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Travelling science centers and museums: paths to citizenship and engagement under the eye of professionals

Débora Teixeira dos Santos e Menezes
deboratsmenezes@gmail.com
orcid.org/0000-0003-2028-2255
Fundação Oswaldo Cruz (FIOCRUZ), Rio de Janeiro, Rio de Janeiro, Brasil

Diego Vaz Bevilaqua
diego.bevilaqua@fiocruz.br
orcid.org/0000-0003-4822-4874
Fundação Oswaldo Cruz (FIOCRUZ), Rio de Janeiro, Rio de Janeiro, Brasil

Douglas Falcão Silva
douglas@mast.br
orcid.org/0000-0001-6158-9566
Museu de Astronomia e Ciências Afins (MAST), Rio de Janeiro, Rio de Janeiro, Brasil

ABSTRACT

The purpose of this paper is to investigate travelling activities by Brazilian science centers and museums from a 2020 survey sample. The study is justified as it tries to amplify access to science for a diverse and representative spontaneous audience. The theoretical framework and analysis covers the perspective of science communication, social inclusion and citizenship. Data gathering was performed in two stages with the participation of professionals who work at these institutions. During the first stage, a questionnaire was used and in the second stage interviews were held. Due to the COVID-19 pandemic and WHO guidelines with respect to social distancing, both steps were held online. Response analysis used a descriptive statistic and qualitative/quantitative analysis of the content in accordance with the Bardin method (2009). 27 participants were taken as the sample cut who indicated the travelling activities in both the closed and open questions in the questionnaire. Eight participants mentioned the itinerancy spontaneously in the interviews. The results were separated by subject: professional profile, participants' geographic distribution, targeted audience residence; the qualitative/quantitative analysis of the reports and other aspects of the survey. In general, a diversified approach to the travelling activities was reported, as well as the importance of establishing partnerships that provide access to new members of the public and afford a contextualization of the experience provided by the museums. The main reasons for the aforesaid absence were related to the institutions exogenous aspects. Furthermore, when the activities were part of a long-term commitment, it was possible to observe the construction of a legacy that could break through structural social inequalities. Further studies are necessary to access the level of satisfaction in relation to the experiences provided from the point of view of the public who participated in these activities. However, the results have shown the importance of rethinking a public policy plan for the long-term that provides science communication activities in a consistent continual way, and which is capable of augmenting the impact of these present travelling activities.

KEYWORDS: Science communication. Science centers and museums. Travelling activities. Local communities. Social inclusion.

INTRODUCTION

The socio-economically vulnerable public, in general, is little represented among the spontaneous attendance (COIMBRA et al., 2012) at the science centers and museums. Despite the access inequality, few public studies have investigated this theme, as in general, the same are focused on the audience that already frequent these spaces (Dawson, 2014a).

Within the Brazilian context, a group of researchers from the Museum of Astronomy and Other Sciences (Museu de Astronomia e Ciências Afins – MAST) were one of the pioneers in investigating the absent public for the purposes of increasing participation from a broader selection of the population to be among the visitors to the institution on weekends (CAZELLI et al, 2015; FALCÃO et al., 2010). The authors highlighted that the format at present focused on the demands of the public who already frequented the institutions yet knew nothing about those who did not. In order to know whether the actions implemented would be relevant in the context of public policies for social inclusion, the meanings attributed to the visitors' experience were investigated.

The results of these studies indicated that, although the stimulated visits to MAST were of value and associated to the cognitive empowerment, the same was not observed in a social aspect as this empowerment in relation to improving people's daily lives. Furthermore, the empowerment was restricted to the moment of the stimulated visit, and not incorporated in the social and cultural habits of its participants. The authors associated this fact to the low cultural capital, when taking into consideration the public's profile, and pondered the accumulated cultural capital in the incorporated state needed to be "imprinted and assimilated, costing time that should be invested personally by the investor (such as sun tanning, his incorporation cannot be done through proxy)" (BOURDIEU, 1999, p. 72).

The change in the profile of this audience within the informal educational activities facilitated by the science centers and museums are still a challenge. Therefore, this research is justified in that it looks for a way to make the science centers and science museums to be frequented by a more diverse public, contributing to rethink the social role of these institutions. One of the largest barriers against inclusion to the broader population are the locations of the science centers and museums, which in Brazil follows a pattern of geographic inequality at all levels. That apart from being concentrated in the South and Southeastern regions (FERREIRA, 2014), they are also concentrated in the richest cities and within these cities in the most noble or touristic areas. As such, the socially vulnerable public is kept away by both physical and cultural barriers, to which adding the continental dimensions of the country ratify the role of the itinerant activities in promoting greater access.

The purpose of this paper is to discuss the aspects of the travelling activities and social inclusion, identified from the sample taken from the 2020 study. On the occasion, it was investigated the approach of the frontline professionals at the Brazilian science centers and museums and their established rapport (or not) with the public of social vulnerability living within the institutions' local communities. Accordingly, the itinerant activities were seen as a strategy to reach out as much to the public within the institutions' local communities as those from other

municipalities. This study was carried out under the premises of science communication, science engagement and citizen rights in search of ways to reduce social inequality and encourage access to these environs.

The sample cut is analyzed using a qualitative/quantitative methodology, the purposes of which are: to identify how many professionals report on the travelling activities directed specifically at socially vulnerable individuals; to identify the aspects associated with this approach, such as the territories where they are held, what criteria was used for their execution and who were the actors involved in the itinerant processes, and finally detail the aspects and meanings attributed to this approach.

THEORETICAL FRAMEWORK

The perspective of science communication, science engagement and citizenship constitute the theoretical basis of the work, for the purposes of rethinking the social role of the institutions in the form of inclusive practical museology and help in the diversification of the public who spontaneously visit the science center and science museums. When the vulnerable socio-economic public is mentioned, it refers to those who do not have access, or only precarious access to basic services provided by the state, such as education, basic sanitation, health and transportation (BONETI, 2006). Furthermore the 'public from the territory' (SCHEINER, 2020) of the science center and science museums, refers to people who live within the contiguous space, where the museum is a revelant actor (BEVILAQUA et al, 2020).

According to Scheiner (2012) this is the "greatest ethical museological expression: museums become inclusive spaces - a place for all, absolute *"agora"*, where the most different communities can, finally, recognize each other and hold hands" (SCHEINER, 2012, p. 29, our translation). The inequality of access to the science centers and science museums by the more diverse layers of the population is not only a Brazilian phenomenon, but also a Latin American, (DAZA CAICEDO et al, 2017), a United Kingdom, a United States and Canadian one (ARCHER et al, 2016), where the attendees are mostly white, urban and middle class, and the authors conclude "the structure of the museums fail to address the difference" (ARCHER et al, 2016, p. 919).

This is a point of concern, once within contemporaneous society, technology has invaded all existential dimensions, scientific knowledge is important for people to be autonomous and participate in the group and exercise their rights as a citizen (ARCHER et al, 2015, 2016; CASTELFRANCHI; FERNANDES, 2015; CASTELFRANCHI, 2010). Castelfranchi (2010) highlights the public communication of science role for the layman. This is more than just the scientists' moral obligation it is a social duty, as scientific knowledge and citizenship are rights that all citizens may demand. However, in a stratified society, not only is access but also interest or awareness of the importance of this knowledge is extremely unequal.

It is the consensus among researchers in the area, and gathering evermore evidence, that only formal education doesn't have the capacity to prepare the citizen to participate actively the techno-scientific society. Within this environment, the science centers and science museums can exercise their social

role in disseminating knowledge, socialization, interactivity and promote discussions and take actions to attract the present absent audience in scientific outreach (ARCHER et al, 2015; CASTELFRANCHI, 2016; CAZELLI et al, 2015; DAWSON, 2014a; FALCÃO et al, 2010).

Dawson (2014a) analyses how new practices can collaborate in the idea of science for all instead of science for some. Even though the theme has been considered relevant, the conversion of the concepts idealized to put them into practice is more complex and does not always achieve the expected results. Based on previous studies and theoretical references about social justice and reproduction of inequalities (BOURDIEU, 1999, 2004) and about critical pedagogy (FREIRE, 1970, 1997), the author elaborated a model for access, equality and inclusion based on 3 pillars: access to infrastructure, literacy and community acceptance.

The question of access involves location, entrance fee, physical access, yet considered also other hidden costs, such as the profile of the participants normally considered in the strategic release to the public of the museum and its criteria in recruiting teams. Even when the institutions have social representational mechanisms, like committees, one asks how much the minorities are really listened to or whether authority is really shared.

Dawson (2014a) also takes into consideration whether social participation is related to questions of identity especially class, ethnicity and gender. According to Bourdieu (1999), the cultural and educational institutions continue reproducing inequalities, by increasing cultural capital for a privileged group in society and limiting access to less privileged groups. In its turn, how much have the science centers and science museums adopted policies and reproduced a system of social disadvantage through lack of access? She cites precise projects that do not alter the profile of the attendees, as they normally take into consideration the objectives of the museum, without considering the aspirations, motivations and needs of the public they wish to include.

Some initiatives analyzed portray, in their exhibitions, non-dominant groups in an irrelevant or distant cultural form, as a way of reproducing symbolic violence. Bourdieu (1984) associates them, for example, to dominant group in the culture, which imposes a mutual admiration verdict, while the conditions and instruments for their execution are unknown to the greater part of the public. The author says "when considering the structures, see the importance of the absences" (BOURDIEU, 1984, p. 257). Thus, it is essential that the science centers and science museums reflect over their policies and recognize the difference throughout the unequal distribution of access so that significant respectful experiences can be apportioned and that they represent in a relevant way non-dominant cultures.

The highlighted literate questions are broad and multifaceted, linked to the *habitus* of knowing how to make the most of the visit. Not always are the elaborated apparatus are accessible to those who do not possess previous knowledge or social position to know "what to do". This includes implicit questions in design, like how to stand in front of a camera to start a mechanism; how to also consider aforesaid questions of literacy, from those associated with previous scientific knowledge to understand an exhibition, to socioscientific questions in which science is inserted or associated in a social, political and cultural context.

One should take into consideration fundamental literacy and the use of the language in itself, including for immigrants who are not fluent in English, for example, which do not find a translation into other languages.

The absent cannot be understood to be deficient, nor "illiterate", but as the fruit of a disadvantaged situation. They are a reflection of past choices, many of which were instigated by the institutions on instilled suppositions, which reveal the differences of power among social groups, and are immersed in the structure and policies of the science centers and science museums. The suppositions about: previous scientific knowledge, other contents and ways of learning revealed a dominant form of interpretation and communication, determined "whose knowledge matters, whose practices matter and, in the end, who matters" (DAWSON 2014a, p. 226).

The author addresses the difficulty in representing science, which is possibly the reason for presenting risk-averse science, and the universal truth of scientific knowledge, even when controversial themes are presented. The historic tales of the white man, from the upper classes, that materialize scientists such as Newton and Darwin lose the opportunity to show science and scientists in a more open, inclusive and normal way. She restates that the exhibition environments may favor different forms of learning, as constructive pedagogy precognitions. It proposes to think in alternative, critical and multicultural ways, incorporating humility when choosing who to represent, which stories to tell and which languages to use.

The third aspect of the approach proposed by the author, community acceptance, takes place in two ways, both by the museum, by recognizing, accepting and receiving new audiences, and by the community, by recognizing the museum as a place where it is worthwhile spending their time. Although it is a two-way street, the first step depends on the institution, through awareness, respect and the representation of difference, providing a critical reflection on the role of power in the practices in question. The importance of this community approach to developing long-term relationships is highlighted, which involves a commitment of time, resources and collaborative ways of working, including recognizing boundaries and working partnerships with other institutions in order to act to transform social problems.

The various barriers mentioned influence the current profile of the science centers and science museums' spontaneous visitation audience, and are already known in the field. Access and distance barriers are the main drivers of roaming projects, such as those of the “Mobile Science” type. Though these are the main barriers they are not the only ones. According to Bennett (1995), the cultural barrier is the most observed when the reasons for not participating in science centers and science museums are investigated. Dawson studies (2018, 2014a, b, c) and Archer et al. (2016, 2015) bring theoretical and empirical contributions to the discussion. Albeit held in the United Kingdom, they study racial minorities’ experiences in science museums and calculate the effects on how much change is necessary to make it more inclusive. The authors emphasize structural, multiple and interconnected questions, which contribute with making these spaces, today, truly partially public.

Dawson (2014c) writes that the barriers help to analyze exclusion; however, it does not explain nor orientate policies for inclusion. This is because it is not enough

to “resolve” one of the barriers and be inside the museum, for the public to feel included. But yes, as institutions continue to reproduce their *modus operandi*, the dominant cultural practices, knowledge and values that in general do not recognize the cultural practices, knowledge and values of those groups which are not dominant. Despite the efforts of some professionals, visits and programs aimed at minorities are usually marked by subtle symbolic violence (BOURDIEU, 1984, 1999), sometimes being perceived as tokenistic or ‘assimilationist’. As the literature reveals, cultural institutions collaborate more to reproduce social disadvantages than to break them, and they can even further alienate the public they wish to attract.

The author argues that the approach to barriers reveals a double deficit. The first, assumes a lack of interest in science on the part of the public, based on their non-participation in the science communication activities. The second considers that non-participation is a passive choice, being enough, then, to remove barriers to promote changes in behavior. This approach does not dive into the reasons why people do not participate in this type of activity and may even perpetuate social exclusion. The challenge for researchers, professionals, funders and public policy makers is how to understand and address the complex, multiple and structural issues involved in exclusion.

Feinstein (2017) recognizes the involvement of museums with the aim of reaching these new audiences, and cites a “creative explosion” (FEINSTEIN, 2017, p. 536) of activities that can influence the future and innovation in institutions, which consist of itinerant practices. Inspired by libraries, maker spaces and environmental justice organizations, each proposal escapes the model of the typical science museum, as it incorporates different concepts of learning and science. They take place in cafes, on street corners, in parking lots or in natural environments in varied activities such as watching live comedy shows, engaging in live debates, making traditional crafts, planting gardens and collecting water samples.

The author considers that science museums need to change, in response to the constantly changing world, and highlights the role of researchers, who can act in different ways as partners in this transformation. Exploring and sharing good practices that empower professionals, developing participatory research based on interaction with communities and actions that identify and defend systemic changes in public policies and promote science museum funding.

> Those who wish to make equity a guiding principle for the future should understand that it leads them, sooner or later, to a fundamental choice about what they do, about what science learning means for museums, and what it means to “see for yourself, know for yourself”. (FEINSTEIN, 2017, p. 5).

Projects that happen on a one-off basis, such as travelling museums, have the role of expanding access to science communication activities, but how can they be transformed into broader changes?

> Developing inclusive science communication practices may require critically assessing current practices, perspectives and motivations in combination with a concerted call to action that places equity at the heart of science communication, rather than on the periphery (DAWSON, 2014c, p. 3).

Returning to Brazil, Wanderley (2001) describes the difficulties in delimiting exclusion, due to the multiple factors that promote this phenomenon, especially in this country where different causes of poverty and social exclusion coexist, which contribute to the excluded group not being homogeneous.

> Excluded people are not simply rejected physically, geographically or materially, not only from the market and its exchanges, but from all spiritual riches, their values are not recognized, that is, there is also cultural exclusion (WANDERLEY, 2001, p. 17–18, our translation).

For the author, consolidation of democracy in the country implies denaturalizing the ways in which discriminatory practices are approached, as these also generate the exclusion process.

Boneti (2006) researched the discourse of the poor and non-poor in Brazil, and the notions of inequality, inclusion, exclusion and poverty. The studies carried out by the author reveal that the notion of equality was not defined by the majority, but part of the pattern established by the dominant classes, in which "the equal assumes the position of command, not to say dominant, or at least superior, over the different" (BONETI, 2006, p. 198, our translation). For the non-poor, the notion of inequality is based on their individual capacity to access social goods, public services, cultural capital, etc. For the poor population, being outside the poverty line is having access to civil rights.

The dominant group associates the "poor" with a condition of permanent being and not temporary being by eliminating their ability to escape this condition makes them even poorer. This aspect does not appear among the poor. For the author, when the parameter of access is considered, the thinking associated with remaining within poverty is radically changed, as the poor face the impossibility of access - to health, education, transport, security, leisure and jobs – in contrast to the monopoly of this access by the ruling classes. Therefore, when it comes to inclusion, both the exclusivity of access to public goods and services by the middle and upper classes, as well as the inefficiency of policies and public services in fighting it, are swept under the carpet.

Carmo (2016) analyzed the discursive linguistic universe present in the descriptions of the word "tolerance" in Michaelis, Caldas Aulete, Houaiss and Ferreira Brazilian Portuguese dictionaries. The author presents the historical origin of studies on the subject, who dates back to the 16th century, and the modern principle of tolerance developed in the 18th century. It retrieves the roles of State and Church institutions, which were unified with certain goals, and on these occasions, many times gained power through violence. So, religion and its role as evangelizer and ideological catalyzer justified the actions of the state. In turn, empiricist and Enlightenment theorists proposed ideas around tolerance based on respect for difference in the religious context and the importance of a secular state to guarantee peace among individuals of different beliefs and opinions. However, the etymological analysis found a tense and conflicting inter-subjective construction of the term:

> Those who cannot stand the difference need to disguise or hide their negative feelings towards others so as not to suffer lawful sanctions (...) they only tolerate the different, do not respect them as equals, demonstrating pseudo-

> democracy in the Brazilian context (CARMO, 2016, p. 212 –213, our translation).

The study revealed that differences are supported, yet never truly became part of the legitimate options of a society that claims to be plural and democratic. The use of the term "tolerance" presents an inconsistency, a false pacific condition, by hiding conflicts among groups that remain tense, excluding and supporting each other. This use is, in fact, an anchor for prejudice, discrimination and physical and symbolic violence, which originates in the ideology of one group's alleged superiority over another, to the detriment of diversity and difference present in society.

Travelling Projects and Social Inclusion

Travelling projects in science museums have a long history, the first one recorded was in the 19th century, but it is from the 1950s onwards, with a set of UNESCO actions, that the number of projects grew, in particular those of itinerant museums, which use their own vehicles to transport their collections and exhibitions to remote places (ROCHA; MARANDINO, 2017, SOARES, 2016). The main motivation for creating these projects was the need to expand the reach of traditional museums, to audiences that did not have access. With the emergence and expansion of interactive science centers, "Mobile Science" projects, which use specialized vehicles to transport interactive equipment to cities far from large centers, also expanded.

In Brazil, museums and science centers are concentrated in large urban centers, so that a large portion of the population does not have the opportunity to visit them in the city where they live. In the study on Public Perception of Science and Technology in Brazil, released in 2019 (CGEE, 2019), only 6.3% of Brazilians declared they had visited a science museum in the last 12 months, and among those who did not, 34 % said it does not exist in their region, 11% do not know where this type of museum is and 8% declare that this type of museum is too far away. In this sense, access barriers are real and limit participation of a large portion of the population to this type of cultural equipment. The itinerant projects of science museums, in particular travelling projects, seek to overcome this barrier and provide educational and leisure opportunities to these populations.

In Brazil, there are records of travelling science museum type vehicles since the 60s (ROCHA; MARANDINO, 2017, SOARES, 2016), however, it was with the creation of the travelling museum project (Projeto Museu Itinerante – PROMUSIT), from the Pontifical Catholic University of Rio Grande do Sul (PUCRS), in 2001, that the movement became more apparent (FERREIRA et al., 2012; ROCHA; MARANDINO, 2017; SOARES, 2016). Due to the vast Brazilian territorial and marked regional inequality, the use of vehicles as a way of expanding science popularization activities allowed for greater territorial coverage and development of social responsibility initiatives (FERREIRA, 2014). After the 2004 Mobile Science Public Call, the number of vehicles adapted for travelling museums in the country multiplied. Launched by the Brazilian Academy of Sciences (Academia Brasileira de Ciências - ABC) and sponsored by the Ministry of Science and Technology (Ministério da Ciência e Tecnologia - MCT), the Call received 48 applications and 9

projects were selected (FERREIRA, 2014; ROCHA; MARANDINO, 2017) in order to ensure that all Brazilian regions were covered (ROCHA; MARANDINO, 2017).

In the latest Science Centers and Museums guide (CENTROS..., 2015); published by the Brazilian Association of Science Centers and Museums (Associação Brasileira de Centros e Museus de Ciência - ABCMC), Casa da Ciência and Museu da Vida, 32 Mobile Science activities in operation in the country were mapped. Despite reporting a significant increase, from 20 to 32 projects since the previous edition of the guide, in 2009, the number is still considered to be insufficient to guarantee an expansion in the scope of the projects.

> The Mobile Science project mode has been fundamental for the internalization of activities and actions to popularize science around the country (...) it has been shown as an alternative for reaching, mainly, places where there are no cultural facilities dedicated to the popularization of science. (CENTROS..., 2015, p. 292, our translation).

"Pop Ciência 2022", a program presented by ABCMC in the context of IV National Conference on Science and Technology 2010, proposed:

> Implementation of 40 Mobile Science type projects, guarantee a network with centers in all Federation Units with roaming capacity to all municipalities of each state. A majority of them are in the North, Northeast and Midwest regions, ensuring an internalization of actions (CENTROS..., 2015, p. 292, our translation).

There is no up-dated study on the number of projects of this type in operation, but it is known that, since 2016, the political and economic crisis in Brazil has caused a sharp decrease in the funding of science communication and few new projects have been created. The last study found, Rocha & Marandino (2017) list 34 projects in operation, consequently, the expectation of having at least one action per state by the year 2022 can hardly be achieved.

The importance of these initiatives, in a society marked by privileges, extreme inequality, injustice and social exclusion should also, due to the nature, specificity and scope of their actions, contribute to the awakening of critical awareness at a local level, as well as develop a feeling of positive self-esteem in relation to its national and state heritage, symbolic and cultural base for a virtuous cycle of scientific and technological development. Travelling museums, in their conception, seek to contribute to the socio-cultural inclusion of less privileged populations, in addition to meeting the demands of the current information society: the establishment of programs to foster continuous learning, to the consolidation of a scientific culture, as well as to the valorization of the Brazilian cultural production. According to Gonzalez and Alves (2019):

> [...] travelling exhibitions or mobile units are adopted by some museums as a strategy for the popularization and interiorization of science in regions where scientific, cultural and educational equipment is scarce (Gonzales;Alves, 2019, p. 197, our translation).

Whereas Ferreira et al. (2012) states that:

> Given the large number of people they reach and the power to internalize public access to scientific knowledge, these mobile units for popularizing

> science are, in general, highly efficient in terms of allocated investments (FERREIRA et al, 2012, p. 136, our translation).

Melo et al. (2020) found the interest of young people in science in the context of science communication in astronomy, when fifth and sixth year students attributed an approval rate higher than 98% to the experience of a session. The authors highlighted the importance of the experience for the training of explainers, physics course students, in the interaction with different audiences as an opportunity to develop skills that are difficult to assimilate in formal education (COELHO, 2014). Certain skills acquired in extension are not usually assimilated in the formal teaching experience (through subjects), such as: ability to interact and organize teamwork (especially multidisciplinary ones); knowing how to listen and knowing how to communicate in front of diverse and different audiences from those who circulate in the academic environment.

Rocha and Marandino (2017) point out that there is not much research into itinerant actions, neither in Brazil nor the world. Little is known about its social impact beyond empirical reports, and despite the present dialogical discourse, many of these actions end up in practice reproducing the deficit model. Similarly, the question is:

> [...] the interiorization efforts in fact democratize access to scientific knowledge, if there are legacies and, if so, what would they be after a four-day stay in the municipality. Even so, we asked ourselves how the socio-historical context of the participating subjects in different dimensions would help to build something meaningful around this legacy (GONZALES; ALVES, 2019, p. 204, our translation).

It is, therefore, necessary to expand investments in research, both to investigate the public's and actors' who participate in itinerant actions perceptions, in order to better understand the role of itinerant projects in a broader concept of social inclusion promoted by the centers and science museums and their respective social impact.

METHODOLOGY

The research, used as the basis for this analysis, aimed at investigating the dialogue developed by science centers and museums with the socio-economically vulnerable public within the territory of the institutions, from the perspective of professionals from the Brazilian science centers and science museums. As there was no similar research to base the methodological decisions on, the conceived strategy sought to initially identify an overview of the aspects that could collaborate to the attraction or withdrawal of the socially vulnerable public. If they were performed, how they started and remained active over time and which actors and processes would be present. Subsequently, we sought to describe the identified aspects and the meanings involved, in order to deepen the knowledge related to such practices when there was open dialogue.

Data collection was performed in two steps. In the first step, we sought to compose an overview of the aspects under investigation from the perspective and professional experience of the participants. For this purpose, a questionnaire for anonymous data collection was applied. The results were analyzed using

descriptive statistics and the content analysis method as proposed by Bardin (2009). At the end of the questionnaire, the participant could indicate their willingness to participate in the second step of the research, consisting of an interview. In the second step, based on the interview results, the aspects identified in the first step would be explored and detailed. Due to the COVID-19 pandemic and WHO guidelines with respect to social distancing both steps were held online. The sample selection proposed here covered the 27 participants who, in the first step, indicated that activities were carried out with the socioeconomic vulnerable public, whether in closed or open fields, in addition to the results from eight interviewed participants. The methodological processes adopted at each step are detailed below.

First Step

During this step the study tried to gather data from the greatest number of participants. We sought to quantify the professionals who reported carrying out a dialogue with the socioeconomic vulnerable public and whether the practices took place or not from the perspective of science communication. Furthermore, to identify aspects of this approach, such as the geographical locations considered, actors involved and a general perspective on the satisfaction of the public participating in the activities offered, leaving space for spontaneous reports on the practices.

The elaboration of the online questionnaire took into account some precautions to increase the chances of participation and for its completion. A simple and colloquial language was used in a succinct form, the completion required the shortest possible time, around five minutes. The research instrument for this step was elaborated in GoogleForms in six sections. Initially, it presented a summary of the research, the Letter of Consent and asked if the potential participant agreed to participate. The following section made it possible to validate the sample, asking whether the participant had a professional activity in a Brazilian science center or museum. If not, an acknowledgment was presented, and the study ended. If so, the third section, “About You”, was presented, containing questions about the participant's professional profile.

The fourth section, "About the Science Museum and the Visiting Public" allowed us to identify whether approaching the vulnerable public was part of their professional practice, by asking whether the institution in which the participant worked carried out in social activities in socially vulnerable communities, three response options were offered: “Yes”, “No” or “Have in the past, but not currently”.

The fifth section, “About the Science Museum and the Socially Vulnerable Public”, presented two sets of questions, but in this article it is applicable to comment on the first model, for those who answered “Yes”, whose questions were: if the participant considered the popularization of science the main objective of the actions carried out; the location of the residence of the public participating in them, the possibility for the participant to comment more on the actions taken, in an open field; how many people worked directly in the activities, even if part-time and, in the participant’s opinion, what would be the public’s assessment of actions taken.

The sixth section, “Research Evaluation and Closure”, asked: if the research contributed to the reflection on social inclusion in science centers and science museums; over the field for additional comments; should participants be willing to participate in an interview on the topic, and, if so, the phone number, the best time to call and finally the email if the participant who wants to receive the study results. After sending the form, a thank you message for participation was presented. In summary, the questionnaire had 21 questions, 14 closed and seven open. The close questions were mandatory, except for those in the last section of the evaluation. Among the open questions, only three were mandatory, those presented in the first section, relating to the professional profile.

Data collection took place between 23rd of July 2020 and 30th of September 2020 with participation from ABCMC, which sent two invitations to its contact list, on 24th July 2020 and 5th August 2020. The link on the questionnaire webpage was also shared in WhatsApp groups or targeted email messages to professionals working in Brazilian science centers and science museums, including the network of contacts from the researchers. The responses to the questionnaire were linked to the Google Form spreadsheet, which was later exported to Excel.

The sample collected in this step had 79 answers, where 10 were removed due to three situations. The first one deleted four records, related to potential participants who did not work in science centers or science museums; the second identified five additional records from the same participant, with identical answers sent at different times. The third situation followed when sending two answers, by the same participant, being identical closed answers and whose different open answers were combined into only one register.

The analysis of this first step considered 69 participants, of which 48 carried out activities in socially vulnerable communities. Of these, 20 answered that they carried out travelling activities in the closed question elaborated for this purpose. Answers to closed questions were analysed according to the descriptive statistics, which gave rise to sample data relating to professional profile, geographic distribution, and residence of the public who participated in the activities. This analysis divided the participants into two groups (A and B), according to the geographic location of the activities being the same as the institution or just in other locations.

Open questions were coded and categorized from the methodological procedure for content analysis proposed by Bardin (2009). After formatting the spreadsheet fields, the document containing the answers to the questionnaire was imported into the MaxQDA program, converting the respective records into 69 documents, one for each participant. Open answer fields were converted into paragraphs of these documents, and closed answer fields were imported as quantitative variables. A process of codification and qualitative/quantitative analysis was carried out, which revealed the frequency of the expressions used, highlighted in the reports. From there on, it was possible to quantify and group the codes into four Themes related to the aspects identified in the approach to the socially vulnerable audience: Public, Geographic location, Science Communication (SC) Approach and SC Actions.

Part of these codes was converted into variables, allowing for crosschecking with quantitative data and aiding to corroborate or discard hypotheses. This

process incorporated new elements and perspectives of the approach to the target audience and facilitated identification of seven new individuals who spontaneously reported itinerant actions, in only the open fields of the questionnaire. The initial groups were reorganized into three new Categories: 1, 1A and 2, which respectively refer to professionals who report their itinerant actions within the territory of the institution, only in other territories and those who focused on schools.

The sample cut in the first step considered 27 participants who answered "Yes" to carrying out activities aimed at public in socio-economically vulnerability and reported carrying out travelling activities, either in the closed or open questions of the questionnaire in the first step phase of the research, which received the codes.

Second Step

In the second step of the study, interviews were conducted using as a collection instrument a semi-structured script. The purpose was to explore in greater depth the aspects identified in the first step opening up to capture new aspects relevant to the study.

Due to the isolation measures recommended by the WHO during the period in question, the interviews were carried out online preferably through a free version of the Zoom software. Defining the sample of potential participants was intentional and based on segmentation criteria. The purpose of this choice was to the specific units of study (and) have of those that generate the most relevant and abundant data, considering their theme of study" (YIN, 2016, p. 100). The sample content, therefore, was not random, but sought to include a sufficient scope to avoid any partiality or bias that would confirm the assumptions of the researchers, including participants whose reports could presumably research questions" (YIN, 2016, p. 298), with the aim to provide wealthy relevant information.

The invitation plan during this step began initially with 35 participants (51% of the total) who indicated in the first step questionnaire their interest in participating in the interview. The criteria adopted in giving priority to invitations of regional dimension, to include voices of professionals from different regions of the country, whether from capitals or non-capitals, the details of the reports from the first step of the research related to the different locations and category approaches under analysis. Application of the criteria resulted in an initial list of 17 potential participants, who were invited and scheduled little by little, until the ten planned interviews, within the scope of this step was reached. For this reason, two invitations were not sent. Fifteen invitations were sent by email or WhatsApp, respecting the preferred contact channel chosen by the participant. Of these, five did not result in an appointment, as four did not answer and one thanked us for the invitation, but said he was not available for participation as his agenda was full.

The semi-structured script was used as a collection instrument and began by reading the Letter of Consent and a declaration of the intent to know aspects of the participant's professional experience and that the interview did not seek to an institutional representation. The script started with "icebreaker" questions, which asked the participants to inform their main responsibilities and accomplishments.

Subsequently, the participant was asked his/her opinion about the importance of the approach with the socially vulnerable people within the local communities, and whether this approach should be part of a science center or science museum mission. Emphasis was placed on exploring the motives for starting the activities, their inflection point, and which actors influenced their realization. We sought to better understand the audiences addressed, the types of actions carried out, how they were evaluated and whether these actions had as their main objective the popularization of science. On this last point, there was an interest in understanding whether the institution approach would be restricted, for example, to instrumental professional training for low specialization work (such as gardening), social assistance actions (Christmas baskets), or if it would be committed to public communication of science and the development of a techno-scientific citizenship (CASTELFRANCHI, 2010; POLINO; CASTELFRANCHI, 2012).

The interviews were held between the 13th November 2020 and the 3rd December 2020, the average interview lasted 1 hour and 11 minutes, the shortest being 39 minutes and the longest 1 hour and 45 minutes. A recording of one of the interviews was inadvertently interrupted and had no backup. Consequently, in order to maintain the standard treatment of the collected data, the interview from this participant was not included in the analysis. The program MaxQDA was used in the codification, categorization and qualitative/quantitative analysis.

When asked questions about their professional practices and activities aimed at the socio-economically vulnerable public, among the nine participants in the second step, eight spontaneously mentioned carrying out travelling activities. Two of them had not indicated in the questionnaire during the first step their activities aimed at the socioeconomic vulnerable public, but, in the interview, one of them shared his/her participation in activities to popularize science, in partnership with a non-governmental organization, and another mentioned loaning didactic material to schools. The material gathered and related to the sample clip totaled 10 hours 52 minutes and 44 seconds of recordings and 117 pages of transcription.

The research was approved by the Research Ethics Committee of the Escola Politécnica de Saúde Joaquim Venâncio, FIOCRUZ, RJ under CAAE 28906720.9.0000.5241 in assessments issued on the 14th May 2020 and on the 11th November 2020.

RESULTS

According to the criterion adopted for the sample cut, of the individuals who indicated activities aimed at socio-economically vulnerable public and travelling activities in their answers to the questionnaire's closed questions, 20 participants were selected. In the reports in open fields, new aspects of this approach were seen, including seven participants who initially had not indicated itinerant activities in the closed field. Thus, considering also the information in the open fields, 27 participants indicated travelling activities aimed at the socio-economically vulnerable public, of whom work in 23 institutions.

In the following paragraphs, the results will be presented by research aspect, first professional profile, next geographic distribution of the sample and the residence of the public, identified in the closed questions of the questionnaire.

Then, each Theme identified in the qualitative/quantitative analysis of the open fields will be addressed and complemented by the interview reports. Finally, reports that help to describe other aspects under investigation will be shared.

Professional profile of the participants

As shown in table 1, most participants are experienced civil servants, with more than six years professional experience. The response "Employee" refers to people working under Brazilian Local Labor Legislation. "Management" and "Education" are the most mentioned departments, whereas "Multiple areas" groups those who declared working in more than one area, without mentioning management. In "Others" events, communication and teaching were mentioned. Coordination position is the most numerous, followed by Research and Direction, and, in "Others", reception, events and teachers were mentioned. Most teams have four or more people, where it has been said that these may vary depending on the occurrence of projects. The response "N/A" refers to "Do not know/ do not want to answer". The questions asked during the first step of the questionnaire were: P3: How long have you worked at the institution?; Q4: What is your type of connection with the institution?; P5: In which area of the institution do you work?; Q6: What is your role in the institution? and P15A: How many people work directly with this(these) activity(ies), even if part-time?

Table 1 – Professional profile data from the Questionnaire Online Travelling – 1st Step

Type of engagement		Experience		Department		Position		Team size	
Civil servants	21	6 years or more	20	Manage-ment	13	Coordi-nation	11	4 people or +	17
Employee	5	3 - 5 years	6	Education	5	Research	4	2 - 3 people	7
Scholar-ships	1	1 - 2 years	1	Research	3	Manage-ment	3	Variable	2
				Others	3	Education	3	N/A	1
				Inclusion activities	2	Muse-ology	3		
				Multiple areas	1	Others	3		
Total	27	27		27		27		27	

Source: The authors (2021).

Geographic distribution of participants

Twenty participants reside in cities that are capital cities and seven reside in non-capital cities. Fourteen different cities were mentioned, of which eight are capitals and six are not. The participants' residences are distributed throughout 11 states and four regions of the country, as shown in the map in figure 1. The Southeast Region is the most frequent (17), driven by the state of Rio de Janeiro, followed by the South (4), Northeast (4) and North (2) regions. The conclusion of these regions where the participants reside was given by the question Result of P.7: Which state do you live in?

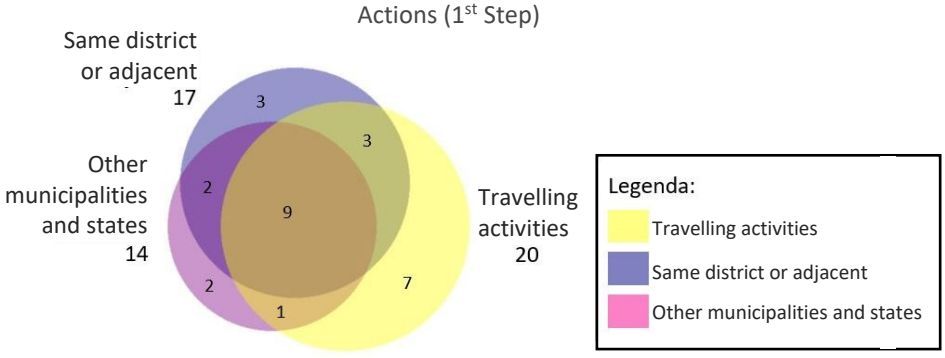
Figure 1 - Distribution of Participants by State - Sample Cutting (1st step)

Source: The authors (2021).

Residence of the public from the activities performed

The place of residence of target audience by activities carried out by the science center or science museum was asked in a closed question, allowing check more than one option. A sample of 27 individuals, were cross-checked in an Excel dynamic table, to identify any subsets results from a combination of different approaches to the territory. Although it is not possible to extrapolate this result to the universe of practices under study, the answers reveal different approaches to the locations in relation to the activities performed by participants' professional background, aimed at the minorities. This analysis is presented in Figure 2, was performed using the Biovenn platform available at www.biovenn.nl. Question 13A) was asked. This(ese) activity(ies) is(are) performed for the residents who live: In the same district or neighboring district of the institution; Is it a travelling action; Other districts and states.

Figure 2 - Distribution of the Target Audience's Residence into Subsets - Travelling Actions (1st Step)



Source: The authors (2021).

Qualitative/quantitative Analysis - Themes

The qualitative/quantitative analysis of the answers to the open questions of the questionnaire resulted in the grouping of codes into Themes, as shown in table 2.

Table 2 - Themes and Codes of the online questionnaire – 1st Step

Theme	Code	Partici-pants (n=26)	Codi-fied Seg.	Total	Over-all total
Public	Government schools in vulnerability	10	10		
	Socially vulnerable people	7	7		
	Partnerships	6	7		
	Schools, middle school or undergraduate	3	3		
	Government schools	2	2	29	
Geographic location	Vulnerable Location	9	9		
	Local communities with socio-economically vulnerability	6	8		
	Cities with low HDI or little access to culture	6	6		
	Public spaces	4	4		
	State, other states, city, region	2	2	29	
Science Communication Approach	Science Communication themes	6	6		
	Action without Science Communication character	1	1	7	
Science Communication Activities	Travelling activities	17	24		
	Educational activities and events + formal	8	8		
	Events	3	3		
	Workshops	3	3		
	Health awareness or environment education	2	2		
	Collaborative processes	2	2		
	Loan of educational collection or exhibit	1	1		
	Others	2	2	43	108

Source: The authors (2021).

Schools are mentioned as the public for travelling actions by 15 of the 27 participants. A part of these associate them with mostly public schools, and others reports cite those “in places considered "dangerous" or "less favored"” (PARTICIPANT 51, 2021). The criteria revealed that giving priority to public schools, with low IDEB (Brazilian Index for Educational Development) or vulnerable public schools, yet also educational institutions in general are mentioned (Schools, Middle Schools or undergraduate).

Among the nine participants of the second step of research, eight spontaneously mentioned in the interviews the travelling activities providing access to scientific content where people are, enabling beyond the walls activities as a means to carry out social inclusion. In the interviews, schools or actions linked to formal education are the main focus of the activities. However, other arrangements and partnerships were mentioned, not necessarily linked to formal education, which have been developed in the institution's or other's locations.

Partnerships are highlighted as an essential factor in enabling access to new audiences, as well as sharing elements that offer a contextualized experience “It is necessary to seek partners, partners are important” (PARTICIPANT 48, 2021). Various partners were mentioned, such as rural boarding school, and welfare centers of reference, community associations, sponsors and Memory Points, however, in both steps, most participants place greater emphasis on partnerships with educational institutions, teachers and Education Departments.

One participant mentioned a partnership with local schools and other museums on a project in which young people visit this museum and another museum, chosen with the schools. The motivation for the format comes from the restricted situation of young people who live in vulnerable communities, where urban mobility is limited by socioeconomic conditions. The activity offers transport and snacks, on a route guided by a specialist in the city's history. As such, the expansion of horizons is perceived through an opportunity to appropriate urban space:

> 93% of those who participated had never entered a museum before. And so [...] if he enters only [Museum 1], his only reference will be [Museum 1]. So, [...] if he enters only [Museum 2], his only reference will be [Museum 2]. Now, if he's been in both, he'll surely understand that the third will be completely different. Which is good for him, because he will understand that [Museum 1] is very easy, he will understand that [Museum 2] is very easy and then, any other is easier. [...] I remember an 18-year-old boy, passing by Sugarloaf, in tears, because he had never seen Sugarloaf. He was born in *Bangu* [...]. So, I mean, it's not that everyone has to visit Sugarloaf Mountain, but Sugarloaf Mountain, it is an important icon of the city. So, if you know Sugarloaf Mountain, it's yours. That's what makes him a citizen, that's what makes him love the city he lives in. (PARTICIPANT 58, 2021).

In the Geographic Location Theme, the locations mentioned for carrying out the activities were grouped, with emphasis on the institution's location in vulnerable areas, including outskirts, favelas, communities, squares and parks (Public spaces), other neighborhoods and the interior of the state. Projects carried out in partnership with non-governmental organizations from both within the institution's geographic location and other districts, even other states were mentioned. In the interviews, indigenous and *quilombola* communities and other community spaces were also mentioned, in activities carried out on the premises of partner institutions, and shopping malls, prisons, restaurants and events such as Global Actions and Book Fairs.

In Science Communication Theme, reports were identified on the role of institutions in popularizing knowledge, through "projects that encourage the enchantment of science to the general public" (PARTICIPANT 23, The authors, 2021) and the inclusion of the public distanced from museums:

> We also tour in squares and parks, where we are able to have contact with people who do not feel "welcome" at the museum, either because of their socioeconomic status or because they are unaware that a museum is not only a place for cultured people and a high level of education. (PARTICIPANT 51, The authors, 2021).

Only one participant in the sample mentioned carrying out an activity in which science communication was not the main objective, training in gardening, offered on the institution's premises. In the interview, the action was contextualized within the main objective of promoting appropriation of space, bringing the institution closer to the local community. The Science Communication Activities Theme mentioned activities, whose main objective is the popularization of science, the actions in “Others” refer to the observation of stars and digital inclusion workshops.

Other aspects of the study

With respect to the investigation related to the appraisal of activities, the questionnaire identified high public satisfaction with the activities offered, being considered good (13) or excellent (12), only two participants did not evaluate them. This perception was confirmed in the interviews, and the evaluations of the visits were mentioned as the main means used for this verification. From the point of view of the participants, the actions promote public engagement with science: "I think the child, has the interest. She often doesn't have the opportunity" (PARTICIPANT 16, 2021) and are capable of awakening new horizons, and the potential to open doors. Among those who maintain consistent activities over a five to ten year period, there are reports of building a legacy and new perspectives on life.

> In fact, there are people from our team who are now employees of the [Museum] and who were from the [Project] (...) there was a student who entered the technology studio, then graduated, like others in the community (...) and is already doing a master's degree. (PARTICIPANT 16, 2021).

Another point that confirms this perception is related to everyday observation, in which the experience is as more valued as the greater the vulnerability of the public, in special to children, who seek to make the most of the opportunity for entertainment, interactivity and learning. “Children freak out/love them” was a statement by four participants, among other thirteen similar reports, expressed by seven participants in the second step.

Another evidence of this engagement is that the itinerant activities were identified as motivating the scheduling of future visits to the science center/museum headquarters, which in this case offers transport and snacks to visitors: “we saw this very closely, having participated in the meeting of native communities, we started to receive calls from people saying “look, I want to participate, how can I?”” (PARTICIPANT 27, 2021). One science center/museum reported using a van, even a very old one, as this was the only way to carry out travelling activities in remote locations, which can also show both the importance of proactive action in promoting mechanisms for access and interest, by the public, to receive such itinerant activities.

The eight participants determined the main barriers of access and distancing from the public to aspects extrinsic to the institutions, such as space, urbanization and socioeconomic issues, mentioned in five interviews, or issues of identity and cultural capital, mentioned by seven individuals. Museums are associated with elite spaces, generally uninviting entrances:

> And we know that there are some spaces that have what we call invisible box office. That despite being free, people do not enter, because they do not feel invited and welcomed to enter and often even feel prevented from entering, because there is a security guard at the door, or because it is a very imposing space. (PARTICIPANT 13, 2021).

One aspect mentioned in 36 reports from six respondents is the importance of being proactive: “It's no use just opening the door, because sometimes the person won't enter. So, it is necessary to take the museum to them" (PARTICIPANTS 48, 2021).

DISCUSSION

It is worth considering that Brazilian science centers and science museums are more present in South and Southeast regions of the country (CENTROS..., 2015), generally in the richest cities and, within these cities, in the noblest or touristic areas (FERREIRA, 2014). The “double deficit” described in Dawson (2014c) is not observed in the participants' practice. The first aspect, related to the science centers and science museums' assumption that the public has no interest in science, otherwise they would visit the museum, which contrasts with the different reports that ratify the interest in the experiences provided because, in fact, “what is missing is opportunity”. In this context, it is observed that the engagement with the proposed experiences and the acceptance of the institutions by the community are present, which confirm the importance of a long-term commitment to promote changes capable of breaking with current pattern of social inequalities (DAWSON, 2014a).

The second aspect of the “double deficit” was also not identified, once access barriers were removed, engagement was found. The main limitation for expanding access is associated with issues extrinsic to institutions, or of cultural capital and identity (BENNET, 1995; BOURDIEU, 1999; DAWSON, 2014a). This corroborates the importance of public calls and financing that enable activities and shows that they are efficient in terms of allocated investments (FERREIRA et al., 2012).

Difficulties are not identified in promoting engagement with science and appropriating knowledge in the experiences offered. There is strong evidence of the commitment of these professionals to a pedagogical approach primarily aligned with the museum of discovery and/or constructivism (HEIN, 1995), which takes into account the popularization of science (BAZIN, 1997) and the practice of critical pedagogy (FREIRE, 1970, 1997). The reports present a constant and active concern with providing the public with relevant, dialogic and contextualized experiences, as part of a process that seeks to constantly improve the experience provided to visitors.

For reasons related to access barriers, the reports emphasize the importance of reaching out to the public, since entry into the science centers and science

museums for a face-to-face visit is still considered “forbidden”. Even when admission is free or when the institution is located in the same neighborhood as the public, there are hidden costs to make a visit (DAWSON, 2014a), which is the high price of transport for this portion of the population.

The reports highlight the importance of long-term public policies that enable and place roaming activities in a context of broader and more continuous policies. Dawson (2014a) emphasizes that simple and random actions will not make a difference. Gonzales and Alves (2019) question whether there are legacies, and how the socio-historical context of the subjects, in different dimensions, participates in the construction of meanings about this legacy, when there are locations that receive itinerant actions for only four days. And after?

FINAL CONSIDERATIONS

The theoretical references and data discussed here emphasize the importance of reaching out to the public, while respecting differences. The various itinerancy actions identified in the research are referred to as a means to promote access to science popularization activities. Actions of the Mobile Science type were mentioned, as well as arrangements involving partnerships and different locations, non-governmental organizations operating in the institution's territory, other districts, and may be present in favelas, prisons or shopping malls. Itinerancy in visits to partner museums was mentioned, which broadens horizons and promotes the appropriation of urban space by young people who normally live restricted to their neighborhood and do not have affective bonds with tourist attractions in the city itself. The main focus, however, is the partnership with formal education, through visits to schools, loan of collections or teaching materials.

More than access, the reports mentioned how effectively the aforementioned partners collaborate in providing engagement with the proposed activities. When a long-term commitment is made, they can contribute to the expansion of techno-scientific citizenship and come to constitute a legacy capable of breaking social inequality and changing life's perspectives.

Additional research is needed to deepen knowledge about the impact and reach of these initiatives for the democratization and appropriation of knowledge. It is important to investigate aspects from the perspective of the visiting public, as although a dialogic discourse is present, they may continue to reproduce the deficit model (ROCHA; MARANDINO, 2017). Researchers have a comprehensive role in the transformation process for a more equitable future in science museums (FEINSTEIN, 2017).

Another fundamental aspect is to place the travelling actions in a priority plan of long-term, more stable and continuous public policies, which can continue acting independently of governments, ideological or economic circumstances. The projects and public calls that encourage many of the activities in progress are fundamental, and could provide even greater impact if carried out in an integrated manner with a National Policy for the Popularization of Science. This should consistently cover each of the municipalities that receive four-day visits. How often would they happen? And what about those municipalities that were not covered by any project?

Presently, there is a lot of talk about a world after the COVID-19 pandemic. A considerable amount of everyday activities have migrated to the digital environment, an environment that continues to exclude the social-economically vulnerable public, whether for reasons of access, connection, device, or for the same cultural or identity issues that already exclude them from science museums visits. After overcoming the pandemic issues, it is urgent to rethink policies aimed at the long-term plan for scientific outreach, especially those aimed at the vulnerable public, which, for structural reasons, suffered more from the consequences of the COVID-19, in all dimensions of life, from health to formal and non-formal education and leisure.

Itinerância de centros e museus de ciências: caminhos para a cidadania e o engajamento sob o olhar dos profissionais

RESUMO

Este trabalho propõe investigar as atividades de itinerância realizadas por centros e museus de ciências brasileiros a partir de recorte amostral de uma pesquisa realizada em 2020. O estudo se justifica à medida em que busca ampliar o acesso às atividades de popularização da ciência por um público de visitação espontânea mais diverso e representativo da população. O referencial teórico e a análise dessa pesquisa, contemplam a perspectiva da divulgação científica, da inclusão social e da cidadania. A coleta de dados foi realizada em duas etapas e contou com a participação de profissionais que trabalham nas instituições. Na primeira etapa foi aplicado questionário, e, na segunda, foram realizadas entrevistas. Em função da pandemia Covid-19 e das orientações da OMS quanto ao distanciamento social, ambas as etapas foram realizadas online. A análise das respostas utilizou a estatística descritiva e análise qualiquantitativa do conteúdo, pelo método de Bardin (2009). O recorte amostral considerou 27 participantes que indicaram a realização de ações itinerantes nas perguntas fechadas e abertas do questionário, além de relatos de oito entrevistas nas quais a itinerância foi mencionada espontaneamente. Os resultados foram apresentados por assunto: perfil profissional, distribuição geográfica dos participantes, residência do público-alvo das atividades realizadas e análise qualiquantitativa dos relatos e outros aspectos da investigação. De maneira geral, revelam uma abordagem diversificada das atividades itinerantes e a importância do estabelecimento de parcerias que promovam o acesso aos novos públicos e colaborem na contextualização das experiências oferecidas. Os principais pontos de afastamento mencionados estão relacionados aos aspectos exógenos às instituições. Ainda, quando as ações refletem um compromisso assumido no longo prazo, os relatos citam a construção de um legado que rompe desigualdades sociais estruturais. Estudos adicionais são necessários para avaliar o impacto e a satisfação relacionados às experiências oferecidas sob o ponto de vista do público participante das atividades. No entanto, os resultados evidenciam a importância de se repensar um plano de políticas públicas de longo prazo, que fomente as atividades de divulgação científica de maneira contínua e consistente, e que seja capaz de potencializar o impacto das ações itinerantes hoje realizadas.

PALAVRAS-CHAVE: Divulgação científica. Centros e museus de ciências. Itinerância. Território. Inclusão social.

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Correspondence Address:
Débora Teixeira dos Santos e Menezes
Rua Gilberto Cardoso, 200, cep 22430-070 Rio de Janeiro, RJ, Brasil.