Academia Journal of Educational Research 8(12): 509-513, December 2020
DOI: 10.15413/ajer.2020.0149
ISSN 2315-7704

Research Paper

Environmental sustainability within the framework of remote education during the pandemic in Peru

Accepted 27th October, 2020

ABSTRACT

The objective of the study was to analyze environmental sustainability in the framework of non-face-to-face education during the pandemic, which has been generating a sui generis environment as a result of covid-19, where students develop their activities with limitations due to the effect of the fight against the pandemic and the economic crisis that puts at risk in quality education based on the principles of universalization of education in Peru. The limited technological equipment and materials leads to poor conduct of the training processes, which results in non-compliance with educational standards, generating inequalities among the student population in rural and urban areas, as well as among those who can access private and state education. For this, the qualitative approach with a prospective non-experimental design has been used in which the content analysis was carried out based on the bibliographic review on the subject. Among the results obtained in said analysis, we first had those linked to the Sustainable Development Goals (SDG) proposed by the United Nations (ONU): the possibility of providing an educational service not in person, allows reaching more students regardless its geographical location, however, due to the shortcomings and limitations of technological support in the most remote areas, secondly, we took from the environmental point of view; By not having to travel to the study centers, displacements are reduced to zero by students, reducing carbon emissions. In conclusion, decision-making in environmental management by local and regional authorities, to promote sustainability, prioritizing natural resources and biodiversi ty as a source of life for the populations of the future, engaging students in regener ative activities of the comprehensive environmental system.

Key words: Environmental sustainability, educational quality, technological means, accessibility.

Bessy Castillo-SantaMaría[1*], Miguel Sebastian Armesto Cespedes[2], Daniela Medina Coronado[1], Otto Herbert Koenig Amputia[3]

[1]Cesar Vallejo University.
[2]Peruvian University of Applied Sciences.
[3]Independiente Investigator

*Corresponding author. Email: bsscstll@gmail.com.

INTRODUCTION

One of the greatest challenges that arise in crisis situations, in this case not only at the national level but also at the global level, such as the COVID 19 pandemic and its effects in all areas that make up our existing society. In this analysis, we seek to establish the nexus between two very important aspects, such as: environmental sustainability and non-face-to-face education for students during the crisis of the pandemic in Peru. It is worth emphasizing that both environmental sustainability and remote education had different origins long before the COVID 19 pandemic. Awareness of the sustainable use of our natural and produced resources dates from the recognition of global climate change on our planet. Non-face-to-face education arises from the need to expand scientific exchange between different institutions, regions and countries. However, the planning and management of strategic execution that existed before the pandemic are today faced with a completely different challenge given the crisis in the area of health, employment and the increase in poverty. The objective of this study is to analyze environmental

sustainability within the framework of non-face-to-face education during the pandemic, it generates a sui generis environment as a result of covid-19, for students in Peru

A large number of entities: ministries, universities, local authorities must deal with gaps between strategy, health crisis, economic and daily tasks, which implies facing a significant number of failures within the interaction of environmental sustainability management and non-classroom education. But the problem is much more serious than it seems: in addition to these types of gaps, on many occasions, the general situation of a strategy is evaluated based on indicators focused only on political, economic, environmental and social aspects, leaving set aside key elements to achieve eco-efficiency and quality environmental education. Currently, there are high-quality tools such as specialized software that allows the creation of more complete strategic plans and with a high level of adaptability to the current specific situation.

This requires a comprehensive method of planning, monitoring and organizational management that allows understanding the performance of environmental sustainability management entities and remote education. This analysis has a theoretical approach based on currently existing studies and guidelines, this implies increasing the amount of information that must be observed and understood. One of the most important challenges that a strategic plan has within this context is to guarantee its adequate implementation from which the objective of this research is derived.

Environmental sustainability

Environmental sustainability is the relationship between resources and the ecosystem, oriented to the sustenance of humanity, in order to satisfy food needs related to the environment, society and the economy, United Nations Food and Agriculture Organization Agriculture (FAO, 2010). In objective 11 of sustainable development - sustainable cities and communities - cities are increasingly urbanized, which means that half of the population lives in cities, causing 70% of carbon emissions and the use of 60% of the resources, United Nations Organization (ONU, 2015).

According to De Las Heras et al. (2020) and De la Rosa et al. (2020), environmental sustainability is concentrated in economic and social activities, which causes environmental problems. Due to the increase in the population in the city, thus generating greater consumption of food and energy, which segregates a large amount of solid waste, capable of achieving its transformation, in this sense, Limón-Domínguez (2019) maintains that the growth of the population is related to production systems, a phenomenon that has been getting worse due to the exorbitant consumption of energy and non-renewable resources, without considering economic, political and social regulations, clinging to individual selfishness that produces the destruction of biodiversity and society.

In line with this, Castillo (2019) reported that the characteristics of environmental problems are (i) globalizing, (ii) complex, (iii) transdisciplinary, (iv) comprehensive and (v) continuous and interdisciplinary that allows a better visualization of the problems of the sustainable development. It is of interest to objectively maintain environmental balance through a social culture committed to renewal and sustainability. Regarding this, Arias (2017) considers sustainability to be fair, as a systemic paradigm of transformative visio.

Achieving mitigation in environmental sustainability systems in the world has been promoting various studies and work meetings to raise awareness of the environmental reduction of industrial and population development, where Asumadu et al. (2020) argued that there is an excessive dependence on energy consumption based on fossil fuels and natural resources, mitigating growth to climate change as well as its impacts, depend on government policies that promote environmental sustainability. And Sadi et al. (2020) mentioned that the reduction of energy is to avoid pollution and maintain sustainability through the use of energies such as: solar, wind, geothermal, biogas, tidal, wave, being these environmentally friendly.

The industrialized countries and nuclear power generators are called to contribute to the environmental health of the planet. Therefore, Zman and Abd-el (2017) reported that "energy emissions and world growth [...] exclusively determine socioeconomic and environmental problems". However, in developing countries, the environment is affected by continuous processes of extractive activities of natural resources. The applications in intensive agriculture crops, product of technical deficiencies and unfulfilled policies by government institutions clinging to corruption, causes environmental and social problems (Castillo-SantaMaría et al., 2020; Sarah-Lan et al., 2020)

From the point of view of society and the environment, the Peruvian government proposes strategies based on: (a) environmental conditions, (b) environmental health and (c) quality of life, which generally affects the economy and production , according to studies carried out by the Organization for Economic Cooperation and Development (OECD, 2016). In this sense, it is about prioritizing society from the dangers that are presented by adverse weather conditions. The negative implications of the covid-19 are reflected in economic, social and political factors, due to the excessive use of electrical energy in homes, whether due to domestic appliances or equipment such as computers, laptop, cell phones, among others, that are used for work via virtual, development of non-contact classes, online commerce, search for information, this currently being the main tool at home in middle and upper class families.

According to Sacristán (2020), the recovery due to the covid-19 effect should focus on environmental and social sustainability. However, the reduction in citizens' mobility

due to the pandemic context has had an impact on socio-environmental habits and practices; such as: alternative educational practices within our borders, which initially aimed to reach the largest number of students despite their geographical location, but due to the structural reality in which we are immersed, they have been evidenced as the deficiencies and inequality gaps that exist within the population, regarding access to various services; To this, it can be added that, under these new conditions of life and interaction, the mandatory use of personal protective equipment (masks, glasses, gloves, coats, among others) has caused an increase in the generation of solid waste that is added to those generated by informal trade, which has overflowed in the large cities of the country as a result of changes in working conditions since it has forced a segment of the population to find quick solutions that allow them to generate economic income.

Non-face-to-face education

Education over time has been adapting to new contexts, and this has led to new ways of carrying it out, therefore, distance and digital education has been gaining space compared to face-to-face. However, success will depend on the strategies used according to the actors involved in the process and the technological use they give it to ensure its effectiveness in achieving the objectives set without affecting its quality (García, 2017), within In this new scenario that implies changing the design and educational model, the "new" student assumes a new role.

Furthermore, it is added that the use of Information and Communication Technologies (ICT) are not only necessary to consolidate the educational process, but also must be considered as part of the continuous and comprehensive training of students (Juca, 2016). According to Durán (2015), he argued that there are various study modalities: face-to-face, blended, distributed, distance, virtual, online education, blended and non-face-to-face which was initially devised as a type of teaching by mail to reach an audience which was outside the geographical reach of the institutions, basically, texts were used that included the topics to be learned accompanied by exercises, so that the students appropriated knowledge that will later lead them to be evaluated (Santángelo, 2000). For universities, the non-face-to-face education model is part of the technological transformation that implies redoubling efforts on the part of the teacher and the institutions that must see the new proposal seriously without underestimating it (García, 2020)

While seeking to establish differences between the face-to-face and the non-face-to-face modality, in the first case, the student and the teacher are in the same space-time dimension, while in the second case, the teacher and the student, both actors are not in the same spatio-temporal dimension, providing great geographical and temporal autonomy. Teaching is done through the exploratory work of the students themselves who acquire an active behavior in the learning process.

The adaptation of face-to-face sessions to non-face-to-face sessions due to COVID-19, was authorized in Peru, through article 21 of Urgency Decree No. 026-2020 (Government of Peru, 2020), in that framework, the Ministry of Education established the regulatory provisions and / or guidelines, so that public and private educational institutions under its scope, provide the service using non-face-to-face or remote mechanisms.

Likewise, regarding Basic Education, the Ministry of Education issued the one that provides for the beginning of the school year as of April 6, 2020 through "I learn at home", a multi-channel remote education strategy, which seeks to deliver the learning sessions through television, radio or internet (Minedu, 2020a) and Vice-Ministerial Resolution 088-2020- MINEDU that seeks to guarantee non-face-to-face educational service in conditions of quality, equity and diversity during the state of national emergency, considering the activities organized according to the National Basic Education Curriculum (CNEB) by cycle, grade and curricular area (Minedu, 2020b).

Regarding University Higher Education, the Ministry of Education issued Vice Ministerial Resolution 085-2020-MINEDU (Minedu, 2020c) that provides "guidelines for the continuity of the university educational service, within the framework of the health emergency caused by COVID 19 ", While the National Superintendency of Higher University Education (SUNEDU) issued the Resolution of the Board of Directors 039-2020-SUNEDU-CD that approves the" Criteria for the supervision of the adaptation of non-face-to-face education, with exceptional character, of the subjects by universities and graduate schools as a result of the measures to prevent and control COVID-19 ", documents that regulate the adaptation that universities have carried out in order to teach their training processes originally in person (Sunedu, 2020).

Regarding the technological resources available to Peruvian students to carry out remote sessions, the INEI (2020) reports that only 7 out of 10 Peruvian households have radio and 8 out of 10 have television. On the other hand, if we talk about Internet access and devices, 62.9% of homes in Metropolitan Lima have Internet and 52% have at least one computer. In rural areas, only 5.9% of households access the internet and 7.5% have a computer, while 74.3% of the population aged 6 to 17 uses a cell phone, compared to Metropolitan Lima that reaches 84.9%, including that the cell phone is the main means of accessing the Internet.

METHODS

This research was carried out using a qualitative approach, in which understanding is generated based on the analysis of data collection within a given context (Shaw, 1999). In

addition, it has a prospective design, since it focuses on the current period marked by having sui generis conditions typical of the pandemic and its effects. For this, content analysis has been used, which aims to interpret what is written in the documents (Ruiz, 2012) and in which it is used as an observation method, which was oriented and directed by the objectives proposed in the present investigation.

ANALISYS OF RESULTS AND DISCUSSION

Environmental sustainability generates contradictory paradigms between countries, this being a socio-economic issue that deserves to generate development approaches that are considered ideal, taking into account the global problems, which as a planet we are facing, however, in order to achieve that, they have been outlined jointly between governments, guidelines and objectives that will guide decision-making in Peru through public policies in order to achieve concrete results raises Agenda 21; Within this context, one of the great factors to take into account is the social aspect, which must be based on citizen participation, since organized residents are not are the key actors in this process, therefore, promoting it and taking them into account for sustainable local planning is essential (García-Montes and Arnanz, 2019). Various experiences carried out in Latin American countries coincide in the relevance that authorities and representatives also have, in their management power with tangible and intangible resources (Ruiz-C et al., 2018; Zenck, et al., 2018; Meléndez, 2018; Meléndez, et al., 2017; Ojeda, 2019; Aedo and Gumucio, 2020).

Taking into account the aforementioned elements, within the present pandemic scenario, in which daily routines and activities have been altered by the restrictions of confinement and social isolation, displacements were reduced to the maximum during the first months, with the education sector being one of the most affected in that sense. The actors involved had to rethink their activities and the way to execute them, leading to habits change when they were permanently at home, turning this space into their home, school, university and work center, in the case of teachers, increasing by for example, the consumption of domestic electrical energy and the production of solid waste, despite having less use of transportation in general, pollution was reduced.

In this regard, the report of the Ombudsman's Office (2020) mentions that from the municipal solid waste generated in Peru, in the months of the pandemic, 70% correspond to households. Regarding the consumption of electricity, according to the report by Olade (2020), the electricity demand of the residential sector increased, this increase has originated due to teleworking, as well as the intensive use of devices at home, throughout the day. Finally, regarding air pollution, Narain (2020) argued in a World Bank report that Nitrogen Dioxide (NO2) levels decreased markedly throughout the world during confinement, however this decrease in NO2 levels does not imply because people are exposed to lower levels of harmful pollutants, one of the most dangerous forms of air pollution is the fine PM2.5 particles that can penetrate deep into the lungs and enter the bloodstream, leading to deadly diseases such as lung cancer, strokes and heart disease.

It is pertinent to specify that environmental sustainability is strongly linked to economic, social and political factors, which frames the government policy governing each of the countries, proposed in the millennium objectives and these in turn in the objectives sustainable development to 2030 in order to advance together.

It is determined that the population is the main actor in the continuous use of natural resources and biodiversity, which generates an environmental imbalance affecting natural disasters affecting vulnerable populations. In addition, the active participation of the various actors during the environmental management process should be a priority at all levels.

Regarding education, it is a right, which in turn must be exercised with high quality standards due to the importance it represents in the formation of generations and therefore, non-face-to-face education is an alternative that should not be underestimated, and that within the pandemic context, it should mark the route to restructure the educational model with a view to generate greater inclusion in the medium and long term.

CONCLUSIONS

In conclusion, environmental awareness should be generated in the population through the promotion and development of projects that generate impact in the community, which allows generating the dissemination of sustainable practices based on the use of resources (1) water, (2) renewable or ecological energy and (3) ground, oriented to the well-being of people and the environment, as an integrated system. Education being an important element in the process, promoting synergy between various actors: government, population and students, adapting to the new changes and contexts that society faces during the pandemic.

Promote environmental sustainability based on government regulations, prioritizing natural resources and biodiversity as a source of life for current and future populations.

REFERENCES

Aedo MZP, Gumucio CP (2020). Public officials and environmental evaluation in Chile: tensions in the construction of a democratic environmental governance. Mex. J. Polit. Soc. Sci. 65(239): 379–393.

Arias J (2017). Fair sustainability as a systemic environmental paradigm. Manag. Environ. 20(2): 232-243.

Asumadu SS, Adams S, Asantewaa OP, Leirvik T, Ozturk I (2020). Mitigating degradation and emissions in China. The role of enviromental sustainability, human capital and renewable energy. Sci. Total Environ. 719(1): 1-14.

Augusto M (2018). When the State and society converge: the construction of territorial policy in San Martín (2002-2018). Debates Sociol. 47: 9–39.

Augusto MMC, Dargent E, Rousseau S (2017). Beyond state capacity: civil society and implementation of policies at the subnational level in Cusco and San Martín (Peru). Colombia Int. 90: 99–125.

Castillo OG (2019). Environmental education towards sustainable development. https://revistas.ujat.mx/index.php/hitos/article/download/3626/2771/18750.

Castillo-SantaMaría B, Villanueva ACE, Moreno SRA, Aguero AHL (2020). National agrarian policy in Peru: Effectiveness of public management approaches. Venezuelan Manag. Mag. 25(89): 55-65.

De la Rosa LME, Hernández GP, Vega CMA (2020). The mining industry and its sustainability approach in Mexico. Latin Am. J. Res. Organ. Environ. Soc. 11(16): 175-200.

De Las Heras GD, Adame MS, Cadena VEG, Campos AJ (2020). Spatial analysis of the urban environmental sustainability index in the megalopolis of Mexico. Geogr. Investig. 73: 147-169.

Durán R (2015). Virtual University Education as a means to improve generic skills and learning through good teaching practices. [Doctoral thesis Universidad Politécnica de Catalunya, Barcelona, Spain] https://www.tdx.cat/bitstream/handle/10803/397710/TRADR1de1.pdf?sequence=1&isAllowed=y.

FAO (2010). FAO and the eight millennium development goals. Objective 7 proposes to guarantee environmental sustainability. 1-2. Retrieved from http://www.fao.org/3/a-az955s.pdf

García F (2020). Reference model for non-face-to-face teaching in face-to-face universities. http://eds.a.ebscohost.com/eds/pdfviewer/pdfviewer?vid=4&sid=dd0a653b-e7dd-4471-b08a-b5156814242d%40sessionmgr40066.

García L (2017). Distance and virtual education: quality, disruption, adaptive and mobile learning. https://www.redalyc.org/pdf/3314/331453132001.pdf.

García-Montes N, Arnanz ML (2019). Participatory methodologies for planning local environmental sustainability. The case of Agenda 21. EMPIRIA. J. Soc. Sci. Methodology. 44: 109-133.

General Law of the Environment (2005). Obtained from http://www.minam.gob.pe/wp-content/uploads/2013/06/ley-general-del-ambiente.pdf.

Government of Peru. (March 15, 2020). Emergency Decree No 026-2020. Laws. Lima Peru. Retrieved from https://cdn.www.gob.pe/uploads/document/file/566447/DU026-20201864948-1.pdf.

Juca FJM (2016). Distance education, a necessity for the training of professionals. Magazine University Soc. [online series]. 8(1): 106-111.

Limón-Domínguez D (2019). Eco-citizenship. Challenges of environmental education in the face of sustainable development goals. Pedagogical Issues. 29: 126-127.

Minedu (2020). R.M No. 160-2020-MENEDU. Disponen el inicio del año escolar a través de la implemenacion de la estrategia denomidada "Aprendo en casa", a partir del 6 de abril de 2020. El Peruano, págs. 9-10. Obtenido de https://cdn.www.gob.pe/uploads/document/file/574684/disponen-el-inicio-del-ano-escolar-a-traves-de-la-implementa-resolucion-ministerial-n-160-2020-minedu-1865282-1.pdf.

Minedu (2020). R.V. No. 085-2020-MINEDU. Orientaciones para la continuidad del servicio educativo superior universitario. págs. 1-11. Obtenido de https://cdn.www.gob.pe/uploads/document/file/574842/RVM_N__085-2020-MINEDU.pdf.

Minedu. (2020). R.M No. 088-2020-MINEDU. págs. 1-24. Obtenido de https://cdn.www.gob.pe/uploads/document/file/574993/RVM_N__088-2020-MINEDU.pdf.

Narain U (2020). Contaminación atmosférica: confinada pero no detenida por la COVID-19. Recuperada de: https://www.bancomundial.org/es/news/immersive-story/2020/07/01/air-pollution-locked-down-by-covid-19-but-not-arrested.

National Institute of Statistics and Informatics (2020). Technical Report on the state of childhood and adolescence.

OECD (2016). Environmental performance evaluations, Peru. Highlights and Recommendations. ECLAC. Retrieved from https://www.oecd.org/environment/country-reviews/16-00313%20Evaluacion%20desempeno-Peru-WEB.pdf.

Ojeda T (2019). The Strategic Role of Local and Regional Governments in the Implementation of the 2030 Agenda: Experiences from South-South and Triangular Cooperation. Oasis 31: 9–29.

Ojeda T (2019). The Strategic Role of Local and Regional Governments in the Implementation of the 2030 Agenda: Experiences from South-South and Triangular Cooperation. Oasis. 31: 9–29.

Olade (2020). Analysis of the impacts of the COVID-19 pandemic on the Energy Sector of Latin America and the Caribbean. Retrieved from: http://biblioteca.olade.org/opac-tmpl/Documentos/old0452.pdf.

Ombudsman's Office (2020). Solid waste management in Peru in times of COVID -19. Recommendations to protect the rights to health and the environment. Lima: Ombudsman's Office.

ONU (2015). https://www.un.org/sustainabledevelopment/es/wp-content/uploads/sites/3/2016/10/11_Spanish_Why_it_Matters.pdf.

Ruiz CRI, Román-Valencia C, Gonzalez-E CH (2018). Review of environmental management on the territory and climate change in the department of Quindío, Colombia. Manag. Environ. 21(2): 163–176.

Ruiz J (2012). Metodología de la Investigación. Universidad de Deusto. Bilbao.

Sacristán G (2020). Cómo hacerle frente a la crisis del Covid-19 con la Agenda 2030. Desafío para el progreso. Banco Interamericano de Desarrollo. Obtenido de https://gestion.pe/blog/bid/2020/05/como-hacerle-frente-a-la-crisis-del-covid-19-con-la-agenda-2030.html/?ref=gesr.

Sadi AH, Príncipe NS, Uzuner G, Victor BF, Asumadu SS (2020). Trivariate modelling of the nexus between electricity consumption, urbanization and economic growth in Nigeria: fresh insights from Maki Cointegration and causality tests. Heliyon. 6(2): 1-9.

Santángelo H (2000). Modelos pedagógicos en los sistemas de enseñanza no presencial basados en nuevas tecnologías y redes de comunicación. Revista Iberoamericana de Educación. 24(1): 135-159.

Sarah-Lan M-S, Mulanovich AJ, Jaquet S, Bieri S, Lojas J, Masserli P, Breu T (2020). Estableciendo una interfaz ciencia-gestión-sociedad para la conservación de la biodiversidad y el bienestar humano en la Amazonia: el caso de Madre de Dios, Perú. Ecosistemas. Revista Científica de Ecología y Medio Ambiente. 29(1): 1-10.

Shaw E (1999). A guide to the Qualitative Research Process: Evidence from a Small Firm Study. Qualitative Market Research: Int. J. 2(2): 59-70.

Sunedu (2020). R.C.D. No. 039-2020-SUNEDU/CD Criterios para la supervisión de la adaptación de la educación no presencial, con carácter excepcional, de las asignatutras por parte de universidades y escuelas de posgrado como consecuencia de las medidas para prevenir covi. págs. 1-6. Obtenido de https://www.sunedu.gob.pe/resolucion-del-consejo-directivo-n-039-2020-sunedu-cd/.

Zenck HMDC, Urrutia PC, Ríos IR (2018). Sustainable development as public policy. Case of the Decentralized Autonomous Government of Quito. Reg. Cohes. 8(3): 45–69.

Zman K, Abd-el MM (2017). Energy consumption, carbon dioxide emissions and economic development: Evaluating alternative and plausible environmental hypothesis for sustainable growth. Renew. Sustain. Energy Rev. 74: 1119-1130.