

**The role of science museums in scientific culture  
(Catavento, Sabina and Unicamp exploratory museum)**

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**Abstract**

There has been a visible increase in the Brazilian scientific academic production and industrial sector within the last ten years. This reality has been reflected in the making of national public policy to ST&I. Even though the national discourse points towards the strategic potential of ST&I for the development of the country, science and technology education still has a lot to improve. What would, then, the contribution of science centers and museums to Brazilian science education? Its characteristics and action towards a formation of a national scientific culture? How do the processes of establishment and management of these institution come about and how do they articulate with municipal public policies? In order to be able to understand these dynamics and the interface that museal institutions makes with educational, political, managerial and social sectors, the present research examines three different museums propositions, considering their educational and recreational aspects, as well as of managerial-financial nature. The selected institutions are located in São Paulo state, which concentrates most of the science resources and research. They are Catavento Cultural, Sabina Escola Parque do Conhecimento e Museu Exploratório de Ciências. Results shows the need of

improvement in managerial and financial areas; the relative importance of museums in science education; the small diversity of pedagogical actions with the public and teachers; the low usage of museums as public tools, integrated to the cities; and the difficulty in promoting accessibility in all its forms. On the other hand, it was possible to see high approval of these non-formal education spaces by the public.

## **Introduction**

Science museums as object of this research was a choice by the importance of these institutions in the education and training of scientific culture. In a world where information and knowledge are fundamental intellectual capital for the formation to critical and participative citizens, science museums provides opportunities for dialogue with society about history, importance and impact of science and technology.

When designed in dynamics and interactive formats, museums stimulated the widening interest of the population, in general, and children and adolescents, in particular, by the Science, Technology and Innovation (ST&I).

Understand how are the museums, their investments and the support they receive by their sponsored institutions are some of the objectives of this work; as well as how they were created, organized, maintained, besides their management and communication processes. Although the educational and recreational aspects have been addressed, do not constitute the central focus of this work.

Researchers such as Cavalcanti & Persechini (2011) punctuate the difficulties regarding the dissemination of science and argue that it needs to be demystified, as it is not something that can be understood only by a few enlightened, but something that is within reach of everyone. The MCTI 2010 research demonstrates that in Brazil Science and Technology are now matters of day-to-day lives of most Brazilians and that there is a genuine demand for more information related to the área.

Within the existing reality, it is important to emphasize that the Science museums can be places of stimulating creativity and knowledge, capable of being complementary to formal education. They enable dialogue between S,T&I and the society. They act (or should act ) as well as recreational and cultural areas in the city.

This article addresses the complexities of the museum activity on Science and Technology, and it desires contribute to support with the public policy development and regulation of the area.

### **Methodology**

The methodology used is the Multiple Case Study of a qualitative nature (YIN, 2005, p.20). This paper seeks to examine not only the *modus operandi* of selected museums, as well as look more deeply as its policy and administration management works, observing the forms of funding. Were used the following methodological procedures: literature review; documentary research, interviews, direct observation, field research. To the museums selection criterias were: 1) Recognized work in Scientific Divuligation; 2) Education sector; 3) Museums hands on; 4) Located in the State of São Paulo, in different cities; 5) Were knowed for the quality e by different administrative sponsored. All selected institutions are public e have recently been created (since 2007). They are: a) Sabina Escola Parque do Conhecimento (2007, municipal government of Santo André); b) Catavento Cultural e Educacional (2009, state government of São Paulo and managed by private sector); c) The Museu Exploratório de Ciências (2007, University of Campinas).

### **Results and conclusion**

When starting this work, by the methodology of multiple case studies (Yin, 2010), we expected find behavior patterns that could answer the questions " why" and "how " in anticipation of, among others, contribute to the strengthening of policies in the area of Scientific Dissemination. However, instead of behavior patterns, the found was a vast way of seeing, working and maintaining interactive museums of Science and Technology. By they we could reflet about the importance and impact at the *urbis*.

In a general way, the tree museums are interactives, recreational and playful equipament. Regardless of the quality or diversity of actions, science museums surveyed catch to the visitors attention and approval. On the other hand, have important management issues to deal with.

Interactive science museums are expensive projects to implementation and maintenance. Funding is a real difficulty. Currently, resources are derived almost entirely from public coffers of municipalities, through direct transfers, or by federal government, through public submissions. The research found is necessary an approach between the ministries of Education and Culture to the Science, Technology and Innovation Ministry (MCTI) for make a multisectoral politic to the area. Today, the main initiatives in Brazil comes from MCTI programs.

The lack of a public politics continued, targeted to the needs of a place that brings culture, education and leisure together contributes to the museums to remain dependents of public fundings and have their activities trapped. The world standard to financial organization included public funds, but also to remain private partnerships, donations and the souvenirs selling.

In despite of old and plastered Brazilians laws, it is posible stimulate and regulate other forms of action that facilitate the survival and autonomy of science museums. There are instruments that allow it, such as: the creation of Social Organizations (OSs), Sector Funds (like made at audiovisual sector) and associations of friends; offering management courses; stimulus grants, the merchandising and public- private partnerships etc.

It is necessary a change of culture in the country for the public-private partnership, as well as transparency in the management of public institutions in their own accountings to society. That way it is posible to resolve any doubts about the museums activities and to the raising funds been considered totally lawful.

### **Management and accountability**

None of museums and science centers surveyed have “accountability to society”. They do not produce monthly, quarterly or annual reports in accessible language and published, for example, in the very institution for public consultation website. Obviously, as public bodies, they are accountable to multiple instances of administrative linkage, which does not necessarily mean a dialogue with the community (which nominated this research as " accountability to society").

Of all the museums surveyed , the pinwheel is definitely the most transparent , mainly by virtue of its own form of contracting via Social Organization imposing the

quarterly accounts, annual report publicized in the Official Journal. But not only. It is also the publishing more detailed information on their website. Still could/should also provide their reports on the institution 's website.

### **Affordability, Access, *Urbis* and Citizenship**

There is a recognizable attempt of Sabina Escola Parque and Catavento in seeking accessibility to disabled people in their indoor facilities, but there is still much work to be done on accessibility for people with disabilities. The Museu Exploratório de Ciências, which does not have its own headquarters, no warranty physical accessibility in own facilities.

The three museums are not adapted or have their activities, physical or virtual, fully adjusted to the needs of mental, visual or hearing impaired people ( tactile floor , self-describing , among others ), disobeying federal law, of 2000, which establishes general standards and basic criteria to promoting acessibilidade.

Recently, the Catavento improved his disabled visitation plan, that works for previously scheduled exclusively on the first floor. The other museums do not have a specific policy for large groups . None of the museums websites maintains the worldwide accessibility instructions.

With regard to access, again, all museums have proved ineffective in ensuring the mobility of visitors (with or without disabilities). None have adequate mobility plan to promoting sustainable transport , such as urban public (bus or subway), bike/walk access. All are made to cars and rent travel/school bus.

The cities where they are located (Campinas , São Paulo and Santo André), there is little turistic information (both in format and in diversity), which can make life harder for those who want to get by car. There are an inadequate job of disseminating tourist. There could also be more information on access on the websites of institutions.

Regarding the dissemination of information on displacement to the general public and the media, the site of the Catavento is the only one that makes any reference to most types of mobility cited , albeit in very restricted way. Importantly, no in the MC-Unicamp site information on the movement of Unicamp own buses, which are taxfree, but have restricted times, and are no linked with the municipal buses. Use cultural and

entertainment facilities by public transport could be a priority within the strategy adopted mobility plan for cities.

The museums Catavento e Sabina are located in áreas with social problems. There was no social integration. Contrariwise, poor people and drug addicts are being evicted from the surrounding areas.

Transportation, security, accessibility, environment, among others, are fundamentals to the museums operations. Checking how the actions for the interactive science museums integrate are essentials to the managing process and build one city more friendly.

Inside the museums, a positive aspect is that the three museums have visual standardization and provide information on the premises. In this aspect , the Catavento can be considered a highlight , with extensive distribution maps and signs throughout the building.

### **Education and views on education**

The museums researched have different ways to understand and work education. In general, do not offer educational material support or do teacher training before the visits, as in other museums, despite the Catavento and Sabina are curriculum activities integrated of state and municipal secretariats, respectively.

Considering the fact receive funding of education, the results of this research demonstrate that the actions of educational support may be deemed insufficient. Regardless of how they wish to work the educational aspects, neither institution has explanatory material support to the public, in general, and teachers, in particular, with basic information about each exhibition unit. Nor is there research materials in language appropriate for children and youth. Ie, provision of text and/or multimedia resources that can be accessed by students in the post-visit, contributing to the integration between knowledge and learning.

There is a need for more effective action of these institutions in teacher training , beyond to the training of graduate students (monitors). Even Sabina, the more engaged in this sense, has gaps, especially considering the profile of action adopted by the municipality.

The museums also showed the absence of nuclei for development of research and lack of harmony for joint action with the production centers of existing knowledge, except those relating to monitoring, includes the MC-Unicamp, located inside an university.

### **Management and Society**

It possible to afirm based in the researched, in despide o the sucessful of their action, can improve their performance. The MC - Unicamp, for example, can diversify and expand the implementation of new projects, while Sabina economy could evolve on display . For example, if worked more effectively in mobilizing visitors, could improve the cost-benefit ratio, considering that the built space , with its multiple activities is underutilized. The Catavento has the higher rates of visitation, when compared to the others, but could act more efficiently, increasing their shares of attention to education and research.

It is clear the importance of institutions count on regular annual budget for its activities as well as planning seasonal lawsuits based vacations, holidays, anniversaries etc. They need to improve specific resources impacts in planning future in the medium and long term. It was found that more important than the administrative link is the form of work organization and autonomy of the institutions. At this point, Sabina has a big problem, because it is not considered "museum" to the municipality. The account court (TCU-SP) had not aproved by four year the museum as a educational equipment. So, its brings conception and divulgation misunderstandings.

The museums need act more forcefully in museum policy, both individually and via national and international associations. Independent of the attachment of the institution could: have operating policies better designed; agile and defined funding; improve their planning and management modes; seek greater transparency in their actions; integrate municipal urban plans of action ; and readjust and improve their educational plans based on citizenship, and pro- scientific culture. By doing so, they can be able to act more effectively by exploiting its full potential.

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