

The role of the Science and Technology Museum in the development of Patras University cultural landscape

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Abstract

This paper describes a study case of the Science and Technology Museum (STM) of Patras University, Greece. It highlights its role in the development of the University's cultural landscape and in its extension. STM succeeded to influence it by offering high quality non-formal education services to society. It was socially endorsed by the university and society. The key lies in sustainability which STM achieved to easily manage change and has endorsed strong and cost effective rules for functioning. New channels for distribution of scientific culture were developed. They have changed how people consume scientific and technological culture and created strong university-community partnerships.

Introduction

Cultural landscapes are the result of consecutive reorganization of the land to better adapt its use and structure to the changing demands of society. Cultural Landscapes change. Their changes are the result of three main driving forces that act simultaneously, accessibility, urbanization, and globalization (ANTROP 2003).

The Science and Technology Museum (STM) was founded in 2001, by Patras University in Greece, as a Laboratory of the School of Natural Sciences. This museum operates as a place of both study and recreation. It links the tangible and intangible heritage of sciences and technology of the university and the region and connects sciences to technology. As a university museum, it has to successfully serve the biggest range of audiences although it has crucially to do this with very much lower funding opportunities than other museums (KELLY 2001b).

To serve the community and fulfill its goals, the Museum is using actions that are commonly recognized by international conventions and specialized bodies such as ICOM. Building values, stimulating interest, fostering protection, providing tools for planning and management, and undertaking practical intervention are the key tools for the Museum's development. (RINALDI 2009) As there is no national policy framework for University Museums in Greece, the Museum had to find its own ways to be successful and allow further public/private sector involvement and knowledge management, in order to contribute to the development of the University's Cultural Landscape.

Since its opening to the public in 2009, the Science and Technology Museum has developed different means of dialogue and mediation to communicate with the university community and society. These means of dialogue include permanent and temporary exhibitions¹. At the same time, many other means are used to communicate with society as interactive exhibits, educational programs in exhibitions (Fig. 1), thematic networks, seminars and experiential meetings, informal and entertainment events, performing arts activities and concerts. This dialogue is supported and extended by volunteering and internship (THEOLOGI-GOUTI 2014).



Fig. 1

Educational Program 'I learn how
telephone works'

Photographer: anonymous museum
volunteer for the Science and
Technology Museum
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The Science and Technology Museum's exhibitions have been set up in a friendly object-oriented environment of non-formal education for different audiences. The permanent and the temporary exhibitions are based on Museum objects, interactive exhibits, demonstration experiments, reference to inventors and inventions, interdisciplinary and experiential approach, historical continuity, connecting science and technology. 'Telecommunications in our lives² is the theme and the title of the museum's permanent exhibition that has a dynamic character. The permanent exhibition is constantly enriched with new objects, information, and with educational interactive exhibits developed by university students³ (THEOLOGI-GOUTI 2014).

¹ The temporary exhibitions are organized together with important bodies of science, technology and culture as the French Institute, the Association of Patras artists, the Centers for natural sciences of the Secondary Education and others. They deal with environmental issues, energy, arts and technology, light and color, photography among others.

² The permanent exhibition presents the history of telecommunications, physics experiments as basis of telecommunications and records of different types of telecommunications as the telegraph, the telephone, the mobile, the radio, the television and the sound.

³ From the Department of Computer Engineering and Informatics and the Department of Architecture, during Internship in the Museum. They have developed an Interactive exhibit on the History of Telecommunications, a number of interactive exhibits on ancient greek telecommunications, an interactive exhibit on how telephone works, an interactive exhibit on the telegraph, two interactive exhibits on internet, an interactive exhibit on radio, and one interactive exhibit on television.

This paper highlights the role of the Science and Technology Museum in the development of the human dimension of the Patras University Cultural Landscape and in the extension of the Cultural Landscape beyond the University. Landscapes change as they are the expression of the dynamic interaction between natural and cultural forces in the environment due to the polarization between more intensive and more extensive use of land (ANTROP 2003). As a university museum, STM used those forces of Patras University to effectively disseminate knowledge, stimulate understanding, protect heritage, promote higher learning, and enhance the quality of life inside and outside Patras University (KELLY 2001b).

Impact

Museums are channels to the local community through integration into the community and through linkages outside of the institution, whose activities help the development of skills and provide social interaction (KELLY 2006). The Science and Technology Museum has been developed as a channel of Patras University to society. As a channel, it was able to influence and transform the cultural landscape of Patras University by offering high quality non-formal education services to different levels of society. The need to offer high quality services to visitors comes on one hand from their experience in the Museum, from the increasing importance of the educational role of the museum, and on the other, from the increasing pressure for the Museum to justify its existence. The Museum staff has made many efforts to know who its audience is, and how this audience can be extended, and develop exhibitions and other activities that will be popular and thus, will increase attendance (HEIN 1998).

The local community, mostly the educational community, started understanding and valuing the role of the Science and Technology Museum and the impact it has on the local community, in a reciprocal relationship of mutual benefit. The broader community also understands and has strong views about the museum's role, in providing information about issues that might be difficult and in giving access to science and technology (KELLY 2006).

The museum has succeeded in connecting the three levels of education. This connection has started to produce a number of benefits for the university such as attracting a number of high school students to choose to enroll at Patras University for their studies. The Museum also serves as a platform that connects different users: university and school students, school teachers, university professors and staff, people with special needs and other different publics (SIMON 2010). They all act as content creators, distributors, consumers, critics, and collaborators. Some examples are university staff and students who work or play with school children, or develop activities or experiments for children, children and teachers participating in activities specially organized by the museum for various levels of knowledge, as well as teachers and children who collaborate in setting up activities with the museum.

The Museum organizes and operates educational programs for school groups that include activities as treasure hunt games, performing arts activities, puzzles, interactive activities on computers, displays interactive experiments, and educational games. They have established innovative and successful ways to communicate scientific and technological culture. Alongside, the museum is educating school students in the use of museums. Apart from the regular programs on communication, telegraph, telephone, mobile, messages, sound, computer, internet safety; the museum has developed a special educational program for four to seven years old children, called *Discovering the House of 'Museum Kid'*⁴, which is based on the nature of a museum, and the activities that compose its operation.

⁴ The 'museum kid' is the Museum's mascot, a puppy, whose role is to explain to school groups how the Museum operates.

On the other hand, the museum helps its visitors to approach science & technology by using experimentation and participatory techniques, not just to give visitors a voice, but to develop experiences that are more valuable and compelling for everyone (SIMON 2010). It is for this reason, that STM has developed successful ways to attract and educate the public through events, (Fig. 2) such as seminars, concerts and other experiential activities organized for special publics. These activities are making science and technology easier to comprehend. A number of these activities are participatory projects⁵ that make relations among staff members, visitors, community participants and stakeholders more fluid and equitable. They open up new ways for diverse people to express themselves and engage with institutional practice (SIMON 2010). In this way, the museum amplifies the scientific and technological literacy of university students, school students, school teachers and the wider audience.



Fig. 2

**Event for the General Public 'I
protect the forest'**

Photographer: anonymous museum
volunteer for the Science and
Technology Museum
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Every year the Science and Technology Museum is involved in developing human participatory networks. They create important value for the museum and participants as well as poles of attraction for the non-participating audience members and provide a meeting ground between the scientific community and society (DURANT 1996). Human networks have been developed with university professors, and students and various students' scientific associations from different fields. An informal network has also been developed with the other Patras University museums⁶, in order to organize joint exhibitions and activities on environmental issues, on one hand and to explore possibilities for a common structure for the future, on the other. In this way, it is clear that the museum contributes to the monitoring of environmental indicators, which is becoming critical given the increased emphasis in the world today on climate change (KELLY 2006).

Very strong human networks have also been set up with bodies of science, education and culture diffusion, such as the Departments of Innovative Education of Primary and Secondary Education⁷ (KOUFOU 2014), Education Consultants of Primary and Secondary Education, the Centre for Natural Sciences of Secondary Education, the French Institute, Chorales, the Association of Patras Artists, Music and Art Groups and Performing Arts Groups, and the European Researchers Night. The museum collaborates with them and involves them in the channels for scientific culture distribution.

Therefore, these actions are aimed to foster informal and institutional networking thereby enhancing knowledge sharing. They have eventually tackled the issue of the cultural isolation of the University and, again, strengthen the general understanding and appreciation of science and technology (RINALDI 2009).

⁵ A good example is the event 'The generations meet at the Science and Technology Museum: Memory enables creativity', that was organized for the International Museum Day 2013 "Memory + Creativity= Social change". Children of primary school with teachers and parents met with retired technicians of the Greek Telecommunication Company, interacted and children designed the telephone of the future.

⁶ The other officially founded museums of Patras University are the Zoological Museum and the Botanical Museum.

⁷ Departments of Culture, Departments of Health Education, Departments of Environmental Education.

Challenges and opportunities

The Science and Technology Museum opened to the public in 2009, just about when the financial crisis was starting to affect Greece. However, it was socially endorsed by the university and society although the museum has encountered difficulties to be incorporated by the Central University and Departments. The key to the success lies in sustainability, not to mention that potential landscapes should enhance sustainability, which also needs to be understood in the context of the irreversible processes of urbanization and globalization (ANTROP 2003).

At the mid-1980's, museum directors have understood that the key to their success lies in how well they manage change within their organizations (KNELL 2003). The Science and Technology Museum achieved to easily manage change (technological, social, crisis...) and has endorsed strong and cost effective rules for functioning. New channels for distribution of scientific culture were developed. Those channels have changed how people consume scientific and technological culture and created strong university-community partnerships.

Museums have opportunities to influence, challenge and sometimes change how visitors think, inspiring them to take action on big issues and be more informed citizens in an increasingly globalized world (KELLY 2006). Since its establishment, the Science and Technology Museum has faced a number of challenges. The biggest challenge was to open the University to society and involve society in the museum. The University is situated in the suburbs of Patras and there has always been a minor connection with the city. Connecting the three levels of education was a big challenge as well. Other challenges were popularizing science and technology, by making them easy to understand, diffusing the scientific and technological knowledge, mostly the knowledge produced in Patras University, cultivating society in using museums and educating students and society. After the opening, the Museum had to deal with the economic crisis. It started in 2008, just before the museum's opening. It is obvious the museum has been asked to invent various ways to be successful with very few means.

In parallel, since its opening, the Museum has encountered a number of opportunities. A number of collections existed already in various laboratories and different departments⁸. The biggest and most important collections were the collection of equipment of telecommunications of the Department of Electrical Engineering and Computer Technology, and the collections of physics scientific instruments that became the basis of the Science and Technology Museum's permanent exhibition.

A new Building was specially designed for the Science and Technology Museum and a part of it⁹ was built (THEOLOGI-GOUTI 2000). There has always been a few Professors and Emeritus Professors willing to transmit their knowledge, and expertise on their discipline¹⁰. Many professors have supported the research for setting up the Museum's permanent exhibition. Others support the documentation of collections, participate in setting up the strategy of the Museum, and the strategies for dealing with the public. Several professors participate in events, seminars, workshops, by giving popular lectures to different publics. Finally, there has always been many volunteers, students, and young people, ready to help any time the museum needed them.

Facing Problems and Difficulties

The Science and Technology Museum has also faced a number of difficulties and problems since the beginning. The organization of the museum started from point zero. At the beginning, there was no building, no office, no chair, no table, no computer, not even owned collections. Alongside, the lack of money and the lack of personnel, and mostly specialized personnel were needed. A sense of isolation and loneliness surrounded the Museum (STANBURY 2000).

Bureaucracy was a real problem. The Museum needed flexible ways of functioning in order to blossom. Instead, it faced many problems to be able to function. It was not easy for the University's administration to accept the Museum. For the University, it is not still clear that the Museum cannot operate as an administrative department nor rely on bureaucracy as it has different goals, and a different work plan.

⁸ Mostly in the oldest Departments of the University as Physics, Electrical Engineering and Computer Technology, Computer and Informatics Engineering, Mechanical Engineering and Aeronautics, Chemistry, Civil Engineering, Geology.

⁹ 25% of the designed building has been built.

¹⁰ Mostly professors from the Departments of Physics, Electrical Engineering and Computer Technology, Computer and Informatics Engineering, Education, Philosophy etc.

The Museum team had to keep relationships with the Rector's office, University Professors, Departments and the administration. Professors and University staff's mentality has been a real problem. Many professors (more at the beginning, very few now) believe that the University is a place only for research and teaching students. They didn't want to hear about academic heritage or scientific and technological heritage or popularization of science and technology. Some of them were annoyed by children and teens coming to the Museum. Through time this mentality has reduced significantly. Now the biggest part of the Patras University community, agrees on the necessity of the Museum of Science and Technology for the University and for society.

The last difficulty was the lack of 'Museum Culture' in the university community and society. It is obvious that difficulties and problems in setting up the museum were also challenges to be surmounted at the same time.

Changing the University's Cultural Landscape

Humans have always adapted their environment to better fit the changing needs of society and thus reshaped the landscape (ANTROP 2005). Through challenges, opportunities, difficulties and problems, the Museum of Science and Technology strives to redefine the new cultural landscape of Patras University and its role and position as a University Museum in relation to the university community and society. Many efforts have been made to undertake the task of setting science and its history in motion and in the service of society (ARNOLD 1996). The Science and Technology Museum's exhibitions have been set up in a friendly, object-oriented environment. Collections exhibited in the permanent exhibition or in temporary exhibitions are the first facility that visitors enjoy, as direct contact with collections is one of the special things that the museum can offer (CLARKE 2002). As most genuine museums of science, STM has combined the adoption of a certain number of hands-on exhibits with the quest for new ways of interpreting the historical collections (DURANT 1996). To be educative, experiences are not only hands-on but also minds-on, and engage visitors in mental interaction (Fig. 3). They are organized to be educative not only sufficient by lively, vivid, and interesting (HEIN 1998).



Fig. 3

School Students experimenting
Physics within an Educational

Program

Photographer: anonymous museum
volunteer for the Science and
Technology Museum

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Patras University

Has the Science and Technology Museum succeeded to develop and extend Patras University's cultural landscape? The answer is yes; many achievements have been made in this direction. The Science and Technology Museum is fulfilling its civic responsibility to help produce well informed citizens as well as specialist scholars. Since the beginning of its operation it has played the real role of a university museum and has been distinguished by the wide range of audiences it was able to attract (KELLY 2001a). It doesn't offer visitors the satisfaction to simply gaze at worthy displays of exhibits in glass cases. Visitors are actively involved with the exhibits, to learn informally and to be entertained simultaneously. The museum is looking at ways to constantly improve access to its exhibitions so they can be enjoyed by more people. It uses many ways of doing this as for example new technologies, live interpretation, interactive experiments, arts and performing arts. They are all valid ways of trying to demystify the museum as well as science and technology, and help visitors make more sense of the collections (CAULTON 1998).

Thus, the Science and Technology Museum was also able to bring an important number of visitors, mostly children, adults, and students to the museum and consequently to the University¹¹. Direct contact with collections is one of the special things it can offer. Children, teens, students, and any type of visitors participating in the museum activities, all seem to have been affected by the opportunity to work with the “real thing”. Many were inspired by the objects—both immediately on site where the opportunity to interact with the objects was much valued, but also for children and teens back to classroom, where the impact of using the objects could provide inspiration for a term’s work (CLARKE 2002).

The museum was also able to focus the society’s interest in science and technology and in the University and open the University to society. Through engaging with museum collections, children, teens, students, the public can develop their understanding in specific and grounded ways and preconceptions can be challenged (CLARKE 2002). Clearly, in considering learning in the free-choice environment of museums, the interest and beliefs of the learners are fundamental (FALK 1992). It is understood that learning requires active perception, attention and encoding, and STM tries to develop processes that can be appreciated by the biggest possible number of people.

Therefore, strong relations with society have been developed, the three levels of education have been connected, (Fig. 4) scientific and technological Literacy has increased, and the quality of cultural services of the University of Patras have been enriched. All the above actions have reinforced the message that Patras University is a place of culture and learning, and have extended the University’s cultural landscape (KELLY 2001a).



Fig. 4

University students interacting
with school students within the
Educational program ‘Adventures
in the SpiderInternet City’
Photographer: anonymous museum
volunteer for the Science and
Technology Museum
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Patras University

Conclusion

Using different means of dialogue and mediation the Science and Technology Museum communicates and interacts with the university community and society. STM was firstly connected to the local society. It gave access to the University, to science and technology and promoted a different. Connections with school groups and student groups from neighboring areas followed. Providing understanding of science helped the Museum succeed in amplifying and transforming Patras University.

Now, the Museum’s connection with society is extended to most parts of Greece. There are visitors from different parts of Greece as well as a number of foreign visitors. The connection with society was increased by a nationwide photography contest ‘Tele-communicate’ that has been launched in the beginning of 2016 for the International Museum Day ‘Museums and Cultural Landscapes’ covering three categories: children, teens, and adults. A number of school and university students, school teachers and others have worked from winter to spring this year in order to participate in the contest.

The contest gave the museum great results. On one hand the contest amplified the Science and Technology Museum’s visibility, as well as Patras University cultural landscape. On the other, the museum was able to collect a very good photographic archive on telecommunications today and the past for the future.

¹¹ When the museum opened in 2009 the number of visitors was 10.000. In 2015 the museum had 42000 visitors.

The continuation of developing Patras University cultural landscape process will be very long and on-going. Many efforts to increase the connection with society should continue to be made, year by year and new activities to attract the public should be invented to keep society interested. Interaction with society needs to be constant, as well as society's needs should be updated every time. Finally, to accomplish the goals to amplify the University's cultural landscape, Patras University should finish the Science and Technology Museum building and provide the Science and Technology Museum with the necessary specialized staff and resources.

New landscapes emerge with changing life-styles, but ways involving the preservation of valuable elements and areas can become embedded functionally (ANTROP 2006). The transformation of Patras University landscape attracted the society's regard and turned it on the University, on the Museum, and on science and technology. It brought a different life style to the University and society. Through a global, integrated approach in which nature meets culture, past meets present, tangible heritage meets the intangible, science and technology meet arts and culture, the protection of scientific and technological cultural heritage, as an expression of living culture, contributes to the development of society, and the university's landscape (RINALDI 2009).

Thus, the STM, having embedded values of Patras University, as well as values of science and technology, has always been able to educate society in using museums as an interesting and entertaining activity for their leisure time and demonstrated that museums are an integral part of social and cultural capital (KELLY 2006).

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