LESSONS FROM LABORATORIO DELL'IMMAGINARIO SCIENTIFICO

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The experience of the last three years at Laboratorio dell'Immaginario Scientifico, Trieste, with educational projects and network technologies in a science center has brought me to identify four points which represent the shift from the science center as we know it today, to a new structure that will be less and less a science "center," but rather a knowledge lab, almost completely independent from a physical location with its exhibition areas.

The main focus of this article will be the learning experience, targeted to the school groups and in general the younger public (aged 7-18). it is not meant to exclude, however, an extension of this model to the general public and the entertainment aspects as well.

The experiences and projects I will refer to are collaborative projects done over the network. In short, we at LIS developed a series of educational activities on selected topics (air pollution, garbage recycling, drugs, energy), asking the students in several schools from all over Italy and now from all over Europe to work on these subjects, and to use the network to exchange materials, keep in touch, share resources and communicate.

Computer network technology has radically changed the learning experience that a science center can give. If we contrast the new experiences with the experiences of a conventional visit to the science center, the following aspects stand out:

- Broader and long-lasting learning experience;
- Direct and continuous contact with real sources of knowledge and research;
- Higher social experience; and
- Customization of the learning experience.

Broader and long-lasting learning experience

The communication network allows students to exchange ideas, comments, and data in real time, at any time. In addition, the network acts also as a database: it is always possible to easily refer to past messages and data. Every single scientific topic can be seen from different points of view. At the same time, in the school system, different curricula and classes can approach that subject using different tools and depth levels. The communication network makes it possible for small groups to concentrate on specific aspects of the subject, thus going deeply into the topic, without losing sight of the general phenomena, because they are always informed about what their mates are doing. In this way the scientific knowledge becomes a tool for teachers, who can "use" the resources of the electronic science center in a different way every time.

The division of work into small teams makes the experience valuable also from a broader point of view than merely the transmission of contents: coordination between the groups, ways to present data and research results, and communication protocols are important tools that our students learn.

It is important to remember that all this is a continuous process, and not a series of "events" in the scholastic life.

Direct and continuous contact with real sources of knowledge and research

Rather than giving content, we provide ways to reach the content: all of the activities that the students do refer to the original sources of information. Students organize themselves to go to research institutes, contact scientists, organizations and companies, to find out the data essential to their project. Enthusiasm is a strong motivation in these projects. The fact that students can choose their preferred field of activity, and that they can have daily contact with their mates from several different places, are very strong motivations to excel in their project. Likewise, the contact they have with the information sources is continuous; it is not limited to a school visit, but is a self-motivated discovery which in almost all cases is also extremely welcome from the sources' side.

Higher social experience

During these projects, which often last for half a school year, the students get to know each other much better than during traditional school activities. Working closely for several weeks, deciding how to organize the work, and sharing new and exciting experiences outside the school, provide an unparalleled social experience, which cannot be replaced by an occasional group visit to any institution.

Customization of the learning experience

This learning experience is customized for every single class, every teacher and almost every student (at least it is customized for the working teams). Customization is in terms of location (which in this way becomes irrelevant), content level (which can be interactively flexible), and dynamics (time, level of attention, and sub-topics to explore).

Following this model, the physical science center becomes almost unnecessary, since all the students' activities are coordinated and conducted over the network. The electronic science center becomes a sort of knowledge lab, a virtual place which promotes dissemination of scientific culture in a much more direct, flexible and complete way, and provides entertainment and social experiences as well.

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