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Comment

Should explainers explain?

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One of the most common, and probably one of the crucial questions about science centers and interactive exhibitions is often phrased as "Ok, it's fun, but do they learn anything?". What follows is not an attempt to answer this question; we will just use it as a starting point for a discussion about the role of explainers in science centers.

Explainers are usually very motivated people, possessing a genuine interest in science and technology and a scientific background they are eager to share. And they feel everyone else should be as enthusiastic about science as they are. This is a legitimate aspiration, of course, but how exactly does one try to achieve this goal? What is the explainer's role?

Quite often, the answer to the question "…but do they learn anything?" is: "Yes, if we teach them". It is simple, straightforward, probably it works to some extent, and this is the reasoning that makes explainers become… well, explainers. And this should be avoided.

A delicate balance

What we think about the role of explainers is obviously determined by what we think the objective of a science centre is. And, when we talk about science centers, we are most probably thinking about interactive exhibitions. These are designed to promote an active behavior on the visitors or even, ideally, to induce some kind of "scientific behavior": observation, questioning, manipulation, experimentation, critical evaluation of statements and answers, these are all desirable behaviors that a good interactive exhibition should induce in the visitors.

Considering this, it is clear that "explaining" can ruin a good interactive exhibition, because all interaction disappears. With very rare exceptions, when one enters a room where someone is explaining exhibits, or conducting guided visits, or making demonstrations, what one sees is a group of visitors watching this person, their arms crossed, possibly nodding. Even if the group is asked to perform some activity or to manipulate an exhibit, only one bold soul will volunteer and what follows will most certainly be just a "hands-on" moment, not a "minds-on" activity: after pushing the buttons, the bold visitor will step back waiting for the explainer to do the reasoning.

This is not to say that guided visits or explaining objects are bad practices, or that they are ineffective: visitors may learn a lot from this kind of visits, and certainly there is a huge number of excellent such practices in museums and science centers everywhere. What we think, though, is that this mediated exploration of an exhibition is justified and works much better if it is done about objects or a collection of objects: a XIX century scientific instrument, a mineral sample, or a real astronaut suit that went to the moon can provide the focus of interest and emotional attraction necessary to make an explanation effective and, with such objects as showcases, the information will last for a long time in the visitor's mind. Interactive exhibitions, though, work in a different way. Their purpose is only fully achieved if a visitor directly interacts with the exhibits.

What we've said above is probably no news to anyone, but when faced with the truism that science centers are supposed to educate, or that visitors are supposed to learn in a science centre, most of us will no doubt switch automatically to "explaining mode" as the best bet that visitors will then eventually learn something. And they do learn, but at the cost of betraying the main assets and purpose of science centers and interactive exhibitions.

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What, then, is an explainer supposed to be doing in an interactive exhibition? Let's consider the following question: what is preferable, a visitor that is unable to understand an exhibit, but at least tried to understand it by himself, or the visitor that gets the explanation from an explainer? The answer is: neither. The first visitor should have clearly benefited from the intervention of an explainer, the second visitor had too much of an explainer.

It is a delicate balance, no doubt. There are no absolute guidelines to give to explainers so that they can fill their role adequately, but maybe the well known motto "always answer a question with another question" helps in the right direction.

The particular case of school groups

Is there a different situation when we consider school groups?

There are obvious reasons to think that a more active role should be expected from the explainer when considering students - after all, these are supposed to be really learning something from their visit, the visit is probably linked with certain curricular objectives, or is a complement to what they learn in school, and so on.

But, even more than with the average visitors, explainers should exercise extra care when dealing with school groups, for a number of reasons:

a) We are dealing with subjects that are part of the curriculum

Let's consider a museum with a specific collection of objects. Say, for instance, a car collection, or one about communication devices, or an art museum. As long as there is a definite set of objects, people working in that place very likely know more about the collection than the teachers visiting with their students. It is perfectly justified, even demanded, that explainers in such places have a very active role presenting the objects, exploring them, teaching visitors and students about objects they know best than anyone else.

But, when considering science centers, namely multidisciplinary ones, we are no longer talking about "objects", we are talking about "subjects". And they are the very subjects science teachers are teaching their students: physics, chemistry, biology, mathematics… Even considering temporary exhibitions about airplanes, or brain, or hair, the basic fact is that science centers are not envisaged as places about a specific collection or topic, they are about science and technology in general.

If explainers talk about water, or color, or waves, or fractals, or magnetism, or LCD's technology, they are meddling with subjects that are part of the school curricula. And, therefore, they are not the right people to be perceived by students as experts in these subjects. Explainers may help, but center stage should belong to the actual teacher(s) of the group.

b) Explainers do not have superpowers

No matter how good explainers are, how diverse their background, or how up-to-date the training they receive for each exhibition, there is no way they can be accurate, knowledgeable and reliable sources of information for every theme and exhibition staged in a science centre. One day it may be about health, the next about light, one exhibit about sound, the other about symmetry. Explainers know best than anyone how the exhibits work; but teachers know best what the exhibits may, or should, mean to their students. Also, teachers know what the background knowledge of their students is and may use it for a more profitable exploration of the exhibits.

c) There is a problem of time frame.

Ideally, learning should be a lifelong activity. But even in a more formal context, learning takes a long time, even just considering the basic levels of education.

Now, let us consider a school visiting a science centre. There is a first visit, there might be a second one, and after that either the students are very motivated or it becomes boring. An average visit takes 1.5

to 2 hours. Therefore, an average student in an average school might spend a total of 3 to 4 hours visiting a science centre, exploring a multitude of concepts and being exposed to a diverse set of ideas and themes.

What does one learn in 4 hours? Maybe a lot, if these 4 hours are preceded by some preparatory work. Maybe a lot, if these 4 hours are followed by follow-up activities.

Either way, an explainer has only some influence on the 4 hours spent in the science centre. The rest of the work belongs to the teacher.

d) There is a problem of legitimacy

When someone acts, even for a short while, as an "educator", there is always a problem of legitimacy. Who is and what entitles this person to be regarded by students as a reference, or as an "authority"? In other words, what or who is validating the information or educational actions of this person? In most of the cases, science centers do not have strict and public criteria for selecting their explainers, there is not a defined "curricula" or "body of knowledge" that can be envisaged as an educational plan, and there is no easy evaluation of educational practices in science centers. An explainer can either be the best science teacher or a charlatan, but no clear and written rules select for one or the other. We just trust people in charge of science centers to know who they enlist as explainers. But trust is not a very scientific criterion.

If one accepts all the above considerations, it becomes clear that, when it comes to school visits, explainers should interact with the teachers, not with the students. If a school books a visit with a definite purpose, like studying optics for instance, explainers should help the teacher prepare and carry out this visit. No doubt, a lot of support from the explainers is always needed to get all the group of students engaged in the activities, but the main role belongs to the teacher.

Let's assume for example, that the teacher thinks a guided visit is a good idea. In this case, the ideal situation is if the teacher is the one guiding the visit, using explainers as helpers. True, this is a very rare kind of visit. There is seldom time to prepare beforehand a good school visit together with the teacher, as this would require on the teachers' part a lot of time and effort discussing things with the explainers. On the other hand, it would be impossible to assist all the schools that visit a science centre in preparing such visits. But these visits should be very much encouraged and a lot can be done in terms of support materials and suggested activities.

Most probably, however, school visits will go on following the usual pattern: some visits are prepared by the teachers and require almost no intervention of the explainers, others will be the result of explainers working with teachers.

A big majority of visits, however, will not have a clear objective and no prior preparation. These are regarded as just a field trip to a science centre, period. Contrary to some opinions, however, this is not necessarily bad. When dealing with these groups, however, explainers should forget the youths belong to a school, and should act as if the group is made up of average visitors. They are no longer students of optics or waves or geometry or chemistry or music. They are visitors in an interactive exhibition: discovering, playing, questioning, experimenting, becomes the main purpose of the whole thing.

The "ideal" explainer

Science centers are definitely places for learning, not places for teaching. Explainers should not face themselves as teachers, or educators, but as someone that helps someone else to learn.

To behave accordingly is a major challenge. It is, in fact, much easier to deliver a prepared speech than to improvise on the spot reacting to a visitor's questions, misconceptions or doubts; it requires a deep scientific knowledge and confidence to challenge the visitor to put forward his or her own ideas and then build upon those ideas; it requires enough familiarity with science and technology to be able to "forget" about equations and standard formulations, and to be able to really talk science with the visitors instead of teaching it. This requires very good scientific and technological background, but most of the times

this is not enough: practical and specific training to develop scientific accurate improvisation and conversational abilities about science is essential.

An explainer should motivate, rather than explain, should question rather than answer, should challenge rather than present solutions; but we are not going to call these people "questioners" or "motivators" or "challengers". Then again, why not?

Author

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