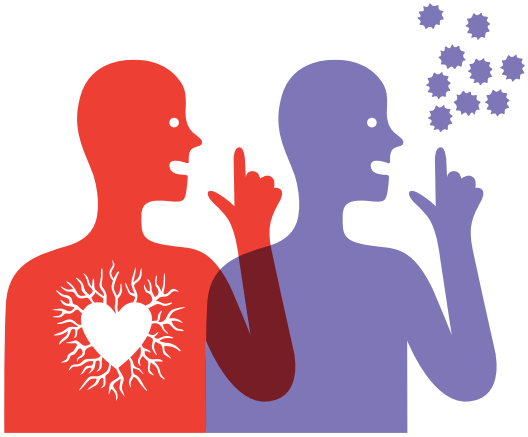

PILOTS

# *Pilots Resource Pack*

## Resources for the professional development of explainers in science centres and museums

Edited by Camilla Rossi-Linnemann and Michael Creek / **JUNE 2010**



Education and Culture DG
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EACEA
Education, Audiovisual & Culture Executive Agency

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# Foreword

Who are explainers, and how is their role evolving? There are different names for the people working in a science centre or museum who come into face-to-face contact with the public – animators, mediators, facilitators and pilots, among others. Between 2008 and 2010, the Pilots project, coordinated by Ecsite, worked towards the professionalisation of the role of explainers in science centres and museums through developing European training courses and materials, through community-building and through research on the role of explainers, with a focus on adult learning. Science centres and museums are changing. As a result, the role of the explainer is changing too. The Pilots project deepened our understanding of this new profile across Europe, and raised awareness of the importance of the explainer across the European network of science centres and museums. The project built on work carried out in the previous FP6 European project Dotik and the Ecsite thematic group for human interface and explainers, THE Group, with a particular focus on their importance for lifelong learning.

The work of Pilots focused around five key areas:

1 - AWARENESS

With its results and findings, Pilots worked to raise awareness of the explainer's profile among science centres and museums and beyond our field, to reflect on this and collectively make groundwork towards a European definition of this profile and the relevant training needs for adult engagement in science.

2 - RESEARCH

The Pilots project research began by collecting scientific literature, good practices, and results of other projects about the professional profile of explainers. The quantitative and qualitative data produced within the project gave a unique insight into explainers and training practices in Europe.

3 - TRAINING

The Pilots training courses enhanced adults' engagement with science in science centres and museums, through the training of the explainers involved in the project, and in the long term, through dissemination to the Ecsite members, as well as other stakeholders. The four training courses organised within the project lifespan were at once a way to test training methodologies and a way to disseminate best practice, at local and European level. The multiplying Co-Pilots events allowed this best practice to spread throughout institutions.

4 - MATERIALS

The training materials developed within the project, a selection of which are contained in this document, were compiled to form a resource centre, available to explainers all over Europe.

5 - COMMUNITY

Lastly, a true community was established and is being developed, of individuals interested in the role of the explainer in science centres and museums, sustained on the Pilots Hub, http://pilots-hub.ning.com, our lively web platform that operates as a European community resource for explainers.

The pedagogical materials contained within this document were developed by science communication experts from the various European science centres and museums involved in Pilots, and have been thoroughly tested and reviewed throughout four international training courses and subsequent follow-up activities. Of course, these materials are just a part of the project results – I therefore invite you to join us on the Pilots Hub to learn more about the profile of explainers, to discuss the results and to share your own experiences.

**Catherine Franche, Executive Director**
Ecsite, the European Network of Science Centres and Museums

# Introduction by the editor

CAMILLA ROSSI-LINNEMANN
(NATIONAL MUSEUM OF SCIENCE AND TECHNOLOGY LEONARDO DA VINCI – MILAN, ITALY)

Explainers in science centres and museums are highly qualified professionals who constantly work to adapt to the current needs of new generations of visitors. Research conducted as part of the Pilots project shows that explainers are flexible communicators, who know how to listen to their various audiences and mediate between them and the world of science. In order to do this effectively explainers need to continually develop their skills by searching for new ways to communicate both basic scientific principles and the latest findings and perspectives of science research.

We believe that the best way to increase one's knowledge and abilities is to reflect on field-practice together with others. The activities propose new practical ideas, guided conversation and prompts for reflection that allow explainers to explore – together with their colleagues – issues that are pertinent to their professional development and practice. Activities and materials have been tested in four Pilots international training courses by explainers from over 25 counties, representing over 50 different institutions.

The resources are aimed at professional explainers and they are therefore intended mostly as practical activities that serve as "tools for thought". Rather than giving theoretical frameworks, they want to stimulate independent thinking and prepare for further personal, free learning. Activities are thus based on the idea of reflective practice, where participants are invited to experience some practical activities and use them to reflect on their own professional practice. All activities involve the sharing of personal reflections among participants and materials are thought of as triggers for thought and conversation.

These resources were written to support both expert and new explainers in their training, focusing on four areas of interest:

- The first cluster of activities is dedicated to reflections on the role of the explainer and it includes activities that help reflect on the specific skills and abilities that all explainers should have.
- The second cluster focuses on the idea of enquiry-based learning and on how to develop activities for visitors that take into consideration their pre-knowledge, interests and thinking patterns.
- The third cluster is dedicated to the development and conduction of debate activities which may be particularly interesting for those who want to involve adult visitors in controversial issues of current science.
- The last activity is dedicated to science shows as a means to engage visitors by creating emotionally charged experiences and environments.
- Resources include detailed descriptions on how to conduct the activities, printable handouts, supporting power point presentations and useful readings.

**TIPS ON HOW TO USE THE RESOURCES**

- Select and tailor these resources to suit the time and content needs of your institution. Finding the time for carrying out training sessions is – in fact – both essential and difficult. It is thus not necessary to carry out all the activities included in one cluster. Feel free to pick and choose!
- Think about how the activities you choose fit the needs of your institution. What do your colleagues already know? Can you create an introduction and conclusion that frame the workshops within their everyday practice? Be creative!
- Make sure you are confident with leading the activity and that you know what you want to come away with before you start. You might want to run through it first with your co-leader or another colleague.
- Make sure you have all the materials and handouts ready. You might want to translate them in your local language to make them more accessible to your colleagues.
- Lead the activity in a relaxed and informal way. Give people enough time to carry out the activities and keep them engaged and motivated by encouraging input from everyone. Remember you are there as a facilitator, to help your colleagues reflect on their practice.
- Think about how you are going to capture the reflections that emerge from the workshop. You can use flip charts, coloured post-its, photos and personal notes that you may want integrate in your conclusions. If you can devise an effective monitoring system it is useful to give feedback by sending participants a brief report of the workshop with findings and photographs.
- Spend a little time after the workshop to discuss the experience with your co-leader and colleagues. Self evaluation is precious: how did you feel the workshop went? What would you do differently the next time?
- Please note that activity descriptions refer to supporting materials and power point presentations that can be downloaded separately.

**To share your results with Europe's community of explainers, and keep in touch with other explainers and trainers around the world, sign up on the Pilots Hub:**

**http://pilots-hub.ning.com**

# 4. Science Shows

LUKA VIDIC
(USTANOVA HIŠA EKSPERIMENTOV – LJUBLJANA, SLOVENIA)

Here is the pedagogical material for the workshop on how to create and present a successful science show. Before you start reading the pedagogical material, we would like to briefly immerse you into the world of science shows.

What is a science show? One could briefly describe it as an interaction between the performer/s (usually one or two) and the audience, enriched with experiments. Yet this description does very little justice to the wide variety of forms in which science shows might be presented. Let's expand it!

A science show is not as formal as a lecture. It involves more interaction between the performer and the audience than a standard demonstration. It evolves and adapts to the audience itself. Science shows often include elements of theatre, stand-up comedy, storytelling, circus and much more – all used to create a relaxed atmosphere.
Science shows use what the audience already knows, and take this to a new level of experience and knowledge.

Promoting science is usually the secondary goal of a science show. The foremost objective is to promote learning and understanding through enquiry and questioning.

Science shows have a storyline. They can be based on a theme – for example science shows on electricity or on geology. Or they can be kept together by a context, or story, which links seemingly unconnected experiments.

Science shows can be developed for a specific audience or they can be adapted to different kinds of target groups. In the latter case the experiments and their arrangement remain the same, while it is up to the performers to present the experiments and to adapt the knowledge level to their public.

Science shows are "living" entities with their own evolution. Performers can try different approaches to present the selected aspects of an experiment to a variety of different audiences. For this reason, a written script of a science show with "performing" suggestions is always welcome.

Sometimes an experiment itself or the way it is presented will not work as desired. When this happens it will be changed or substituted by a different one. For this purpose, performers should always have some "parachute" experiments up their sleeves to use in case of need.
"Be prepared for more and show just the right amount" is a good approach for presenting science shows.

We would like to point out the importance of the science show performer! Imagine yourself going sightseeing with a tour guide. A good guide will not mention only dates and give you an evil eye when you ask a question (although it is good to listen to a "word-by-word rehearsed" guide once in a lifetime – so you can appreciate the good ones more). A good guide will connect the sights with a narrative line and plunge you into it: stories and anecdotes make the experience taste much better. We can say something similar of a good science show performer. A good performer is always keen to learn more and should enjoy not only communicating with people, but encouraging them to actively participate in the science show.

Remember, no matter how much good advice you may get from fellow performers and from literature, nothing beats practice!

# Some thoughts on theatre in science museums

MASSIMO ABBAMONTE
(NATIONAL MUSEUM OF SCIENCE AND TECHNOLOGY LEONARDO DA VINCI – MILAN, ITALY)

Museums and science museums often host shows and theatre performances. But why should theatre take place in such institutions? What makes museums – and more specifically science centres and science museums – suitable locations for this form of artistic expression?
Among the goals of contemporary science museums are to inspire a connection between collections and visitors, to encourage discussion, to create an informal atmosphere during visits, to enhance an active acquisition of knowledge. In this perspective "theatrical media" can be considered extremely useful tools to engage the public in museums.
Theatre is above all a form of art able to communicate effectively with the public being multifaceted and multidisciplinary. It is based on bilateral communication between the performers and an audience that receives messages through an emotional connection with the story and characters of the performance itself.

Science and technology are not easy subjects to present to the public, but they strongly relate to our daily lives, have a great impact on how we think and behave and often have also an ethical dimension. Theatre describes life in a focused and emphasised way. So science can be part of what theatre investigates and questions.

One of the main advantages of theatre focusing on science in museums and science centres is that the possibility to talk during a performance about scientific issues even if they are controversial, without necessarily having to be neutral. Performers can show absurd situations, stage "politically incorrect" settings or present explicit points of view. In this case, the audience is aware that artistic performances do not have the aim to transmit science contents, but rather that they are situations which help us plunge in an emotional state that encourages questioning on specific topics.

In this perspective the point is not having the public agreeing or not with the views proposed in the narrative; the focus of the narrative stays with making people think about a given topic. Theatre does not give answers, it stimulates personal and conscious reflections.

Moreover, when we participate in a theatre performance we participate in a "playing" process. Children relate to the world around them through play. This can also be true for adults, who can use play to create links with scientific and technological issues of contemporary life. Theatre can and should be an intense and lively means of communication, able to speak to a wide range of people.

Different styles can be adopted to communicate a given topic: from sparkling and humoristic to serious and dramatic. There are therefore different types of performances: interactive narratives in first person, historical representations and role plays, classical drama performances, science shows, etc. Yet these definitions should not prevent contamination between different genres and techniques that can – and should – emerge and merge in museum theatrical performances.

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**Suggested reading**

- Chris Ford, Museum-Theatre, Museum Practice, Issue 13 (volume 5, Number 1) 2000, pp. 62-64
- Jonathan Milton. Laughing matter, Museum Journal October 2006, p. 23
- Catherine Hughes, Museum Theatre: Communicating with visitors through drama, Heineman, Porthsmouth, 1998
- Peter Brook, The Empty Space, 1968

## SCIENCE SHOWS

## TIPS AND TRICKS TO CONDUCT A GOOD SCIENCE SHOW.

**AUTHOR**
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Luka Vidic (Hisa Eksperimentov – Ljubljana, Slovenia)

**AIMS**
This workshop aims to enhance the confidence of explainers in performing an entertaining and instructive science show for adults.

The workshop shows the development of an explainer in giving a successful science show. Within every phase of this process, tips and tricks will be provided to master this 'art'.

What is a successful science show? The answer to this question depends both on the culture of the audience and on the performer. What works in one country will not necessarily work in another. Something that is entertaining when done by one explainer, could be a bummer when done by someone else.

This workshop will only facilitate the growth of an explainer towards the art of performing a good science show. There are no golden rules nor an absolute key to success. Much depends on the creativity and personality of the performer.

This aside, there are a couple of basic techniques that work. They are presented in this workshop. Communicating science to adults isn't always easy, moreover using science shows as a medium isn't always an obvious choice. Although a show is often linked with explaining science to children, it can also be very useful to use for adults.

**YOU CAN USE THIS WORKSHOP TO**
- Get tips on how to conduct science shows and other similar activities.
- Reflect on the general skills needed to perform in front of an audience.
- Show that one problem can be solved successfully in many different ways.

**TAKE HOME IDEAS**

Science shows are not only for children.

Science shows depend on cultures and rely strongly on the performer.

Demonstrating scientific principles will ensure deeper learning.

An experiment can fail. It's the reaction of the explainer that never fails.

**SCIENCE SHOWS - BEFORE YOU START**

Timing
1.5 or 2 hours + one short assignment given to two or more participants (preferably 2 weeks before the workshop)

Workshop facilitators
This workshop can be conducted by one workshop facilitator, although it is useful to have a co-facilitator who can assist and interact.

Number of participants
From 10 to 25.

Space organisation
During the workshop there is no need for tables. It's actually best to remove them from the workspace. This ensures a rapid reorganization of chairs.
The actual workshop starts with a presentation. Therefore the chairs need to face a projection screen.
There is no need to take notes. Handouts of the presentation can be printed as a reminder.
For the second part of the workshop, the group is split in smaller groups of 3 to 4 participants.
Groups are spread out through the room, not to disturb each other.

Materials
- Flip charts (one for each group)
- Markers (one for each group)
- Projector with computer and screen (optional but recommended)

Available for download:
- Workshop leading presentation: PPT4.1

The workshop at a glance
Pre-assignment given to two or more participants (preferably 2 weeks before the workshop)

| | |
|---|---|
| 5 min | Greet participants, introduce yourself and explain why you are doing this training |
| 25 min | PPT presentation |
| 30 min | Tips and Tricks (optional) |
| 15 min | Discussion in small subgroups (question 1) |
| 15 min | Discussion in small subgroups (question 2) |
| 30 min | Presentation by every subgroup and conclusions by workshop facilitator |

**SCIENCE SHOWS - THE WORKSHOP STEP BY STEP**

Pre-assignment given to participants (preferably 2 weeks before the workshop)

Time: 10 min
Setting: You can ask participants to fulfil the assignment wherever they want and send you their materials.

What to do:
- Ask two or more participants to note down on a piece of paper the problems they normally encounter when performing a science show. This ensures that the workshop is specifically tuned to the needs of the participants rather than being a general and abstract presentation.
- Turn those problems into "how to… ?" questions. Some examples:
  how to invite adults as volunteers on your stage? How to act when an experiment goes wrong?
- Reduce these to approximately 10 questions by combining related themes and ideas into one question.
  Make sure that none of the problems is left out.
- Include these 10 questions in the last slide of PPT4.1 as an initial input and warm up for discussion.

PPT presentation

Time: 25 min
Setting: As above.

What to do:
- Use PPT4.1 to start the workshop and to present and discuss the steps which are needed to perform a successful science show. Also do's and don'ts are discussed.

**Note on the presentation**

Try to familiarise yourself with the presentation and adapt it to your own performing style.
It is important to speak from personal experience.
Every part of the presentation can be illustrated with a scientific experiment to show and strengthen the content of each statement. This can make the presentation looser, more fun and more relevant to what is done in your institution.

Tips and Tricks (optional)

Time: 30 min
Setting: Participants sit in front facing the facilitator/s

What to do:
- After do's and don'ts we recommend a short presentation of tips and tricks.
  These can analyse specific situations or versions of science shows.
- Invite one experienced science show performer (or yourself) to perform a science show or a small piece of it. You can decide instead that you want to invite several science show performers (in this case, limit the time to 2 minutes per presenter). In any case, the performance should be based on a "show and tell your experience" structure, so that presenters can speak about their own suggestions on do's and don'ts from personal experience.

Discussion in small subgroups (question 1)

Time: 15 min
Setting: Participants split in small groups of 3 to 4

What to do:
- The last slide of the presentation is the one with the 10 questions from participants. These are the basis for discussion within the subgroups.
- Distribute flip charts and markers to groups.
- Ask each group to choose 2 questions from the final slide.
- Ask each group to discuss one of the two questions for 15 minutes and ask them to note down on the flip charts their suggested solutions based on personal experience or on what they have heard in the presentation.

Discussion in small subgroups (question 2)

Time: 15 min
Setting: As above.

What to do:
Repeat the above actions for the second question chosen by groups.

Presentation by every subgroup and conclusions by workshop facilitator

Time: 30 min
Setting: Participants can stay were they are and sit facing the facilitator

What to do:
- Ask each group to present its solutions for one of the questions. This can be done by the spokesperson of every group (of course this person can be assisted by the other group members).
- Encourage groups that have chosen the same questions to complete and participate in the presentations. In any case you should try to facilitate reactions by all participants.
- Ask someone from each group to note down all the integrative solutions that come up in the plenary discussion so that you can then create a report to give to participants after the end of the workshop.
- After all subgroups have presented their first question, proceed with another round of presentations for the second question.

**Notes**

# Contributions and acknowledgments

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Luka Vidic was born in Kranj in 1978. He graduated at the Faculty of Mathematics and Physics in 2002 and is a high school teacher of physics. He started to work in Hiša eksperimentov in 2000, first as an explainer and from 2001 also as a presenter of Science Adventures. He became an employee in 2004 as Activity Editor. Apart from constructing new exhibits, presenting Science Adventures and writing science popularisation articles his work also includes organisation of science competitions, workshops and public science popularisation lectures. He also takes part in local and international projects.

**Special Thanks**
Pilots partners also wish to thank all the explainers from across Europe who took part in the international training courses for which these materials were first created. Their professional contribution was extremely precious and has helped to select and review these pedagogical materials, making them even more relevant to everyday practice of professionals in science centres and museums.
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