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Artículos científicos

Museos interactivos de ciencia e innovación de Jalisco y su compromiso con la comunidad ante la COVID-19

The interactive science and innovation museums of Jalisco and their commitment to their community in the face of COVID 19

Os museus interativos de ciência e inovação de Jalisco e seu compromisso com a comunidade em face do COVID 19

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Los museos de ciencias son tan dinámicos como la ciencia, son instituciones culturales que cambian sus métodos y objetivos frente a la sociedad.

CABRAL y MALDONADO (2019, p. 3)

Resumen

En este artículo se presenta un análisis del proceso de adaptación ante la crisis sanitaria por la COVID-19 de los dos principales museos de ciencia, tecnología e innovación de Jalisco: Museo Trompo Mágico y Planetario Lunaria, con el objetivo de fortalecer la cultura científica y la apropiación de la ciencia. Para ello, se utilizó una metodología cualitativa basada en el análisis de los documentos de planeación de ambos museos, así como en visitas guiadas a ambos recintos. Entre los principales hallazgos, se encontró que estos museos de Jalisco, como ha sucedido en el resto del país y a nivel internacional, han tratado de mantener comunicación con los usuarios a través de sus plataformas digitales, a la par de llevar actos de forma híbrida, presencial y virtual, cuando las autoridades lo han permitido, con la



intención de seguir interactuando con diferentes comunidades, tomando en cuenta la seguridad de los museos y el bienestar de su personal y de su audiencia. Sin embargo, para fortalecer la cultura científica, la apropiación de la ciencia y la promoción de las vocaciones científicas en los niños y los jóvenes, no hay que perder de vista la vinculación de estos espacios con la educación, y apoyar los procesos de educación formal y no formal con la intención de contribuir a la misión de los museos de preservar, recopilar, investigar, interpretar y comunicar su patrimonio tangible e intangible, así como la transmisión de conocimientos.

Palabras claves: COVID-19, cultura científica, museos, planetarios.

Abstract

This article presents an analysis of the process of adaptation to the COVID-19 health crisis of the two main science, technology and innovation museums in Jalisco: Museo Trompo Mágico and Planetario Lunaria, with the intention of strengthening the scientific culture and the appropriation of science. For this purpose, a qualitative methodology was used based on the analysis of the planning documents of both museums, as well as guided visits to both sites. Among the main findings, it was found that these museums in Jalisco, as has happened in the rest of the country and internationally, have tried to maintain communication with users through their digital platforms, while carrying out hybrid events, face-to-face and virtual, when the authorities have allowed it, in order to continue interacting with different communities, taking into account the safety of museums and the welfare of their staff and their audience. However, in order to strengthen scientific culture, the appropriation of science and the promotion of scientific vocations in children and young people, we must not lose sight of the link between these spaces and education, and support the processes of formal and non-formal education with the intention of contributing to the mission of museums to preserve, collect, research, interpret and communicate their tangible and intangible heritage, as well as the transmission of knowledge.

Keywords: COVID-19, scientific culture, museums, planetariums.



Resumo

Este artigo apresenta uma análise do processo de adaptação à crise sanitária pela COVID-19 dos dois principais museus de ciência, tecnologia e inovação de Jalisco: Museo Trompo Mágico e Planetário Lunaria, com o objetivo de fortalecer a cultura científica e a apropriação da ciência. Para este fim, foi utilizada uma metodologia qualitativa baseada na análise dos documentos de planejamento de ambos os museus, bem como visitas guiadas aos dois locais. Entre as principais constatações, verificou-se que estes museus em Jalisco, como aconteceu no resto do país e internacionalmente, tentaram manter a comunicação com os usuários através de suas plataformas digitais, ao mesmo tempo em que realizavam eventos de forma híbrida, presencial e virtual, quando as autoridades o permitiram, com a intenção de continuar a interagir com diferentes comunidades, levando em conta a segurança dos museus e o bem-estar de seu pessoal e seu público. Entretanto, para fortalecer a cultura científica, a apropriação da ciência e a promoção das vocações científicas em crianças e jovens, não devemos perder de vista a ligação entre esses espaços e a educação, e apoiar processos de educação formal e não formal com a intenção de contribuir para a missão dos museus de preservar, coletar, pesquisar, interpretar e comunicar seu patrimônio tangível e intangível, bem como a transmissão de conhecimentos.

Palavras-chave: COVID-19, cultura científica, museus, planetários.

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Introduction

Museums of art, science, technology and innovation are spaces that house the heritage of humanity and have been born closely linked to training processes (Brizzi and Fruniz, 2020, p. 7).

Since 1946, at the international level, there is an International Council of Museums [ICOM, for its acronym in English] (2020a), created with the intention of being an articulating and promoting body of museums, archaeological sites and historical monuments.

Mexico has a great tradition and has created more than 126 venues. After Brazil, where more than 270 museums and science spaces have been reported, it is the leader in the field in Latin America. In this regard, the document Methodological Synthesis of Museum Statistics of the National Institute of Statistics and Geography [Inegi] (2018) offers a general overview of the process for the generation of museum statistics carried out in Mexico. It



includes from the collection of data in museum institutions to the generation of different products for the dissemination of statistical information. In addition, it highlights the description of the objectives of the collections, as well as the characterization of the visitors and the coverage through the various media to extend their exhibitions.

The first statistical information that was published on museums was in 1930, it only referred to 18 states, it was relative to centers (museums), busy personnel and visitors; In the yearbooks from 1935 to 1938, data were also included on the type of objects on display, as well as the number of visitors according to their origin; and from 1954, information was collected regarding the thematic coverage of the exhibition (Inegi, 2018, p. 1).

In another report also published by Inegi (2019) it is reported that there are more than 1,177 museums and art and culture centers registered in the 32 entities of the Mexican Republic.

Now, Mexico City, Nuevo León, Puebla, Guanajuato and Jalisco are five of the states that register the most museums in Mexico. And as for the influx of visitors, a variable undoubtedly dependent on the number of museums registered in each federal entity, "Mexico City [leads] with 30.5 million in 136 museums, followed by Nuevo León with 11.2 million in 45 museums" (Inegi, 2019, p. 4); while Jalisco registers 1,963,342 in 75 museums, having a significant influx of visitors.

Another very salvageable data from the statistics shown by Inegi (2018) is that most of the visitors to museums are students of upper secondary and higher education, who attend in compliance with extracurricular activities, those whose objective is the dissemination and dissemination of science and culture.

This type of historical, art, science and technology spaces allow, through their collections, a social appropriation of science and culture, which contributes to the cultural strengthening of the country, as well as the promotion of scientific vocations in children and youths. In other words, science and culture are integrated into society and awareness is promoted and the generation of technological and innovation skills is promoted.

According to Cabral and Maldonado (2019), museums include "works of art, experiments, videos, interactive games spaces where young people and children verify that science can also be entertained through manual activities prepared for the public that visits them." (P. 3). It is important to generate a greater popularization of science and culture,

especially by linking schools and universities, as well as various scientific associations, to increase activities that stimulate in students a taste for research and scientific careers and technological.

Thus, museums and cultural centers are important spaces for preserving human knowledge and for social transformation. They are part of the cultural and scientific infrastructure of the countries, since through them it is possible to investigate, communicate, exhibit and exhibit various collections. However, the global crisis due to the health emergency as a result of COVID-19 has caused mandatory social distancing and the closure of most spaces for social coexistence. Museums have been severely hit and have had to reinvent themselves and explore new forms of communication through virtuality and the development of activities remotely. As a result of this reconversion process, they now have a greater digital presence, either through their web pages, where they show their collections, or through social networks, where they establish greater interaction and dialogue with users, which has allowed them to continue their efforts to disseminate and disseminate science, and continue to act as mediators between culture and society itself.

In this regard, based on a survey of museums on the five continents, ICOM (2020b) highlights the following:

In April [2020], almost all museums in the world closed due to the COVID-19 pandemic, according to 94.7% of those surveyed.

During the closure, many museums increased their digital activities. Although almost half of the respondents answered that their museum was already present on social media or shared their collections online before the closings, the digital communication activities analyzed by the survey increased for at least 15% of museums and, in particular, social media activities increased for more than half of them (p. 2).

In this same context of the pandemic caused by the new coronavirus, and also based on a series of surveys directed at "leaders, middle managers and directors of museums, cultural centers and self-managed cultural initiatives in Mexico," the Institute for Museum Leadership [ILM], in conjunction with the National Autonomous University of Mexico [UNAM] (May 27, 2020, p. 1), underlines the importance of collaborative work and distance communication within institutions:

They have taken courses, created groups of messages, devised meetings to exchange ideas, not necessarily focused on work. Communication has been essential, resources such as video meetings, phone calls and emails have been used. Empathy and trust are the most recognized virtues to promote closeness with the team. As well as respect work times and show real interest in their mood, their health and that of their families (p. 8).

In Jalisco, according to the information collected through the Ministry of Culture (2021), the Ministry of Innovation, Science and Technology (2021) and the State Council of Science and Technology of Jalisco (2021), there are two main interactive museums that promote innovation, science and technology: the Magic Trompo Museum and the Planetarium and Interactive Center of Jalisco Lunaria.

These two enclosures, like 95% of the museums in the world, have been affected by the current health emergency that we are experiencing (Unesco, 2020). Therefore, it is important to look for alternatives and implement hybrid models, face-to-face and virtual, so that they continue to be linked with their audiences, that promote creativity and continue to be that bridge between culture and society.

Finally, Brizzi and Fruniz (2020) mention that “education is also very important for us to 'reinvent' ourselves, to generate a change in our outlook, in our way of thinking and understanding the museum, valuing the role of the education in museums and educational departments" (p. 5)

Methodology

The main objective of this study is to analyze the adaptation process to the health crisis caused by COVID-19 of the museums of science, technology and innovation Jalisco Trompo Mágico and the Lunaria Planetarium with the intention of strengthening the scientific culture and the appropriation of the science.

The recommendations of Hernán, Lineros and Ruiz (2020) were taken into account to carry out qualitative research, who opportunely warned that “the confinement of the population, including the researchers, highlights the need to adapt the qualitative methodology, its techniques and tools, to the current context generated by COVID-19 ”(p. 298).

Thus, a phenomenological qualitative methodology was used and the analysis of planning documents, the information contained in their web pages, communication sites such as Facebook and following health and government regulations was used as a technique.

Due to its type of study, it is an exploratory and cross-sectional research whose categories of analysis were the following: 1) mission of interactive museums, 2) main activities to continue interacting with their audience in times of pandemic and 3) challenges and lessons learned from the health emergency.

Results

The spaces for the dissemination and dissemination of science have been strengthened in the state of Jalisco with the creation of two interactive museums. First, it was the Magic Top, which opened its doors on April 30, 2003. It is an educational and museum project whose main mission is to promote science and technology with special emphasis on children and adolescents.

He does very important work on a social level through recreational and science activities. Among the programs of this institution, the following stand out:

- Observation Center for Minor Offenders.
- House of Intermediate Passage.
- Pediatric Service of the Hospital Civil de Occidente.
- Llave Cosquillas, which invites children with risky diseases (cancer, acquired immunodeficiency syndrome [AIDS], kidney failure) to visit cultural and entertainment venues in Jalisco at no cost.

It also stands out for being part, since 2004, of the Mexican Association of Museums and Science and Technology Centers (AMMCCyT), which brings together the main institutions and technological avant-garde centers in Mexico, as well as ICOM.

The museum has its own website (www.trompomagico.com) and has created almost 90% of the educational software it exhibits. He has a Facebook page (<https://www.facebook.com/trompomagico/>) with more than 68,174 followers. And a YouTube channel, where various webinars have been broadcast that explain in a playful way the care of children in times of COVID-19 and the variants of the coronavirus and its threats to the world.

It is important to mention that on March 16, 2020, in a statement from the Ministry of Culture of Jalisco, the suspension of activities for cultural centers, libraries and museums was announced due to attention to the health emergency and to avoid contagion among the population. (Gómez, March 16, 2020); Just over a year ago, on March 18, 2021, they reopened their doors with a hybrid format, paying attention to health protocols, with a “program of training and entertainment experiences to cultivate resilience and solidarity, after the period of social distancing one year after being closed due to the health contingency caused by COVID-19 ”(Government of the State of Jalisco, March 18, 2021, para. 1).

Among the main challenges facing the Museo Trompo Mágico in the face of the current pandemic are:

1. Give priority to a hybrid face-to-face and virtual programming.
2. Adhere to the solidarity return program established by the Ministry of Culture and the Government of the State of Jalisco.
3. Promote the exchange of collections with other interactive museums in the country.
4. Increase alliances with national and international museums to learn about and apply good practices in these difficult times of crisis.
5. Maintain closeness with your audiences by increasing digital content through the programming of your YouTube channel and your publications on Facebook.
6. Improve the technological resources available to expand their content and collections.
7. Take care of and maintain its facilities so that it can be attended to adequately and in accordance with the protocols established by the Ministry of Health.

For its part, the Lunaria Planetarium opened its doors on December 2, 2018. Lunaria succeeded the Severo Díaz Galindo Planetary Science and Technology Center, inaugurated on December 18, 1982; occupied and equipped its facilities to make science and technology known in a playful way to the population of Jalisco. In official words, its mission is, based on the experience of the planetarium, "to create critical scientific knowledge for visitors, interested, not interested and fans of knowledge" (Planetarium and Interactive Center of Jalisco Lunaria, s. F.).

Lunaria is a space that allows us to discover the value of science and its application in our daily lives. It makes periodic invitations so that educational institutions can visit it and also offers its facilities so that colloquia and cultural events can be held.

As part of its activities for the social appropriation of knowledge, it offers scientific and experimental workshops for the general public and for science fans on topics such as robotics, animation, laser cutting and 3D printing, as well as a laboratory for physics experiments, chemistry and biology. In addition, it opens the doors of its public park for the residents of the planetarium to join in and develop activities such as urban gardens, photographic and artistic exhibitions, reading clubs, information sessions, among others (Planetarium and Interactive Center of Jalisco Lunaria, s. F.). Finally, another of the main attractions of the planetarium is the area where a unique projection dome in Latin America is housed.

The institution in question also carries out interactive activities through its website (<https://www.planetariojalisco.com/conoce-lunaria/>) and its Facebook profile (<https://www.facebook.com/PlanetarioLunaria/>).

Faced with the current health crisis, the planetarium reopened its doors in a hybrid way on February 18, 2021 and, following the health measures established by the authorities and by appointment to have a controlled capacity and avoid contagions, it again received visitors.

Its activities include colored stars, countdown to fly to Mars, astronomy in two minutes and the animation of Jupiter. Its website has more than 46,629 followers, displaying topics and online workshops on science, innovation, as well as exhibitions on astronomy, biology, mathematics, physics, chemistry, ecology, and engineering.

In the Lunaria statements issued during the coronavirus pandemic, the solidarity of the museum members with the people who have become ill and lost a family member due to this pandemic stands out; gratitude to the health personnel for their dedication and work, and for the help shown by the residents of the neighborhood attached to the Planetarium.

Likewise, through online content, the dissemination of science has continued: news, videos, events, curious facts, interviews, live broadcasts, webinars for the classroom, among other content (Planetarium and Interactive Center of Jalisco Lunaria , sf).

In this case, the main challenges are the following:

1. Continue strengthening and diversifying its collections in person and online.



2. Create new strategic alliances with planetariums and interactive museums at the national and international level.
3. Continue to strengthen ties of solidarity with the community and higher education institutions that visit the planetarium.
4. Seek alternative sources of financing for the maintenance of its equipment, infrastructure and collections.
5. Strengthen your work team through continuous training and a culture of quality in service.
6. Adhere to government regulations for a solidarity and risk-free return.
7. Maintain the facilities with a strict control of safety and hygiene measures.

Discussion

The COVID-19 pandemic has disrupted the activities of museums around the world, threatening their financial survival, as well as the livelihoods of thousands of museum professionals. In fact, there is a risk that some of them will be forced to close permanently. Undoubtedly, museums and cultural institutions or heritage management institutions in general should have promoted a more coordinated internal dialogue that allowed reorganizing agendas that, in some cases, provided for perfectly structured activities for the whole year (Brizzi y Fruniz, 2020, p. 2).

As established by Unesco (4 de abril de 2020):

Around the world, museums and the communities they belong to are feeling the impact of COVID-19, as populations have been asked to stay home and large gatherings of people are prohibited.

(...) It is estimated that 90% of the approximately 60,000 museums in the world are forced to close their doors totally or partially. Regardless of size, location, or situation, museums face tough challenges, including protecting their collections, ensuring the safety and health of staff, solving financial problems, and maintaining engagement with their public. Museums are contributing to our societies, coming up with innovative ideas and inspiring everyone in these difficult and uncertain times.

In addition to this, in order to better understand the situation that museums have faced in recent months, it is worth citing the work of the Network of European Museum

Organizations (NEMO) (cited in EVE Museums and Innovation, 1 October 2020), which documented and analyzed the economic impact that the pandemic was causing, while showing us the opportunities in the digital context that museums have taken advantage of and from which they are still making the most of it. The NEMO found that, indeed, museums and cultural centers have been significantly affected by closing their doors: they now have less budget to cover their expenses and, by extension, fewer staff; Despite this, they have tried to continue to be linked with their audiences, especially taking into account social networks and placing their collections online.

Also, within the museums of Spain, there is the case of the Museum of Fine Arts of Asturias, which has implemented a series of hygienic-sanitary measures in order to provide the greatest protection in order to carry out its activities under adequate prophylaxis conditions. and be able to open in a hybrid way (Museo Bellas Artes de Asturias, s. f.).

In Latin America, various investigations have been carried out with the intention of being able to know the general expectations of museums and the new dynamics of action during the pandemic and those expected in the post-pandemic period, their role in society and their incidence in the community (Ibermuseos, 2020, p. 15).

The recovery of the museum's place in society in the face of this new global reality and its role with its community should be one of the priorities (Ibermuseos, July 9, 2020).

In Colombia, very important information was also obtained in this regard. As part of the Museum Strengthening Program, the National Museum of Colombia (2020) carried out the Colombian Museums and Pandemic survey, the results of which delineate the effects within Colombian museum institutions.

A good summary of the situation experienced by museums in this health contingency is presented by Ibermuseos (2020):

At first, it is clear that the main concern of museums has been to adapt to the virtual universe - be it adopting teleworking, be it seeking to offer online content and dialogue with its environment - later, a change in data behavior showed that, beyond the presence in digital media, institutions began to worry about working more strategically towards more sustainable solutions and actions in the medium and long term (p. 3).

At the moment, emphasis is being placed on the possibilities of using new technologies as facilitators of free choice learning, which gives museums an important role

(Correa and Ibáñez, 2005, p. 8). Currently, like the museums that we have analyzed in this study (Trompo Mágico and Planetario Lunaria), these types of venues are offering online content and innovative strategies in response to the coronavirus crisis..

Conclusions

Interactive science, technology and innovation museums strengthen and promote scientific culture and the dissemination of science. They are spaces for the social appropriation of science. Due to the current COVID-19 pandemic, these venues have had to transform, modify and strengthen their collections in a virtual or hybrid way. The Trompo Mágico Museum and the Lunaria Planetarium have faced the great challenge of approaching their audience through playful and interactive multiplatform materials: YouTube, Facebook, online conferences and colloquia, among others, as well as continuing to maintain their facilities, equipment and support to its administrative, technical and managerial staff so that they continue in operation despite the social and health crisis.

Among the findings found, the value of linking through networks of mutual support that allow the exchange of their collections, as well as good practices, capable of generating resilience and proactivity, so that these venues continue with this noble and important work of promotion of scientific vocations, interest in science, technological development and innovation.

Future lines of research

The results obtained here encourage broadening the study to interactive museums in the western region of Mexico, which includes, in addition to Jalisco, the states of Nayarit, Michoacán, Aguascalientes and Colima. And expand investigative techniques with interviews and site visits.

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