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Public policies to control boldness and prudence in science, technology and innovation

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SUMMAR Y

Introduction: science and technology have penetrated and shaped every sphere of life, so we are obliged to look for alternatives for their strengthening and control. **Objectives:** to value public policies to the control of audacity and prudence in science, technology and innovation. **Method:** an analytical investigation was carried out using methods of the theoretical order, starting from the materialistic dialectic, as the rector of scientific research: of the total of the references found 15 bibliographic references that met the selection criteria were consulted. It was used as a method of the theoretical level: analytical-synthetic and inductive-deductive. **Development:** in the interest of encouraging the development of scientific and technological research for social objectives, the government applies a series of measures that regulate prudence and fearlessness to apply knowledge. Innovation opens the way to increase the capacity to produce and use the relevant knowledge of each State, but it is not exempt from indispensable accelerations and judicious regulations. The problems that Cuba faces for the scientific impulse are dissimilar, but a Critical stance shows us that there are issues that are in our hands to stop slowing down development. **Conclusions:** it is necessary to be involved in the improvement of policies that regulate scientific progress and determine the advantages and probabilities of solving current problems of society.

Keywords: Science; Knowledge; Government; Innovation; Scientific-Technological Research; Public Policies.

SUMMARY

Introduction: science and technology have shaped and shaped every sphere of life, so we are obliged to look for alternatives to strengthen and control them. Objectives: assess public policies to control audacity and prudence in science, technology and innovation. Method: an analytical investigation was carried out using methods of the theoretical order, starting from the materialistic dialectic, as the guiding force of scientific research: of the total of the references found,

15 bibliographic references that with the selection criteria were consulted. It was used as a method of the theoretical level: analytical-synthetic and inductive- deductive. Development: with the interest of promoting the development of scientific and technological research for social objectives, the government applies a series of measures that regulate caution and fearlessness to apply knowledge. Innovation makes its way to increase the capacity to produce and use the relevant knowledge of each State, but it is not exempt from indispensable accelerations and judicious regulations. The problems that Cuba faces for the scientific impulse are dissimilar, but a critical stance shows us that there are issues that are in our hands so that they stop holding back development. Conclusions: it is necessary to get involved in the improvement of the policies that regulate scientific progress and determine the facilities and probabilities of solving current problems in society.

Keywords: Science; Knowledge; Government; Innovation; Scientific-Technological Research; Public politics.

I. INTRODUCTION

Today's world, and the way things proceed, is very different from years ago. Rain is no longer the only source capable of making plantations grow and bear fruit, and the climate and soils do not become such a serious obstacle to this same objective; now dams are built, reservoirs are made, greenhouses are created, artificial rain, fertilizers, herbicides, maturation techniques. Diseasessuch as tuberculosis, chickenpox, diabetes, no longer put a seal of death, because treatments and drugs have been developed to combat them, preventive vaccines have been developed and others that help strengthen the immune system of o rganismo; there is no longer any need for years to go by without seeing or hearing from a family member or friend who lives far away, as the transport and communications sector is they have developed incredibly. As the Doctor of Science Jorge Núñez Jover said, "Yesterday we had to colonize territories to access new sources of raw materials and food crops; today it is not necessary to undertake the material conquest of new lands, the civilization of the immaterial allows producers and consumers to be subjected to the coded formulas of a laboratory and the algorithms of the 'fabric' of the Internet" [1]. The basis of this society is the conception of new knowledge, the dissatisfaction of man and knowledge, his need to find answers, novel solutions to existing problems; that is, it arises as a result of the moment in which man began to look beyond the everyday, and was forced to innovate. We are living in the so-called "knowledge society", where information, science and technology have permeated every sphere of life and have become essential to everyday life. So we are obliged to look for alternatives for its control. Herein lies the great paradoxical problem of regulations in science, technology and innovation,

Boldness or prudence? know how to decide when boldness should be prioritized over prudence in science processes.

As far as our daily lives are concerned, we have no doubt that prudence must be a global principle that we must not overlook. But that global principle in no way means that the impulse is not necessary in the conjunctures of crisis or that boldness and risks are not required to make circumstances more favorable. It is also necessary to ***promote the moral principle*** according ***to which the means must be parallel with the ends,*** although the complex conception of the loop between ends and means it has shown us that, in extreme cases, not so prudent and accepted means become indispensable to save us from the worst.

Precisely this report includes how the government of a State in order to promote the development of scientific research, or the use of science and technology for social objectives and General policies, applies a series of measures that become public policies that regulate prudence and courage to exercise knowledge, justify and financially encourage this scientific activity and its implications.

But any scientific policy that the government of a State assumes, has as a background a type of Science Policy, which is linked to the hegemonic scientific culture that sustains that modality of paradigm or way of seeing science.

Valuing public policies to the control of austerity and prudence in science, technology and innovation, especially in Cuba, is the objective of this analysis, which tries to transport us to the field of reflection.

METHODS: s e carriedout an analytical research in the period of June 2021, using a set of theoretical methods (analytical-synthetic and inductive-deductive and documentary review), based on the materialist dialectical method, as the rector of the methodology of scientific research: of the total references found 15 bibliographic references that met the selection criteria were consulted, the descriptions used for the search were: "public policies in science", "innovation in the news ", "science, technology and innovation in Cuba".

II. DEVELOPMENT

A. Innovation and its components

Innovation has been key to achieving the development and lifestyle of these times and continue to be to reach new frontiers, they are processes that introduce firsts, new proposals, inventions, significant changes in the product or in its way of obtaining or organizing with the purpose of improving results. In a strict sense, ideas can only result in innovations, if thanks to them new products, services or procedures are implemented that really find a successful application, imposing itself on the market through dissemination.

There are certain components that are basic that determine a successful innovation. In the first place, we must always bear in mind that any innovation process must follow different stages, which does not last a day, weeks, or even months, rather they are ideas projected in the medium or long term; In addition, there is no innovative project that has not gone through research, design and production work before, that is, planning work.

Normally it is not an isolated action, but involves a group, teamwork and even a multidisciplinary and interdepartmental team, which share a vision of where you want to go and what are the conceptions and educational principles that you want to promote. It also has to do with processes that facilitate understanding, planning, action and joint reflection on what you want to do and how.

You must have a high degree of adaptability to the context, because finally it is there where your impact will be reflected; if the impact is only punctual, it will not go from being a good resource or a specific solution, but, if, on the other hand, it is able to generate a before and after in its sector or scenario,we can talk aboutan innovative idea.

Innovative projects are not subject to universal laws, but constitute an invented reality that depends on the meanings and intentions of the internal actors, who are open to learningand are able to face and solve new approaches and learn from the own experience of others, question it, recover it and originate knowledge to transfer it to their practices and thus break inertia, barriers and fears. Of course, something that must be available is resources; it is almost impossible to apply an innovation if the necessary infrastructures for its implementation are not allocated; here the financing and investmentof the State in question in this sector plays a fundamental role.

The world is constantly changing, due to globalization and the transformation of the culture of society; so we must respond to new processes technological, before the criteria, quality indicators and before the possibility of offering what society requires.

You have to be aware of all movements in order to stay out of everything and thus become updated and be able to respond adequately to the demands of the community. It is necessary to have an analysis of the internal and external environment to know where we stand and know where to walk with the greatest possible certainty.

There is no formula or model to followfor an institution that is successful today to remain so in three or more years. Innovation is a key factor and must be worked on daily and permanently. It is necessary to be aware, evaluate the management process, identify the key and critical factorsof success or failure, and then start from there to be able to innovate, improve, do more with less, and achieve excellence.

But there is something that is extremely essential in this process, and that is that, as explained before, very rarely innovation is given by a single person, even if the new novel idea that you want to put into practice, has been one's idea, to carry it out you need a team that supports him and, helps him to put it into practice and to see ways to improve it, and prevent possible failures, even more so in this advanced society where things out of the ordinary and impactful come from the hand of the union of different disciplines, and, of course, this has to transcend in time and enter the market, so that others can take advantage of it, and thus gain value (whether other sectors or even other countries). It is therefore necessary for a transfer of technology and knowledge.

Technology transfer consists of the transfer of skills, technologies, as well as knowledge between organizations; its purpose is the continuous transfer of technological advances that promote development. These transfers occur so that another series of organizations with fewer resources can access scientific advances in an easier and more accessible way. In this way, they allow technological development, as well as the creation of value in their products and services. At the same time, they are great generators of competitiveness.

Habitually Large Generators of this transfer sound the government the centres of research y the universities. His principal objective it the betweennsferencia of knowledge group of Activities Directed a the diffusion of knowledge, experiences and skills in order to facilitate the use, application and exploitation of the knowledge and skills in R&D, either for other R&D institutions, the productive sector or the society in general.

The transfer of knowledge is a way in which the scientific community participates and imentawith its investigations to the processes of public policy; many have expressed concern about the use of knowledge in the development of problem-oriented policies and in boosting the prosperity of societies.

We live immersed in a world of increasingly sophisticated goods and services, but if the strength of this process comes only from the market and the interest of companies, it is unlikely that social imbalances tend to diminish, but rather the opposite; guaranteeing equity in the distribution of wealth and access to the minimum necessary goods and services (health, education, housing, among others) presupposes the existence of governments and social actors with the capacity To realize something similar to what was once called the "welfare state" [2].

Hence, there is a close relationship between science and power (i.e. politics), even more so when after the emergence of post-industrial society politics was impregnated with all the problems of society, and began to intercede in almost all spheres of life as the one in charge of establishing order. It then came to what was knownas totalitarianpolitics, which had to sustain all aspects of life in society as the one that had the solution to every problem that was presented.

However, problems and weaknesses began to develop in this way of thinkingand acting, because politics was emptied of big ideas, for the benefit of economic objectives that became priorities: currency stability, growth rates, trade balance. external, productivity of companies, competitiveness in the international market [3], and began to neglect and leave aside basic problems. It was necessary to acquire an anthropological character, which analyzed in a multidimensional way specificsituations that were affecting the daily social life (without becoming totalitarian), and that was aware of the fundamental and what is really important, recognizing and respecting that there are things that are not in your hand.

Unfortunately, today we are still struggling to achieve this conscious policy, but it has not been achieved; the benefits brought by progress and technology have overshadowed many worrying situations that are manifested with increasing force. "Inote that the profound incapacity of these times of development is that they are based solely on quantification, calculation, and consider human well-being only in quantitative terms and monetarized.

You don't see the problems of the qualities of life, and the very quality of life, which escape the quantification (...). There is today in our societies a very good mentality to control and to know the artificial machines, but that does not serve to control and to know human beings. Because knowledge that is based solely on quantification and calculation cannot know what life means, that is, passion, love, suffering, all the subjective traits of humanity.

Quantitative objectivity does not know the real, it knows only the superficial part of the real (...), we can say that we are in a planetary Titanic, with its technical, scientific, economic and profit 'quadrimotor', but not ethically and politically controlled" [4].

According to various analysts of the subject, this society is dominated by the basic principles of capitalism, the privatization of knowledge is promoted and the capitalization of the various activities linked to higher education, research and its applications is encouraged. This privatization hinders the use of advanced knowledge to improve the quality of life of the poorest [5], so social inequalities are reproduced, taking into account that the basic principles of advanced societies are still the accumulation of capital and that it is intended to subject the generation and use of knowledge to the rules of the market.

Due to this situation, today we are trying to achieve what is called a Sustainable Development (SD) as an alternative to current development, emphasizing the reconciliation between economic well-being, natural resources and society, avoiding compromising the possibility of life in the planet and the quality of human life. To do this, it is necessary to take into account and understand various issues, firstly, that economic inequality is one of the aspects that enhance the great inequalitythatexists today, between countries, and within them, aggravating the levels of poverty, something that is first and foremost a matter of social justice, and which must be treated with the highest priority. But, to do this, we must stop paying attention only to the inequalities linked to the economic sphere, and see and analyze them as a whole and the interaction between them: economic, social, cultural, political, territorial, cognitive and knowledge. To all this, the problems related to population aging, the quality of education, health, conflicts, violence, threats to peace, the world economy, pollution, disasters that are occurring due to changes are also included. climate, say sequias, floods, earthquakes, tornadoes, storms, heavy snowfall, among others.

The Sustainable Development Goals (SDGs) are a universal call to action to end poverty, protect the planet, and improve people's prospects throughout the

world. In 2015, all Un Member States approved 17 goals as part of the 2030 Agenda for Sustainable Development, which sets out a plan to achieve the goals in 15 years, which are: the end of poverty, zero hunger, health and well-being, quality education, gender equality, clean water and sanitation, renewable and clean energy, decent work and economic growth, industry, innovation and infrastructure, reduction of inequalities, sustainable cities and communities, responsible production and consumption, climate action, life below sea, terrestrial ecosystem life, peace, justice and strong institutions, and the partnership to achieve the objectives [6].

This new society requires new artifacts and new capabilities, so that in a certain way unemployment has been fostered, by the replacement of man's work by that of specialized machines; sometimes, man is not replaced, but has to work with this technology, but then the problem arises of not having enough knowledge or the necessary resources to be able to get the most out of it. Although, despite this, we are fighting for the growth of the number of people engaged in the area of science or some of its sectors, because many workplaces have been lost, but new ones related to ICT, to trade, have also emerged; then, we are fighting for the increase of this staff, but, the poorest and most vulnerable people are still neglected, who do not have the ability to access the necessary education to be able to opt for any of these jobs, sometimes having, to be able to earn money that subjecting themselves to immoral employment, or even robbery and violence; to this we must add that these sectors are the ones that suffer the greatest effects with climate changes and those that take the longest to recover (if they recover). These inequalities compromise efforts to address environmental challenges, forcing the poorest and most marginalized groups to resort to practices incompatible with sustainability. while powerful elites can continue their kind of practices without fear of being subject to any recrimination [7].

Really the advancement in science and technology is a necessary requirement in the midst of the society in which we find ourselves. Currently, in Latin America, various strategies for the development of emerging technology companies are being tried, work is being done to achieve significant growth in the field of electronic commerce, the digital economy, ICT industries; possible to take advantage of the riches of this region, mainly in the agricultural sector, due to the humid tropical climate that most of these present countries, very favorable for this sector, so many researches and technological models have been adapted to this area, creating innovations own that have allowed a great growth of the production something What in Countries how Japan where the soils are very infertile and climatic conditions they are not very favorable, you could not take advantage 100 per cent; is working on the basis of taking advantage of the natural resources with a decrease in impact Environmental, the possible is also being done by reduce greenhouse gas emissions (GHG). In addition, it is struggling to get a alternative What Install one True democracy economic, where the economic model is oriented priority to meet the basic needs ofthegroup of the population [8].

B. Causes, problems and some of the solutions to Cuba's STI policies

The stated purpose of science and technology policy in our country was always to support the priorities of economic and social development. To some extent, this has directed attention to the use of scientific and technological knowledge, with intensity in the goals of inclusion and social equity. But there are things that need to be highlighted, Cuba, over the years, has faced and continues to face many difficult situations: colonization, neo-colonization, military attacks after the triumph, constant threats, the economic blockade, the fall of the Socialist Camp, our main iado,from which itentered into the so-called Special Period. Many challenges have been and continue to be crossed, really, in the country it has been complicated to create a favorable environment for the development of science and to be able to compete with the great technological powers; however, the Cuban Government has always been aware of the importance of science and technology to advance in this knowledge society and has taken a keen interest in the development of ins titutions and research centers, and in the quality preparation of professionals in this area, for which, many students and graduates even of several years, have had scholarships abroad, for their training. All this without deviating from what is really important, the people and their needs that can be satisfied with science, I dare to say that Cuba is one of the countries where less level of inequality is seen to acquire and exercise the knowledge. There is a free education of the same level for all, where the only condition for advancing more and more is the level of interest placed by the person; skin colour and sex are not an impediment in society.

However, this does not take away from the presence of various problems that have manifested. To begin with, there is the tendency to assimilate rather than produce technologies, and the frequent disinterest of the business segment, of the agents of change.

Technological, by innovating, explain that scientific development and the human potential created is not expressed with the expected practical results [9] , that is, the objectives and goals set by the research agendas and the needs are not alwaysachieved. that so much is sought to supply many times they do not manage to satisfy themselves.

In fact, there is some pressure on science personnel, who are sometimes demanded benefits and results that, as much as they wanted to, cannot be achieved so easily. The development of biotechnology was made possible by political will and resulted in both the generation of new knowledge and the creation of technology and the consequent concreteness in the field of biomedicine; however, in other areas the three processes — creation, domain and application of knowledge— they are disjointed, mainly due to the absence of aninstitutional infrastructure to guarantee them [10]

This influences of course, the situation Economic so Complicated y the Constant inconveniences with which the country has to struggle daily, which manifests itself in the lack of resources, of equipment and technicalEssential advanced cas in the treatment of diseases or for the study of they, lack of matter and reagents in the centers of research, resources from abroad No Exceed the 5%, y it the State who Finances the 95% of the activity of science y technology. A weigh of What of the budget allocated to science, the 10% to basic research, 40% to applied research, and the 50% to the development experimental, the sector productive, however, is not involved; in addition, the afterrcentaje of Doctors of the Areas of science e engineering, with respect to the total number of doctors in the country Graduates vain in descent [11]; even psychologically it has caused a great impact on many people What herself Form with the idea of What they will never be able to move forward and they will remain stagnant in one place, without giving rise to creative solutions e Innovative until What herself Comes a manifest also in Cuba the "brain drain", with which they have lost to many professionals (loss of caHospital human).

On the other hand, the limited access to modern instruments and up-to-date information, the lack of tradition or outdated scientific literature, as well as the poor command of the English language in some segments of the Cuban scientific community, worsen the situation.

Consequently, an important part of the scientific and technological activities carried out in the country does not generate material that can be published by a scientific journal [12]. There isalso a great concern about the expansion in the country of non-scientific beliefs that sometimes even play with the innocence of people, as an example of this we have witchcraft, methods of "medicine" natural" that, in the vast majority of cases, are nothing more than big scams that do not take into account the risks they can bring to people's health, and, unfortunately, many place more trust in these practices that in the health centers of the country.

All these problems are a reality that presents Cuba's technological policy, even so, the Cuban Government is not characterized by staying from arms crossed, which has been demonstrated along of history, and of course, it continues to fight in this area in the Which one herself is laboring envelope the base of Precepts y measurement What Allow find solutions, for the design of a comprehensive policy of science, technology, innovation and the environment that allow the country to advance, without deviating from the ideal socialist nor of the attention of the Problems Fundamental of the society. For begin the persistent absence of economic mechanisms that Favor o to the less Allow the contracting of transfer of knowledge between the called sector "budgeted", to the What Belong the Greater centres of wisdom of the country y the "business", Has obliged a To find New initiatives by the What herself is Investing in laboratories Complete for his use common y the generation joint of results scientists. The More recent cases involve both laboratories for the University in facilities Business like those of these in the universities, with staff top-level for your operation. Something similar has occurred with the internal services, and with the energy industry. This is an initial path which can bear fruit very valuable, despite the rigidity structural of our current organization Economic [13] .

In addition to this, vital significance is being paid to theeducation sector, as the place where man can access the knowledge necessary to feel fulfilled in the profession in which he aspires to work, with the highest possible quality, and it is being very intentional with the inclusion of the themes of humanities, to create the appropriate moral and ethical principles.

This educational system must also be able to adapt to the rapid advances that are taking place at a global level, and prepareits future professionals based onthis. One of the great challenges that Cuba has is to avoid the loss of more professionals, so it is working on the basis of creating better working conditions and wages for workers. The acquisition by the population of the best and most convenient means and services must also be encouraged through socialist policies of reduction of taxes on those that are most convenient for social and individual development [14] .

Despite the fact that the country has had to use technologies and knowledge transferred by other countries, even so, for Cuba, an indispensable requirement

for development, it is sovereignty, that is, own innovations. Unfortunately, this has not been possible to fulfill as it would like, precisely because of the underdevelopment still prevailing, but it does not mean that, as far as possible, it is required to put the maximum of each professional to achieve products of our own creation.

The best example of this is being demonstrated with the production of the vaccine against Covid-19, by the way, it should be noted how, in the midst of this pandemic situation, Cuba has shown that it has the potential for development. novel methods outside the everyday; an example of this is the new way in which the educational modality was structured, having to resort to different ways of imparting teaching by non-face-to-face means, always with the best possible quality, leading to the creation of even unique online teaching platforms.

This constitutes a great challenge, but, to achieve it, the intervention of several actors is required, as it says in the article "Science, technology and innovation policy in Cuba: trajectory and evaluation" "... The construction of these systems, supported by policies for science, technology and innovation, is not exclusively amatter forscientists and their institutions; it requires a strong intertwining between universities, research centers, governments at all levels, social groups, legal regulations, educational system, all to favor systemic interactions between innovation actors. This is perhaps the most important conceptual change in building the new PCTI."[15]

III. CONCLUSIONS

The policies that regulate scientific progress determine the facilities and the probabilities of solving current problems of an entire people, therefore, there are not a few of us who have to get involved in the improvement of the policies that this author assures that determine our way and standard of living. Public policies recognize that innovation is sometimes full of risks, precipitation, audacity and courage, but they are a path to which we are obliged to travel to conquer development in many areas, and sometimes it is the only way, the key is in build the avenues to innovate and take their risks, but in a prudent way. Each State must take a look inward, set aside justifications and excuses and according to its current situation implement a unique STI policy for them with an inclusive approach. Our Cuba is committed to the practice of knowledge and will continue to do so, but it will have to look more closely at the proposals and even needs and dissatisfactions of all its people from the technician to the engineer, doctor or graduate who generate science.

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DTH: intellectual author, participated in the conception and design, the acquisition of information, the analysis and interpretation of the information of the work that has resulted in the article in question. He participated in the drafting of the text and in the revisions thereof. He approved the version that is finally going to be published.

V. BIBLIOGRAPHIC REFERENCES

1. Núñez Jover Jorge. The democratization of science and the problem of power. Editorial Ciencias Sociales. Havana. 2019; 3.

2. Albornoz Mario. Innovation, equity and Latin American development. Revista de Filosofía Moral y Política, Centro REDES, CONICET, Argentina, part "Innovation and social equity". [internet]. 2013 [cited 21 Jun 2021]; 48:11-12. Available in: https://www.researchgate.net/publication/270073548_Innovacion_equidad_y_desarrollo_latinoamericano

3. Morin Edgar, Kern Brigitte Anne. Homeland Land. Editorial Nueva Visión, Buenos Aires, Argentina, Chapter IV, "La Antropolítica",part "La política vacía y fragmentada". 2006; 4.

4. Morin Edgar. We are on a Titanic. [internet]. 2003 [cited 21 Jun 2021]; 1-3. Available in: https://es.scribd.com/document/117832807/Edgar-Morin-We-are-in-a-Titanic

5. Núñez Jover Jorge. University, knowledge and development: new crossroads. A reading from science, technology and society, part "Chapter III: The 2030 Agenda for Sustainable Development (DS)", Editorial UH. [internet]. 2020 [cited 21 Jun 2021]; 46. Available in: https://www.researchgate.net/publication/342178758_Universidad_conocimiento_y_desarrollo_nuevas_encrucijadas_Una_lectura_desde_ciencia_tecnologia_y_sociedad

6. Núñez Jover Jorge. University, knowledge and development: new crossroads. A reading from science, technology and society, part "Chapter III: The 2030 Agenda for Sustainable Development (SD)". Editorial UH. [internet]. 2020 [cited 21 Jun 2021]; 44. Available in: https://www.researchgate.net/publication/3421787

58_Universidad_conocimiento_y_desarrollo_nuevas_encrucijadas_Una_lectura_desde_ciencia_tecnologia_y_sociedad

7. World Report on Social Sciences, (Abstract), UnESCO Editions, part II "The consequences of inequalities". 2020; 11.

8. Núñez Jover Jorge. The democratization of science and the problem of power. Editorial Ciencias Sociales. Havana. 2019; 8.

9. Núñez Jover Jorge, Montalvo Arriete, Luis Félix. Science, technology and innovation policy in Cuba: trajectory and evaluation, part "The model of centralized management oriented to the introduction of results". University of Havana Magazine. Editorial UH. 2019; 276: 22.

10. Pérez Rojas Hugo Celso, Pérez Martínez Aurora, Alvear Terrero Diana, Quintero Angulo Gretel. The basic sciences in Cuba in the XXI century, part "Cuba and the sciences in the XXI century". Temas Magazine. [internet]. 2018 [cited 21 Jun 2021]; 93-94: 24. Available in http://redint.isri.cu/revista-temas-93-94-enero-June-2018-science-e-innovation

11. Núñez Jover Jorge, Montalvo Arriete, Luis Félix. Science, technology and innovation policy in Cuba: trajectory and evaluation, part "The model of centralized management oriented to the introduction of results". University of Havana Magazine. Editorial UH. 2019; 276: 25.

12. Castellanos Serra Lila, Rodríguez Castellanos Carlos, Valdés Sosa Pedro. "Cuban science through its publications in arbitrary journals", part "Discussion". Temas Magazine. [internet]. 2018 [cited 21 Jun 2021]; 93-94: 15 Available in http://redint.isri.cu/revista-temas-93-94-January-June-2018-science-e-innovation

13. Montero Cabrera Luis A. Science and technology in Cuba a decade later, part "Possible solutions". Temas Magazine. [internet]. 2019 [cited 21 Jun 2021]; 93-94: 6 Available in: https://cubayeconomia.blogspot.com/2019/04/la-ciencia-y-la-tecnologia-en-cuba-una.html?m =1

14. Montero Cabrera Luis A. Science and technology in Cuba a decade later, part "Possible solutions". Temas Magazine. [internet]. 2019 [cited 21 Jun 2021]; 93-94:9 Available in: https://cubayeconomia.blogspot.com/2019/04/la-ciencia-y-la-tecnologia-en-cuba-una.html?m=1

15. Núñez Jover Jorge, Montalvo Arriete, Luis Félix. Science, technology and innovation policy in Cuba: trajectory and evaluation, part "The model of centralized management oriented to the introduction of results". University of Havana Magazine. Editorial UH. 2019; 276:29-30.