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EDUCATIONAL SCENARIOS OF PUBLIC HIGHER EDUCATION IN BRAZIL DESIGNED BY THE SARS-COV-2 VACCINE AND ITS TECHNOLOGY TRANSFER IN THE YEAR 2020

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ABSTRACT

The present study aims to analyze the transmutations produced by the Covid-19 vaccine perspective and its technology transfer in the Brazilian Federal Public higher education scenario in the year 2020. This is an exploratory study with a predominantly qualitative approach to the problem and documentary technical procedure. The research corpus was composed of information made available on the institutional websites of several public agencies related to education and health. The content analysis technique was adopted to examine the documentation gathered. It was found that at the end of 2020 the vaccine was not available. At this moment the alternative adopted by Instituto Butantan and Fiocruz was to sign contracts for the importation of vaccines developed by foreign pharmaceutical companies and technology transfer in vaccine production. All the Federal Institutions of Higher Education remained, since the decree of the pandemic, with remote teaching activities. It is comcluded that the change in the current framework must occur only with vaccination.

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INTRODUCTION

The year 2020 was an unusual one. With the emergence and rapid spread of the SARS-CoV-2 virus, in conjunction with a Severe Acute Respiratory Syndrome and the development of a disease called by the World Health Organization (WHO) Coronavirus disease 2019 (Covid-19), there were severe consequences for infected people, including a high number of deaths. According to the WHO's Covid-19 epidemiological update (WHO, 2020), the number of cases in Brazil through December 31, 2020 was 7.68 million, with the cumulative number of Covid-19 deaths at 194,949. The Federal Institutions of Higher Education (IFES) had to adapt to this new reality and started to adopt remote teaching as an alternative to classroom lessons. Most IFES were not prepared for this transformation, requiring planning and structural changes that demanded time and planning so that the academic activities could continue. In the scope of the Ministry of Education (MEC), the temporary closure of universities and institutes and the substitution of presential classes by digital classes were supported by globally adopted measures. And, although they represent strict actions to reduce transmission, they have a value legitimized by science to meet the goal of preventing, containing, and mitigating the spread of the coronavirus. The MEC has been working, continuously, to find ways and solutions to better meet the concerns of the academic community and its professionals. The flexibilization of academic activities during the pandemic period, with the substitution of presential classes for remote activities, helped in the fight against the pandemic. Given the severity of the pandemic, the offer of face-to-face teaching proved to be unfeasible by the year 2020, causing public educational institutions to seek alternatives to the teaching offer. Together with research institutes, alternatives to combat the virus were sought through the development of supplies to disinfect environments, protective equipment, respirators, and the search for vaccines in partnership with pharmaceutical companies. The present study, considering the pandemic year 2020 and focusing on the IFES, aims to analyze the transmutations produced by the Covid-19 vaccine perspective and its technology transfer in the Brazilian federal public higher education scenario in the year 2020.

METHODS

Exploratory study with a predominantly qualitative approach to the problem and documentary technical procedure. The body of research was composed of documents collected from the websites of the National Association of Directors of Federal Institutions (ANDIFES), the Federal Universities, the Ministry of Education (MEC), the Ministry of Health (MS), the World Health Organization (WHO), the

Pan-American Health Organization (PAHO), the Oswaldo Cruz Foundation (FIOCRUZ), and the Butantan Institute. To contextualize and understand the practices of combating Covid-19 in federal universities, information made available on the institutional page of ANDIFES and the Federal Universities was surveyed. The MEC was consulted to verify the directives and ordinances published related to education policies in the year 2020. The WHO, PAHO, and MS websites were consulted in order to collect information about the number of cases and deaths, as well as the procedures that were adopted in each specified period (restrictions, *lockdown*). In relation to FIOCRUZ and Instituto Butantan, information was collected on vaccines, Active Pharmaceutical Ingredients (API), and technology transfer. The consultation considered the period between March and December 2020. To analyze the research corpus, the content analysis technique was adopted. The parameters proposed by Bardin (1977) were observed. The final categories extracted from the analysis were: internal and external actions involving the IFES and Covid-19 vaccine and technology transfer.

The Pandemic in Brazil: The WHO declared a public health emergency of International concern on January 30, 2020 (PAHO, 2021a), the organization's highest level of alert, as provided for in international health regulations, regarding Covid-19. On March 11, 2020 it characterized Covid-19 as a pandemic, indicating that the virus was circulating on all continents. The MS published Ordinance 188 on February 3, 2020 (MS, 2020a). With the ordinance, a public health emergency of national importance (ESPIN) was declared, Following this, on February 06, Law 13,979 was enacted, which provides for measures to address the public health emergency of international importance, arising from the coronavirus (MS, 2020b). The MS received the first notification of a confirmed case in Brazil on February 26, 2020 (MS, 2020d). Brazil was one of the countries that suffered the most from the impact of the SARS-CoV-2 virus in the world. Together with Severe Acute Respiratory Syndrome (SARS), SARS-CoV-2 produced a large number of deaths. The cross-referencing of the numbers of cases and deaths makes it possible to understand the impact of the pandemic on the Brazilian educational system and, within this system, on the IFES, with the suppression of face-to-face teaching. The decisions of the responsible bodies for the suspension of the school calendar and the projection of the return to classroom activities are closely linked to the numbers of the human tragedy called Covid-19. The graph with the number of new daily cases of Covid-19 allows you to check the evolution of cases during the year 2020 (Figure 1).

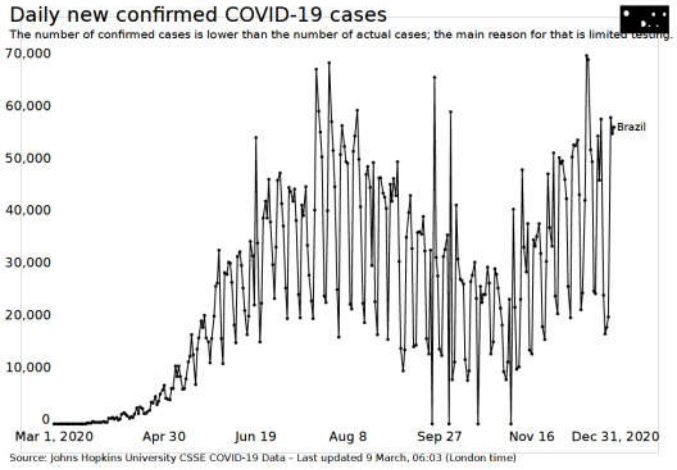

Figure 1. Number of new daily confirmed cases of Covid-19 in Brazil. Source: Our World in Data website, 2021

With this data it is possible to identify the periods when there were the highest numbers of Covid-19 cases in Brazil. It is a fact that Brazil had a high number of confirmed daily cases, the second highest in the world, in the year 2020. Until the first half of the year there was a steady growth until it peaked on July 29, 2020, with 69,074 new cases. On the same day 1,595 deaths occurred, the highest number up to that point in the pandemic (Figure 2).

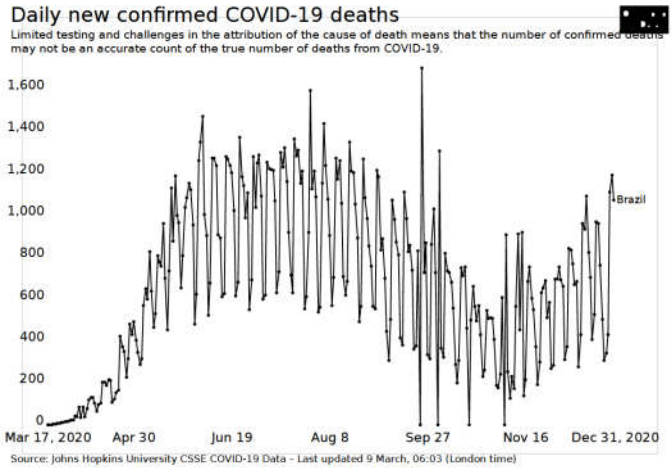

Figure 2. Number of confirmed Covid-19 deaths in Brazil Source: Our World in Data website, 2021

The peak occurred in the winter period, where there is an important circulation of respiratory viruses that can cause pneumonia and sinusitis, among other diseases. This circulation occurs throughout the year, but in the winter period there is a higher frequency of these diseases, because people are more concentrated in spaces and with less ventilation (MS, 2020c). Soon after the end of the winter period there was a slowdown in the number of new cases per day, with some occasional sporadic increases. The cases had a significant increase again starting in November 2020, going from 8,501 cases on November 2 to reach a peak of 70,574 on December 15. Analyzing the data it is possible to see that there has not been a complete mitigation of Covid-19 cases in 2020, nor the right scenario for face-to-face activities to resume. In the second half of 2020 there was a drop in the number of deaths, with 172 on November 2. From this date on, there is again a significant increase, until reaching the value of 1,703 on September 24, 2020, the highest of the year (Figure 2). Brazil closed the year 2020 with an accumulated number of 194,949 Covid-19 deaths.

Higher education scenarios in brazil in times of Pandemic: The situation in March 2020 was one of apprehension. Little was known about the new virus that had been found in the city of Wuhan, China, and the consequences that the pandemic could reach. In this period the IFES were functioning normally through face-to-face activities. In the Federal Universities network, there were articulations and the creation of working groups with the objective of discussing the next steps that they should follow. An example is the Federal University of Alagoas (UFAL) that, through the Circular Memorandum $^{no.}$ 06/2020 of March 12, 2020, from the central administration and the coronavirus management committee, determined guidelines for the prevention of the disease, specifically indicating that people arriving from abroad in that period should be quarantined in case they showed symptoms (ANDIFES, 2020a). The memo also indicated basic prevention measures such as hand washing, the importance of covering nose and mouth when sneezing, and the incorporation of the use of 70% alcohol gel. It was determined that, as long as there were no cases detected at the university, the activities foreseen in the academic calendar should be maintained at UFAL. On March 12, 2020, the date of UFAL's Circular Memorandum n$^{o.}$ 06/2020, the world had accumulated 132,492 cases, with 4,917 deaths. Brazil registered 52 cases, with no deaths. In a joint note, the Federal University of Ouro Preto (UFOP), the Federal University of Rio de Janeiro (UFRJ), the Federal University of Espírito Santo (UFES), the Federal University of Health Sciences of Porto Alegre (UFCSPA) and the Federal University of Pelotas (UFPES) indicated the attention for the characterization of a pandemic situation and defined some preventions that should be taken (ANDIFES, 2020b). The note highlights the concern with people who arrived from countries with

cases of virus infection, showing concern about a possible "importation" of the virus into the internal environment of universities. As a precaution, they should remain in quarantine for 7 days if they had no symptoms of the disease (asymptomatic) and, in cases where people had fever and other symptoms, for 14 days.

On March 13, 2020 three possible scenarios were determined to be adopted by the IFES (ANDIFES, 2020b):

- ✓ No case confirmed in the city: activities are continuing normally, maintaining the prevention and protection measures;
- ✓ Confirmed cases in the city: protective measures should be redoubled in places of circulation (museums, movie theaters, theaters) open to the internal or external population. Events should be avoided;
- ✓ Confirmed cases in universities: suspension of activities in crowded places for fourteen days. After this period has passed, a reassessment should be made to verify the possibility of a safe return to activities.

The joint note also stated that IFES should be guided by evidence-informed policy making to incorporate research findings into policy debates and internal public sector processes, enabling improved decision-making during the pandemic period. Scientific knowledge should guide the process of policy formulation and implementation, making policies more effective. The Federal University of ABC (UFABC), on March 12, 2020, published recommendations and arrangements about Coronavirus (UFABC, 2020). In the publication it was informed that classes should be maintained. The institution created communication channels to centralize official information about the Coronavirus. Preventive measures were determined to avoid contagion by the virus. As the number of infected people in the country at that time was low, with no recorded deaths, the first reaction of some IFES was to cautiously monitor possible cases, continuing with classroom teaching activities until there was some change in the situation. Regarding the unavailability of specific drugs and vaccines to cure Covid-19, non-pharmacological measures were adopted, which the WHO recommends such as social distancing, the use of respiratory etiquette, and hand hygiene (MS, 2020e). These were measures adopted to contain the virus, aiming to reduce transmissibility in the community with the main goal of slowing the progression of the epidemic in actions that mainly serve to reduce the number of cases. This would reduce the impact on health services, making the system not overloaded (MS, 2020c).

Government agencies played a relevant role in coordinating responses to the pandemic. MEC, through Ordinance nº 343, March 17, 2020, expressed itself about the replacement of classroom teaching activities by classes in digital media, while the pandemic situation remains, for the higher education institution member of the federal education system (MEC, 2020a). There were adjustments through ordinances nos. 345, of March 19, 2020, and 356, of March 20, 2020. On March 18, 2020, the National Council of Education (CNE) brought the necessary information to the systems and education networks at all levels, stages, and modalities because of the reorganization of academic activities due to the pandemic. On April 1st, 2020, the Federal Government issued the Provisional Measure nº 934, which established the exceptional rules for the school year in basic education and higher education as a result of the measures to deal with the public health emergency situation described in Law 13.979, of February 6th, 2020 (GF, 2020). Article 2 indicates that higher education institutions may be exempted (on an exceptional basis) from the obligation to observe the minimum number of days of effective academic work. In March 2020, after remote classes were authorized to be taught, at least 38 universities decided not to use this modality, indicating they were unable to offer activities with a quality equivalent to face-to-face teaching, in order to ensure that all students have access to the contents taught (Branco & Neves, 2020). One of the main institutions in the country, UFRJ made the choice to temporarily suspend academic activities, claiming to be unable to guarantee access to remote activities. One of the points analyzed is that a large portion of the students come from low-income families, with monthly per capita income of up to 1.5 minimum wages. Almost two months after the publication of MEC's Ordinance nº 343 allowing the use of remote teaching, on May 14, 2020, only 6 out of 69 federal universities in Brazil have adopted the remote teaching modality, with just under 100 thousand students attending classes, against more than 960 thousand students standing still (Soares& Silva, 2020). One of the main negative points for the attendance of remote activities is the access to classes, since a significant portion of students, especially after the adoption of quotas in Brazilian federal universities according to Law nº 12.711/2012 of August 2012 (PR, 2012), do not have the financial conditions to hire a data package for the connection to the Public Internet and many do not have computers to perform the remote activities. This highlights the differences and difficulties of students who come from lower income classes. Brazil is a country of social differences and poor income distribution, and in these tragedy situations these differences are more evident.

The IFES have taken a leading role in sharing technologies, knowledge and scientific research in the fight against the pandemic (UNILA, 2020). In the first half of 2020, the federal universities were responsible for several projects, such as: 2,717 beds in university hospitals, 823 researches on the virus, 96 actions to produce alcohol, 276,000 pieces of protective equipment, 55,000 Covid-19 tests, in addition to educational campaigns, solidarity actions in the communities, and partnerships with municipal and state governments (ANDIFES, 2020c). This shows that the importance of universities goes beyond the classroom, confirming the integration with society in social projects. The situation in October 2020 indicated that of the 69 federal universities, 66 were offering remote teaching to students, showing an adaptation to the new scenario imposed by the pandemic (Tokarnia, 2020). The movement to resume classes in a remote format was decided individually by each university, resulting in calendars that differed from each other. Some institutions had a longer period to adapt to the requirements of remote teaching, while others made this transition more quickly. The University of Brasilia (UNB), for example, resumed teaching activities related to the first semester of 2020 only on August 17th. With the change from in-person to remote teaching it was necessary to find technological tools that could support teachers and students in the development of academic activities. One resource made available to the universities was the webconference service of the National Research Network (RNP), which at the beginning of the pandemic expanded its capacity to serve users, allowing a number of 123 thousand students and teachers. The MEC's initiative came to meet the change from face-to-face teaching to remote teaching, enabling teachers to create virtual classrooms and teach their classes in an *online* format. The virtual classrooms created by teachers can be accessed by personal computers and smartphones (MEC, 2020b). The measure aims to support teachers and researchers at the IFES, and to support Information Technology (IT) departments by providing technological inputs to increase the capacity of existing remote communication and collaboration solutions.

On December 10, 2020, the MEC approved the CNE opinion that allowed remote classes to be given on an exceptional basis, being these exempted from the requirement of compliance with the minimum number of days of effective academic work (MEC, 2020c). The end of 2020 created expectations for education for the next school year, but the initial scenario has not changed. Classes are still suspended and remote activities continue to be the main teaching modality in the IFES. While it is not possible to vaccinate most of the population, it will not be possible to resume classes in the face-to-face modality. It can be seen that there has not been a complete mitigation of the number of SARS deaths and with this, there is no real situation for the return to classroom activities. The year ended with a number of 1,074 deaths on December 31. According to the data analyzed (figures 1 and 2), there was an expressive number of cases and deaths caused by Covid-19 in Brazil in 2020. This disease caused morbidity and mortality, directly affecting its population in various sectors of human life, such as social, educational, and economic, thus indicating the urgent need for effective and safe vaccines (PAHO, 2021b).

Vaccine, Technology transfer and Scenario Changes: One way to measure the benefit of a mass vaccination program, which aims to combat an infectious disease, is to assess what is the risk of death or permanent injury from the disease when there is no mass vaccination program (Magno & Golomb, 2020). Since the numbers of cases and deaths indicated in the survey are high, normality should only happen when a major portion of the population is vaccinated. For Queiroz et al. (2020) the spread of the virus has challenged the world to accelerate research in companies and universities in the search for a safe environment with an effective vaccine against SARS-CoV-2. Brazilian science is showing its value to society at a crucial moment, for the unique chance it has to participate in the global innovation effort for universal access to the Covid-19 vaccine (Buss & Fonseca, 2020). The challenge to develop vaccines in record time to combat Covid-19 has brought to the fore the need for scientific and technological development by countries. The efficacy and safety of vaccines should be established based on observation between the candidate product and humans in tests conducted in a controlled environment (Guimaraes, 2020). Effective and safe vaccines must adopt criteria that transcend the intrinsic characteristics of the product, criteria that mediate between their inherent technologies and their arrival in the organisms of people belonging to the target populations they are intended for. These are criteria related to their efficacy.

The process used to manufacture Influenza and yellow fever vaccines in Brazil uses chicken eggs, where an equipment with micro-needles injects the virus into each egg that is then taken to an incubator for 72 hours in order to replicate the viral load (PSP, 2018). The SARS-CoV-2 virus is different from the viruses that existed because it does not develop in chicken eggs, making the process already used for the manufacture of the new vaccines in the national territory unfeasible. To manufacture a vaccine for the Coronavirus requires a specific platform that no Brazilian institution or company had, being necessary the construction of this new platform to enable the manufacture of specific vaccines for this new type of virus. Brazil has two public institutions that stand out in the immunobiological area: FIOCRUZ which is a strategic institution of the federal government and is committed to health, and the Butantan Institute, which is the main producer of immunobiologicals in Brazil, responsible for a large percentage of the production of hyperimmune serums and a large volume of the national production of vaccine antigens, which compose the vaccines used in the National Immunization Program (PNI) of the MS. The MS (MS, 2020b), through the General Coordination of the National Immunization Program (CGPNI) and the Department of Immunization and Communicable Diseases (DEIDT) of the Secretariat of Health Surveillance (SVS), presented the National Operationalization Plan for Vaccination against Covid-19 as an additional response measure to address the disease, considered a Public Health Emergency of International Importance (ESPII). The plan was developed in line with the global guidelines of the Pan American Health Organization and the World Health Organization (PAHO/WHO).

Several vaccines are being developed by different institutes and pharmaceutical companies around the world. Some vaccines stand out for being more advanced in clinical trials: the vaccine developed by Oxford University associated with the British pharmaceutical company AstraZeneca, the vaccine from the Chinese company Sinovac Life Science and the vaccine from the American companies PFizer and Moderna. In the case of Brazil, there are vaccines being developed in university laboratories, but these vaccines are not in the clinical testing phase, as is the case at the Federal University of Paraná (UFPR) and the Federal University of Minas Gerais (UFMG). The Oswaldo Cruz Foundation (Fiocruz) and the Institute of Technology in Immunobiologicals (Bio-Manguinhos) signed on September 08, 2020 a Technological order contract with the British pharmaceutical company Astrazeneca UK Ltda for the vaccine called ChAdOx1 nCoV-19 or AZD 1222 which is that it is based on adenovirus vector with expression of the SARS-CoV-2 spike protein (Lima et al., 2020). This contract provided for the sale of ready-made vaccines and the Active Pharmaceutical Ingredient (API) but did not yet provide for the Technology Transfer for the manufacture of the vaccine, which must be done by March 2021, thus enabling the vaccine manufacturing process to be internalized by Fiocruz. The São Paulo state government signed a term of commitment with biopharmaceutical company Sinovac Life Science for the purchase of the Coronavac vaccine, which is a vaccine that uses an inactivated virus to stimulate the immune response. The purchase of ready-made vaccines, the API, was foreseen, and also formalizes the technology transfer for the internalization of Sinovac's vaccine manufacturing process by the Butantan Institute. According to forecasts, domestic production should begin by the end of 2021. In this way, agreements that are being developed in partnership with international pharmaceutical companies are more advanced and give the Brazilian population the possibility to have access to the vaccination resource. Some of these agreements provide for Technology Transfer, which may allow national institutes to manufacture the active ingredient of the Covid-19 vaccine, thus enabling production to be internalized, making Brazil no longer dependent on the import of the active ingredient. Currently, Brazil is involved in the clinical development of two vaccines: one with the Butantan Institute associated with the Chinese company Sinovac Life Science and another with the FIOCRUZ and the Institute of Technology in Immunobiologicals (BIO-MANGUINHOS), which is associated with the University of Oxford and the British pharmaceutical company AstraZeneca. As the country is not self-sufficient in the production of the specific vaccine, it is essential at this time of the pandemic that Brazilian immunobiological institutes make technology transfer agreements with foreign companies that have the necessary knowledge in the manufacturing process.

Technology transfer indicates a process of disseminating relevant knowledge technologies, as well as the results of their implementation. This process can generate products for the parties involved: industries, institutions, or entities (Silva et al., 2018a). The Technology Transfer process has become an effective means by which the dissemination of innovation and knowledge can be transmitted. This process indicates a competitive alternative for companies, which seek the use of new technologies, and also in the acquisition of external partners, who hold the technology (Silva et al., 2013b). The Technology Transfer processes, for being more feasible than institutions, already have a strategic work of technology mapping. One of the tools used to assist in research and development of technologies to fight pandemics is technology mapping. The licensing of technologies under patent can enable industrial development, as well as partnerships for technology transfer between companies and research institutes (OLIVEIRA, 2020). In the development of new technology projects, agreements must be made with a clear definition of intellectual property and the conditions for technology transfer to occur. Intellectual property is an important instrument for all actors involved, whether they are researchers or industrialists. Through the use of intellectual property, there is the possibility of identifying markets for the use of technology and licensing, as well as foreseeing the arrival of new technologies and monitoring competitors. In this pandemic period there is an even greater need for the use of technology mapping, because it enables the prediction of necessary investments and assistance in developing processes for industry with less risk of infringements of existing patents (OLIVEIRA, 2020).

With the agreements between the companies signed, the Brazilian institutions can import the ready-made vaccines or the API. The advantage of importing API in relation to the ready vaccine is that with its use it is possible to manufacture a larger quantity of vaccines. For example, at FIOCRUZ, with 1 liter of API it is possible to manufacture approximately thirty thousand doses of the vaccine, while at the Butantan Institute, with 1 liter of API it is possible to manufacture approximately one thousand five hundred doses of vaccines. The importation of API with the bottling here in Brazil makes the internal logistics easier. The Covid-19 pandemic has brought to light the inequalities that exist in the world. While a few countries have the technology and can be self-sustaining in vaccine production, others must struggle to import the vaccines and pay a

high price for the technology to be transferred so that production can take place domestically. Developing countries that are not self-sustaining are dependent on the policies of the countries that own the intellectual property of the immunizers. Brazil once played a prominent role in the immunobiological sector, but is currently losing more and more space to countries like China and India. The investments in this sector in Brazil are decreasing, while in the countries mentioned above, the investments are increasing. This scenario indicates that knowledge is the master key for self-sufficiency in the immunobiological sector, it is necessary that investments occur so that Brazil does not become dependent on other countries in relation to vaccines.

Pharmaceutical innovation is heavily science-based (Chamas, 2020). Technological learning can take years to learn. Investment and strategies must be long-term, as it usually takes a long time to achieve solutions in this sector, and the results can be uncertain, with risks to the investments. With the emergence of Covid-19 the number of research in this vaccine area has grown exponentially. More than past crises, the pandemic has highlighted the need for a structured model to enable the development of safe and effective products, and this development has to occur at high speed (Chamas, 2020). Thus, we realize that it is necessary to make significant investments in the development of research, technology, and innovation, and the partnership with Brazilian public universities may be the most viable alternative. For it is in these environments that the greatest intellectual capital of the country is concentrated and that can, with the necessary policies and investments, give quick answers to the fight against pandemics. The normality of the populations lives and the return of face-to-face activities depends on immunization. As Brazil is not self-sufficient in the specific production of the vaccine against the SARS-CoV-2 virus, the scenario on December 31, 2020 is the importation of the ready-made vaccine or the API, for the filling in Brazilian laboratories. Either one or the other puts Brazil in a situation of dependence on other countries and companies that hold the technology for production. Several countries have already started their vaccination plan, like the United States and Israel, counting on a possible immunization of the population by the end of 2021. The temporary solution is the transfer of technology for the production of the Covid-19 vaccine, so that the process is internalized, making the country independent from other nations/companies. The long-term solution is to invest in research and development in the immunobiological sector in order for Brazil to be able to develop its own technology in the production of vaccines. It is necessary to stop being basically an exporter of commodities and importer of technologies, and reverse this scenario, so that the country can be self-sufficient in the area. The current situation is that Brazil will pay dearly for both the importation of the ready-made vaccine and the API and the technology transfer from foreign companies. On the other hand, despite the strong influence produced by the deterioration of the economy, with Brazil falling from the sixth world economy in 2016 to the twelfth position in 2020 (Balassiano & Considera, 2020), immunization is the only viable alternative until an effective drug for treatment is developed. Before that, it is impossible to imagine the return to normality of universities and other human activities.

CONCLUSION

The pandemic drastically affected the education system in the IFES in the year 2020. The educational situation has been shaping up as changes have occurred on the national scene due to the Covid-19 pandemic. In the beginning, most IFES adopted a position of continuing classroom activities, with policies based on the non-pharmacological measures that the WHO recommends, such as social distancing, the use of respiratory etiquette, and hand hygiene. Following this, there was a significant number of cases and deaths, which led to the suspension of classroom activities. The educational institutions had to adapt to this new reality and some universities decided not to start classes immediately in this new way of teaching, presenting problems with the support tools used and the students' difficulties in accessing online content. In the second semester the IFES managed to organize themselves based on a methodology and almost all the universities were able to carry on with their academic activities. The year ended with perspectives for the next academic period, but the educational situation did not change, since the number of cases and deaths closed the year at a high level and the IFES continued with remote activities. If these numbers do not decrease during the year 2021, there will be no normality and academic activities will continue to be remote. The solution to this problem is a vaccination plan for the entire academic community.

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