

Science Centre

In the focus of the Schola Ludus philosophy is the concept of CHANGE. Following any process, the key to its understanding are the changes of a phenomenon during its development and the changes due to changing the outer conditions.

Also the Schola Ludus Project started under very special conditions of common euphoria in the former Czechoslovakia, in the atmosphere of general changes. The state system was changing and people hoped for changes in general.

Expecting basic changes of men's patterns of thinking and behaviour, our statement was: Poor proclamations or laws could not influence the "real changes" in people's minds.

To open the big themes such as "the state of the environment", "power stations", "health" etc. does not mean automatically to give people the democratic choice of relevant actions. The root of understanding the problems of Nature and Technology is in their principles and in understanding of the validity of the scientific evidence including consensus of scientists. The experience, knowledge and skills of gaining knowledge of science are - for people - as important as the knowledge of clear principles and the actual conditions which determine the development of particular phenomena.

And here was the point to be changed first, the views, content and methods of science education. Not only the VIEWS ON science that are roughly covered by Public Understanding of Science but also the VIEWS OF science. And this means also to substitute the present prevailing mechanical view of the world as the sum of phenomena, by a complex dynamic approach in the frame of which phenomena interweave each other and hence the description of the world is non-linear.

And because schools are systems with strict rules, large inertia and closed to the general public, the change of society was projecting into a new kind of non-formal science education that would become a significant complement to the existing closed school system. The Schola Ludus Project - aiming to build The Slovak Science Centre for All for lifelong education- started.

Right time, right place

But the urgent need to change science education was not only the Slovak case; the above-mentioned reasons are surely the consequences of the historical development of science in Europe and the commission of present era.

The Schola Ludus Project was initiated without any knowledge about science centres in the world. The goals were defined and the first call was turned to all University Departments in Slovakia to contribute.

Shortly afterwards, brief information appeared about 'Heureka' in Zurich, the gigantic temporary exhibition of the principal Swiss research institutions. We went there!

Enthusiasts from different Slovak universities filled a bus and on the way stopped in the Deutsches Museum in Munich and in Technorama in Winterthur. The discovery of coincidence of the project of our dreams and all that we saw was wonderful:

Let children, families and school classes play by ad hoc cases prepared in such a way that they should gain:

- their first experience with science;
- the feeling of basic scientific concepts;
- hints towards systematic science approaches.

Playing with simple experiments surrounded by appropriate tools, models and information materials in the Jugendlab in Technorama was just what was considered at that time.

2 Let people learn to appreciate the historical roots of scientific culture and the main points of science route - the examples of the best demonstrations were seen in Deutsches Museum, and the historical discoveries that changed the scientific conceptions in the "Babylon tower" of Heureka.

3 Let people learn real up-to-date knowledge of science dealing with the whole scale of science and technology problems, with men and social issues, from philosophy to economy - Heureka, Zurich was the excellent case.

The basic impression of the participants was - Schola Ludus is not a fantasy, it is possible.

Soon, there was the first meeting on Communicating Science in Amsterdam in 1991. And there it was wonderful to listen to personalities of science who supposed that involvement in public understanding of science was their responsibility, and besides this to try simple experiments of "Flying Circus" with university students; to meet Stephen Pizzey with his travelling exhibits; to follow science theatre "heavy discussions" between Einstein and Bohr about washing legs etc. and the lovely Pandemonia science performance without words giving the impression of the fragile balance of Nature; to take part in workshops where people are fully involved either in topics about how to build up a science centre, or how to create a scientific toy, and the results are strong, though different and even controversial. All these were just what Schola Ludus needed, and round the science centre and here were also found arguments and hints for action!

in the Mind

The Project and Foundation SCHOLA LUDUS originates from the Department of Non-formal Science Education at Comenius University, Bratislava, in Slovakia, the brainchild of Dr Katarína Teplanová. As she describes it: "SCHOLA LUDUS is developing as an action and research programme oriented to development of non-formal education open to the general public and its links to formal science education. Main tasks are development of methods for transformation of present science knowledge in understandable way for laymen and the transition of present teaching science in schools from purely idealistic constructions towards real world." The Schola Ludus project for a Slovak Science Centre for All was initiated in 1990. As yet no physical construction yet exists.

Working as a science centre

Then in Slovakia there were performed activities - travelling exhibitions, science shows etc. in museums, televisions, schools - with about 1.5 million visitors and participants, and people identify Schola Ludus as if it were a science centre. In fact, up-to-now there is only the small non-traditional university Department on Non-formal Science Education based on the Schola Ludus Project, and a small private foundation Nadácia Schola Ludus. While the Department is focused on research in the fields of cognitive sciences, communicating science and public understanding of science; and concretely on the development and testing of alternative conceptions for science education (up-to-now mainly in physics), courses for university students and teachers, the foundation provides most of the programmes addressed to the policy makers, the general public and school classes.

Any programme is supposed as an experimentation for all involved, e.g. also as Schola Ludus research laboratory and always also as a partial model of the science centre.

As main feedback, we look not for reflections related to the attractiveness of particular objects, but for correlations between visitors' preconceptions and misconceptions and their conceptual changes during and after the programme (exhibition, show etc.).

University students could choose from optional general courses like

Communicating Science, Science Show and Theatre, Physics by Experience, and, if possible, they took part also at out-of-university activities as animators, actors etc. Very appreciated are students' views, creativity and their first feedback on the newly-developed educational methods.

Formal, non-formal and informal

The Schola Ludus programmes link formal, non-formal and informal science education.

There is presumed to be a significant difference between non-formal and informal learning. 'Non-formal science education' is provided by non-formal methods but the learning environment (equipment, texts, evidence, documents etc.) is built in order to enable the participant to gain systematic knowledge and operational skill, or at least to stimulate him / her to gaining them. Hence non-formal science education, and particularly its methods, should become more and more a consistent part of formal education, while 'informal learning' is much more related to ad hoc information, attraction of people, and motivation.

One example of our alternative educational process is the parallel Schola Ludus method for learning, teaching and testing. The method was developed first for the exhibitions, and now is elaborated for schools in the form of tests with simple experiments including ICT-support. It was clearly recognisable

at the Schola Ludus exhibition SURPRISES IN LIQUIDS. In tests there is given an attractive 'key case' with a set consisting of several parallel cases with different goals to understand:

- 1 development of the occurring processes;
- 2 the particular conditions the process;
- 3 the basic universal science concepts;
- 4 the validity of the models of the process;
- 5 the usefulness of the treatment to gain new knowledge.

More or less than a science centre

Is it still necessary to build a physical science centre? For the Schola Ludus Project Group it would be perhaps quite comfortable to go on in the already established way. But is it really effective? The Project Group has the know-how but there is a lack of the development of appropriate materials and their dissemination. And there is no reference /authority institution responsible for bridging between science and society. Teachers, families and also the general public need a stable place with services that would be accessible at any time, a mirror of the present era and an eye into future... where generations, views, cultures meet, and people learn through pleasure. The Schola Ludus - School by Playing.

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