universities do not take into account the problems faced by industry; the university is considered to be a promoter of knowledge, but there is no approach in this respect related to industry. The most relevant link that involves the company with the university are the short courses, which are not enough to carry out a strong cooperation activity. In addition, there are difficulties in the field of communication with respect to the companies, showing lack of interest and indifference towards the business sector, pride on the part of researchers, low installed capacity, among others.

It is necessary that the university connects with companies through strategies that allow it to advance towards a better educational quality and that, as a solution to society's problems, from the local to the international level, it is capable of strengthening its structures of institutional and state councils of linkage.

We must be aware that linkage is not a mandate of the government or the rector in turn, but by the will of the university and industry. To achieve linkage, it must be a fundamental part of the linkage units, national diagnosis, linkage networks, etc., to strengthen this chain.

Universities in Angola have not been immune to this trend, particularly since 2004, when the Angolan state urged public universities to seek new ways of obtaining resources to help sustain them. However, the effective results of the various linkage modalities still leave much to be desired and mostly remain in good intentions, in modest investments by the universities, and in revenues that either do not substantially improve the universities' income, or if they do, they are based on activities closer to consultancies and services in which there is no generation of knowledge or knowledge transfer.

We focus on the importance of outreach for the achievement of sustainable economic, political, and social development for a country struggling against poverty and for development such as Angola. To address the new processes, indicators will be established to reflect the extent to which universities have an institutional and normative development that favors linkage activities. This will make it possible to distinguish the university's potential to meet the proposed objectives, as well as to determine the integration actions aimed at the exploitation and use of the university's knowledge and capabilities, and the activities related to the generation of knowledge and the development of skills in the framework of interaction with the non-academic community.

Challenges and contradictions in the Angolan context

The Angolan population is approximately 18.5 million, with the majority residing in urban areas.

Non-oil revenues declined despite fiscal policy and administrative measures to improve and collect taxes, reflecting the economic slowdown. In the political context, Angola has maintained stability since the end of the 27-year civil war in 2002. In 2010, a

constitution established a presidential parliamentary system with the president no longer elected by direct popular vote, but as the leader of the party that won the most seats.

Current President João Lourenço, of the People's Liberation Movement of Angola (MPLA) party, took office in September 2017. Since then, the government devalued the currency, tightened monetary policy, and resumed fiscal consolidation.

The largest spending cuts were implemented in public investments and subsidies. For 2018, the previous budget that fiscal consolidation would depend on wage cuts and investments. Both oil and non-oil revenues have declined more than expenditures and are partly responsible for the slowdown in fiscal consolidation, as shown in Figure 1.

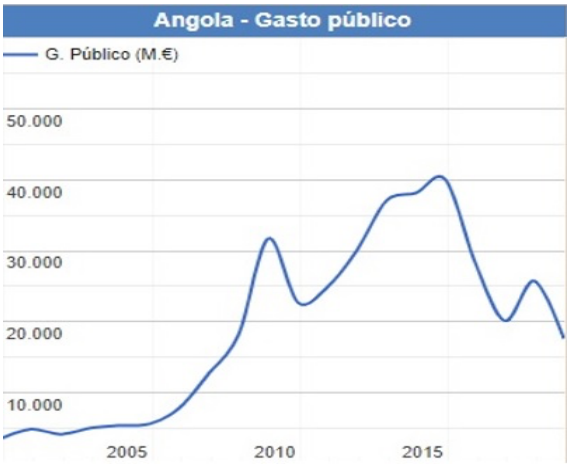

Figure 1. Public Expenditure Ranking Angola 2018

Note: Source: International Monetary Fund, Yearbook of Government Finance Statistics and data files, and World Bank and OECD GDP estimates. Angola.

Among these expenditures are those that could be devoted to investments in education, which greatly limits any progress in scientific research.

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As development challenges, Angola has achieved substantial economic and political progress; however, the country continues to face enormous challenges, including reducing dependence on oil and diversifying the economy, rebuilding infrastructure, increasing institutional capacity, and improving governance and public financial management systems, human development indicators, and living conditions. Significant segments of the population live in poverty, without access to basic services, and the country lacks participatory development policies.

Scientific research in Angola.

According to the National Statistical Institute of Angola, in public higher education, there is only one doctor for every 194 students, while in private higher education there is one doctor for every 526 students. It also points out that only 10% of teachers have a doctorate degree and 33% have a master's degree. These data demonstrate the little progress in scientific categorization achieved by university professors in this country. We believe that it is the work of scientific research that will result in the solution of numerous problems and challenges that Angola faces today and tomorrow.

The SCImago Journal Rank is a measurement factor through which statistical information on the quality of scientific publications can be obtained by counting the number of times each publication has been cited. Thanks to this calculation, it is also possible to obtain weighted data on the relevance and reputation of the journals from which these citations originate. This indicator gives us the possibility of knowing the current state of the country in terms of scientific production.

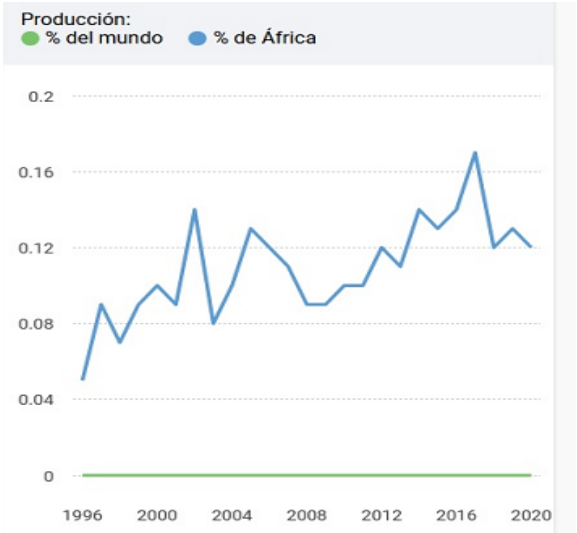

Figure 2. Scientific influence of academic journals on scientific production in Angola and the world.
Note: Source: SCImagoJournal Rank. Angola 2021

As shown in Figure 2, citation references from scientific journals in the region fluctuate indistinctly in an unstable manner, in the range from 1996 to 2014, being largely higher from that year but also experiencing a substantial decrease in 2017, which denotes the low university participation in this activity.

It is evident that the consultation of scientific articles corresponding to indexed journals was not common in previous years, a situation that has now changed. This statistic gives us an idea of the impact of scientific publications, both in the region and in the world, being an important element to take into account when it comes to knowing how scientific research behaves, essentially in Angolan universities.

We adopted the following definition of research, given by Arenas, Toro, and Vidarte (2000) because we consider that it gathers all the necessary elements related to the objectives outlined:

> It is a human activity aimed at obtaining new knowledge and, in this way, occasionally, to solve scientific problems or questions. It is the act of carrying out strategies to discover something. It also refers to the set of intellectual and experimental activities of a systematic nature, with the intention of increasing knowledge on a given subject (p. 87).

By virtue of this definition, we can argue that research is a social process, which goes through stages and moments, resulting in a method for the production of knowledge. It is aimed at answering and providing solutions to problems, situations, and questions that arise, both in the field of knowledge and in the field of doing, from a position of analysis and reflection of the subjects or the theory. It is defined depending on the context in which it is carried out, by individuals, in individual or group exercise.

One of the most pressing issues under investigation is poverty, which is increasing at high rates every day, especially in low-income countries, due to precarious economic conditions as a result of political conflicts, climatic conditions, etc., among which African countries, especially sub-Saharan Africa, stand out.

Michel P. Todaro (1988) points out that "development should be conceived as a multidimensional process involving changes in structures, attitudes, and institutions, as well as the acceleration of economic growth, the reduction of inequality, and the eradication of poverty" (quoted in González, 2006, p. 166).

According to Todaro, all aspects of society must be involved in the achievement of development, providing substantial contributions that revolutionize and transform the existing scenario in each country or community.

Science, technology, and innovation are recognized by the UN as key elements to achieve social economic development, as well as their contribution to the fulfillment of the SDGs. Policy decisions must be based on scientific research and not just be mere inert witnesses, since their influence and performance provide the necessary indicators to know the level of progress of countries and how close they are getting to the SDGs; thus, giving the possibility of rectifying the course.

This is where the university comes into play. Its relationship with companies plays a preponderant role in the transformation of this economic scenario, from its local and regional environment, supported by a legal framework implemented by the Government, which allows it to obtain credits that facilitate the creation of research centers, where the University and the companies can link their active management through advanced projects of social impact.

Results

As a result of this research, the following proposal for Research, Development, and Innovation (R&D&I) policies and strategies is made with the intention of contributing to the process of knowledge transfer in the construction of a sustainable development model in the Angolan context.

- Promote research in all its forms: systematization of knowledge, exploratory studies, formative research, basic research, applied research, among others.
- Promote the insertion of HEIs researchers in the international scientific community through their involvement in international networks and joint work with foreign researchers.
- Prioritize research that: a) falls within the lines of the Research, Development and Innovation Agenda (R&D&I) of the Universities; b) has as its object of study the national reality and/or sub-Saharan Africa; c) may have an impact on the development (technological, economic, environmental, civic-institutional, and psycho-social) of Angola and/or the sub-Saharan Africa region; d) has an interdisciplinary approach; and e) is part of the PhD training process.
- Promote that the different academic units -both undergraduate and graduate- have their own lines of research in accordance with the R&D&I Agenda.
- Promote research competencies at all levels, strengthening and developing human resources of the highest level. In the promotion to academic management positions, as well as in new hires, in addition to considering the best academic level, a

fundamental requirement to be considered will be the experience of the professionals in R&D&I.

- Implement a system to stimulate R&D&I activities through various mechanisms and through academic careers. In particular, when hiring, try to incorporate highly qualified and talented young professionals with experience and research curricula into the academic staff.
- Promote a teaching model that encourages, from the classroom, critical thinking and knowledge generation. In addition, to promote the feedback of teaching with the knowledge obtained from R+D+I activities at the University.
- Facilitate harmonious cooperative relationships between the different R&D&I projects and programs and those with master's degrees and doctorates.
- Increase the publishable intellectual production of researchers, professors, and students as a mechanism for disseminating the results of their work and projects, and to promote the use of publications as teaching support material.
- Seek greater promotion and representation of the intellectual production of University professors in social networks, recognized international platforms, and publications that are part of international indexing systems.
- Seek greater inclusion of articles by foreign academics in the University's periodicals, as well as the inclusion of the University's journals in international databases and catalogs of indexed journals.
- Transmit the results of research and innovation to civil society, the State, international organizations, and the country's private sector in an agile and timely manner, in order to achieve a better impact on society. All research should be shared with groups or actors of society interested in knowing the results of the same.
- Seek better international visibility in the area of innovation by creating alliances with universities, international organizations, innovation networks, international associations, as well as local innovation bodies and environments.
- Promote the production of patents and guarantee the protection of the University's Intellectual Property. A system of Intellectual Property with legal norms and specific regulations will be implemented.
- Favor the transfer of technology to the University and from the University to companies and society. In this sense, strategies will be designed for the transfer of results and dissemination of R&D&I activities.
- Establish mechanisms to attract foreign investment in research and development to facilitate the sustainability of R&D&I projects.
- Establish strategies for obtaining the necessary financial resources for the materialization of these R&D&I policies. The definition of a stable and well-defined budget for R&D&I would represent an enormous step forward in the consolidation of these university functions.
- Promote interdisciplinary programs that have an impact on sustainable economic, social, and human development in the different communities, municipalities, regions, and the country as a whole.
- Take advantage of strategic alliances -linkage to international networks and associations- for the establishment of joint research and innovation projects. Incentives will be provided for research that incorporates an international component.
- In their R+D+I activities, the Universities will promote professional ethics and social responsibility.

Strategies for the Implementation of R&D&I Policies, in order for R&D&I Policies to acquire meaning, they must be expressed in concrete lines of action. The Directorate of Research and Social Projection currently has some valuable instruments of proven effectiveness to promote the development of the R&D&I system.

University policies on research, development, and innovation should not only be congruent in their implementation but also find in them the mechanisms and processes suitable for their realization. The express policy of intellectual production should be linked to the scale of merit of academics and articulated to a system of economic retribution according to intellectual productivity. In the same vein, intellectual property policies (and concrete actions) should be implemented in the universities with clear and expeditious procedures for the processing of patents, industrial models, registration of works, journals, software, and trademarks.

In order to promote the University's research activity in international scientific communities, a work plan will be drawn up with all the academic units of the Universities, in order to provide coherence and greater international projection to the research and innovation activities carried out.

Conclusions

The university-business linkage is a strategy that promotes the transfer of knowledge and technology; however, it is not an easy activity; higher education institutions must understand the importance and urgency of scientific research in terms of sustainable development and not maintain the traditional scheme where the University is only concerned about the future professional to graduate. It is necessary that the linkage with the company begins to play a new role, where universities guarantee the transfer of knowledge in union with the business sector to fulfill the part that corresponds to it, within society and its development.

With this research, it has been possible to demonstrate the importance of the link between the University and the productive sector, where the institutions of higher education in Angola must make important efforts to formalize the activity, where the contracts between other educational institutions, companies, and governments have been insufficient and have not been given a follow-up of their fulfillment, where they must make known to the productive sector the capacities to satisfy the problems in order to be attractive; where it is necessary to expand the generation of knowledge taking into account the new technologies.

Based on the results obtained, the proposal of policies and strategies for Research, Development, and Innovation, R+D+I, are presented, with the intention of contributing to the process of knowledge transfer in the construction of a sustainable development model in the Angolan context.

References

Arenas, B., Toro, D. y Vidarte, J. A. (2000). Concepto de Investigación. *Ánfora: Revista Científica de la Universidad Autónoma de Manizales 8*(15), 87-90. https://dialnet.unirioja.es/descarga/articulo/6138488.pdf

Banco Mundial. (1990). *World Development Report 1990: Poverty*. Washington DC. http://documents.worldbank.org/curated/en/424631468163162670/pdf/PUB85070REPLACEMENT0WDR01990.pdf

Bravo, G.; Illescas, S. y Lara, L. M. (2016). El desarrollo de las habilidades de investigación en los estudiantes universitarios. Una necesidad para la formación de investigadores. *Revista de Cooperación, 10*. https://www.revistadecooperacion.com/numero10/010-03.pdf

Brinkley, I. (2006). *Defining the knowledge economy*. The Work Foundation, research paper. https://www.igi-global.com/dictionary/indigenous-knowledges-and-knowledge-codification-in-the-knowledge-economy/16327

Corona, L. (1994). La universidad ante la innovación tecnológica. In M. Á. Campos y L. Corona (Coords.), *Universidad y vinculación. Nuevos retos y viejos problemas* (pp. 123-138). Universidad Nacional Autónoma de México. http://www.scielo.org.mx/scielo.php?script=sci_nlinks&ref=5765090&pid=S1607-40412005000200005000005&lng=es

David, P. y Foray, D. (2002). Fundamentos económicos de la sociedad del conocimiento. *Comercio Exterior*, *52* (4), 72-490. http://fcaenlinea.unam.mx/anexos/1141/1141_u5_act3.pdf

Drucker, P. F. (1969). *Landmarks of tomorrow: A report on the new "post-modern" world*. Transaction. https://books.google.co.ao/books/about/Landmarks_of_Tomorrow.html?id=AzEDmQEACAAJ&redir_esc=y

Freeman, C. y Pérez, C. (1988). Structural crises of adjustment: business cycles and investment behaviour. En G, Dosi et al., (Eds.), *Technical Change and Economic Theory*. Columbia Univesity press. http://www.carlotaperez.org/downloads/pubs/StructuralCrisesOfAdjustment.pdf

González Arencibia, M. (2006). *Una gráfica de la Teoría del Desarrollo. Del conocimiento al desarrollo humano sostenible.* Universidad de Málaga. http://www.eumed.net/libros/2006/mga-des//

Grañó. M. (2015). *Invertir en educación, 5 motivos de peso.* Keiser University https://ined21.com/5-motivos-para-invertir-en-educacion/

Hanel y Taborga, H. (1988). Algunas consideraciones sobre la educación superior, *Revista de la Educación Superior, 17*, 124-130. http://publicaciones.anuies.mx/revista/68/4/2/es/algunas-consideraciones-sobre-la-educacion-superior

Joseph E. et al. (2004). *Creating a Learning Society. A New Approach to Growth, Development, and Social Progress*. Columbia University Press. www.jstor.org/stable/10.7312/stig15214.1. Accessed 28 Apr. 2020.

Marcovitch, J. (1991). Gestión tecnológica en la empresa y desarrollo. In *Camino moderno al desarrollo. El rol de la gestión tecnológica. Santiago de Chile*. Centro Interuniversitario de Desarrollo, CINDA, (pp. 21-41). http://publicaciones.anuies.mx/biblioteca-cises/1016/camino-moderno-al-desarrollo-el-rol-de-la-gestion-tecnologica

Martínez Pavez, C. (1993). *Universidad-Sector Productivo, nuevas formas de vinculación, parques tecnológicos e incubadoras*. Cinda, Santiago de Chile. http://publicaciones.anuies.mx/pdfs/revista/Revista97_S4A1ES.pdf

Moctezuma, P. (1996). Universidad sector productivo, nuevas formas de vinculación, parques tecnológicos e incubadoras. *ANUIES*, *97*, http://publicaciones.anuies.mx/pdfs/revista/Revista97_S4A1ES.pdf

PNUD. (2022). *Programa de las Naciones Unidas para el Desarrollo. ODS en acción*. https://www.undp.org/es/sustainable-development-goals

Porter, M. E. (1990). ¿Dónde radica la ventaja competitiva de las naciones? In *President and Fellows Conference*. Harvard College. https://dialnet.unirioja.es/servlet/articulo?codigo=63466

Saavedra, M. (2009). Problemática y desafíos actuales de la vinculación universidad empresa: El caso mexicano. *Faces*, *19*, 100-119. https://biblat.unam.mx/es/revista/actualidad-contable-faces/articulo/problematica-y-desafios-actuales-de-la-vinculacion-universidad-empresa-el-caso-mexicano

SCImago. (2019). *Journal Rank.* https://www.scimagojr.com/journalrank.php?country=IL

Stiglitz, J. E., (2014). *Inequality, Wealth, and Growth: Why Capitalism is Failing.* https://www.mediatheque.lindau-nobel.org/videos/33963/joseph-stiglitz/meeting-2014-eco

Todaro, M. P. (1988). El significado del desarrollo y sus diversas teorías explicativas. *El desarrollo económico del Tercer Mundo*. (pp. 93-140.) Alianza Universidad Textos. https://www.abebooks.co.uk/desarrollo-econ%C3%B3mico-Tercer-Mundo-Todaro-Michael/22522592240/bd

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