

Public Participation in a Dialogue on Science and Technology. Slovenian Strategies and Experiences

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A fruitful dialogue between researchers and developers of new products and technologies and different publics is essential. Firstly, the interest of researchers and developers to present the results of their work to general public is vital. Secondly, the representatives of general public have to possess certain degree of knowledge, scientific literacy and, they have to have the capability for communication. Nevertheless, the communication alone is not enough. The capability for communication is only the starting point. The dialogue must help to develop an understanding of the process of research and development work and of decision making.

People's attitudes about science and technology are the result of several factors. One of the most important factors is the media. Media's representations of the achievements of science and technology and events happening in the scientific community help general public to be well informed. In addition, it also helps to create a positive view of science and technology and to improve correct understanding of scientific discoveries and innovations.

Interest to possess knowledge on science and technology with an aim to become an equal partner in the dialogue, in addition to knowledge also requires proper understanding of science and technology. It is very important that people start to think about the function of science and technology, about creation of new knowledge, products and technologies and about decision-making processes in research and development.

The basic conditions for the improvements in public understanding of science and technology are developed long-term programme and action plan. The implementer and partners must be linked into the network, and the activities have to be directed in such way that they enable participation of all interested parties.

1. The “Problem” of Science and Technology in the Slovenian Society

1.1. The Brief History of Science in Slovenia in the 20th Century

The Slovenians entered the 20th Century armed with a poor research infrastructure. Only a handful of scientists worked under the framework of a small number of scientific associations. These scientific associations published their articles in periodical gazettes and as collections of scientific papers. Yet, in the 1st half of the 20th Century two of the most important institutions of science were established in Slovenia. The Slovenian University in Ljubljana was established in 1919 and the Academy of Science and Arts in 1938. The academy was later renamed in the Slovenian Academy of Sciences and Arts. The establishment of both institutions was a result of many years of efforts by Slovenian intellectuals to establish an institution to support their professional research work in Slovenian environment and to publish in Slovenian language. With the establishment of the University and Academy foundations to raise the organisational level of research work were created. Until the establishment the Slovenian university only private, amateurish and publicist functioning of science was prevailing in Slovenia. Direct research work was possible only in the outlying districts, especially in Vienna, Graz and Zagreb.

After the establishment of the Slovenian University in Ljubljana, the Slovenian researchers got the opportunity to come back to Slovenia and continue their research work. It also set up the possibility to include science in the life and work of the Slovenian nation. Hence, it is not surprising that until the beginning of the first four decades of 20th Century, the scientific disciplines that dealt mostly by the idea of nation - especially linguistics, arts and literal history, as well as general Slovenian history and geography - were developed the most. Until the Second World War some of the natural scientists established themselves in the international scientific community. In 1934 the Naturalistic Society of Slovenia, that popularised natural sciences among students and teachers and encouraged publishing of articles in the magazine Proteus (established in 1933), was established.

During the liberation and civil war, the studies on Slovenian national question were particularly encouraged. After the war, at the end of forties, the Slovenian economy and technology strongly depended on the Western countries and during the next decade many of young and younger researchers completed scientific training in the Western Europe

and USA. Following their return they established several research cores that later established themselves in the international community. At that time, the state founded several research institutes, particularly in the field of natural and engineering science. Even today, these institutes represent the framework of science organisation in Slovenia.

Very important events in the second half of the 20th Century represent the establishment of the second university, the University of Maribor, in 1975, and the beginning of the preparations to establish the third university in the South-eastern part of Slovenia. These preparations have started in the 90s of the 20th Century.

In addition to this short presentation, it is also necessary to know that until the last decade of the 20th Century, Slovenia did not have genuine need or opportunity to define the role of science and contemporary technologies in the national context. The Slovenians did not clarify the relations among peoples, nation and the state.

The endeavours from the third decade of 20th Century to plan the education of future researchers under the framework of Naturalistic Society of Slovenia were followed by new “Science to Youth Movement” in the middle of 60s. They were continued with state programme “2000 Young Researchers” in the middle of 80s. The Naturalistic Society of Slovenia and “Science to Youth Movement” were two of the most important popularisers and promoters of science in Slovenia. They are also the carriers of efforts to improve public understanding of science. With their continuity, they encouraged the development of strategies of introducing and including young people into science, especially on the local level (Kobal, 1987).

1.2. What do the Slovenian Scientists Think of the General Public

The Slovenian scientists are mostly devoted to their research work. Nevertheless, we must be aware that many of them are very critical and self-critical; therefore, they are able to judge the dynamics of the development of science in Slovenia. According to their opinion, the development of science in Slovenia was hindered in the 90s of the 20th Century. On the other hand, they also believe that these years were much more favourable for the development of science comparing to the 80s that were characterised by stagnation. Practically half of the scientist included into one of researches about research community in Slovenia in the 90s (Mali&Kozmus, 2002) believed that science in Slovenia can, on the

international level, compete with the most developed countries. Almost half of the scientists also believed that public administration does not provide suitable environment to encourage the transfer of new research achievements into the economy.

The Slovenian scientists are well aware of the importance of the international criteria when appraising their achievements. This is, of course, very good for the process of opening of the Slovenian science to the world. However, the scientists know that this process does not depend solely on them. They believe that some of the basic factors for the development of science in Slovenia are:

- publishing scientific research discoveries and achievements in foreign publications and reactions of the international community to these works,
- citations of Slovenian scientists in foreign publications,
- inclusion into the international research projects,
- co-operation and links with top level scientific centres in the world,
- information communication links with the world through the use of the Internet.

From the above we can conclude that the Slovenian scientists put a great emphasis on the internationalisation of their work, and that they are prepared to make some adjustments regarding the pace, productivity and the use of contemporary technologies. The meaning of the popularisation of research activity and the promotion of the awareness of the potential role that science can have on the development of Slovenian society are not listed among these factors. From this we can conclude that most of the Slovenian researchers are not aware about the importance of representing their research work to public, of discussions with the representatives of different publics and of the significance of dialogue between scientists and other publics.

1.3. What does the General Public in Slovenia Think of Science

General public's representations about the importance of science for the development of society and about more "visible" scientists greatly depend on media reports and media presentations. The events and people from the world of science usually appear in media when the activities presented are connected to the daily political life of Slovenia (e.g. the presence of eminent politician at the opening of new laboratory etc.). Through this, the media filters public understanding of an event. If this event is not associated with the politics, it does not raise an interest of

media and, consequently, it does not exist for the general public. This kind of “treatment” also influences the researchers and organisers of scientific events. If they are not able to get the attention of media (e.g. to record at least few minutes of the event), they do not “feel well”, and they start to believe that the scientific event is not very important.

To present science to the public, media in Slovenia created several special printed editions, radio broadcasts and TV series. This approach is good in principle; however, it can also turn away an average reader to have an interest to read a special edition in the newspaper/magazine or to listen to/watch the scientific series. Hence, the “ghettos for science” were established, especially in the printed media. Due to the editorial politics, the special editions often exclude the scientific events that are apolitical from the daily beat of society and country. Therefore, the representatives of general public do not have many opportunities to get acquainted with novelties and to form their own presentations and opinions regarding the events in the field of science. By this, they make it possible for too many researchers to be self-sufficient and live in “ivory towers” of closed scientific community.

1.4. Understanding and Misunderstanding of Science and Technology. The Role of Media.

People’s attitudes about science and technology are the result of several factors. One of the most important factors is the media. Media’s representations of the achievements of science and technology and events happening in the scientific community help general public to be well informed. In addition, they also help to create a positive view of science and technology and to improve correct understanding of scientific discoveries and innovations. At the same time the sensationalistic reporting about scientific discoveries causes negative attitudes about the importance of science and technology for the development of society. It can also lead to the ambivalent attitudes about science among the representatives of general public. This can be very problematic, since these attitudes can prevent adequate reactions to the contemporary challenges in the society, where the role of knowledge, science and development of knowledge-based society are emphasised.

Sensationalism is only one of the problems. There are at least two equally important problems:

- tensions between science and journalism, and
- changes in science and society (Turney, 2002)

The tensions are the results of misunderstandings regarding the functioning of researchers, process of research or development work and decision making. As long as the media, which has a very important role for maintenance and broadening of the dialogue, will not know what is happening in science and technology, we can not expect an improvement in dialogue between the general public and scientists. The compromises will have to be taken regarding the presentation of scientific achievements and portraits of prominent researchers in Slovenia. Research environment, actors and achievements will have to be presented as they are in reality, without any improvements.

The problems are also created by changes. On one hand, we are facing the crisis of trust in institution and its management of science for general purposes. On the other hand, stronger and closer co-operation between scientists from academia and business enterprises impedes the insight into what is exactly happening in science.

2. The Recent “Public Understanding of Science and Technology Movement” in Slovenia

2.1. Why does the Public Understanding of Science and Technology Matters?

The beginning of autonomous and independent country, the Republic of Slovenia, in 1991, demanded the establishment of suitable national programme for the improvement of public understanding of science and technology. The author of this article created this programme for the need of the Slovenian society in 1992-1993; and in 1994 the process begun to run on the regional and local level.

The reasons for creating such policy and programme in Slovenia was similar to those in other countries. Among reasons are the following: (a) enabling citizens to live in a modern world, (b) more democracy in science and (c) the enhancement of the democratic process through better informal public debate on the issues emerging in the field of science and technology.

What are the benefits of such programmes? Programmes are beneficial to science, national economies, national power and influence, individuals, democratic government and to society as a whole. They also have intellectual, aesthetic and moral benefits (Gregory&Miller, 1998).

2.2. Programme “Public Understanding of Science and Technology” in Slovenia

By the initial programme for the period of 1992-1993, which was the preceding programme to the current one, the Republic of Slovenia wanted to accomplish the following:

- better understanding and use of research and developmental work of Slovenian experts when dealing with different problems in society,
- successful satisfaction of the scientific and technological enthusiasm in people, especially in younger ones, by including them into research and innovation work,
- the establishment of permanent connections among young people, teachers, researchers and innovators (mentorship and collaborations),
- permanent collaborations between education and research organisations,
- discovering, developing and training of young for later professional career in the field of science and technology, and
- the rejuvenation and increasing of research and innovation core groups (Kobal, 1993, 1994).

At the end of the 1993, the programme was included into the National Research Programme for 1994, which was prepared by former Ministry of Science and Technology. After the founding of the Slovenian Science Foundation in May of 1994, this programme fell under the framework of foundation's activities. Two of the main objectives of the programme became improving public literacy and raising scientific culture. To achieve these objectives, the SSF has paid special attention to:

- the annual Slovenian Science Festival,
- the network of agents of experience acquisition and mastery of new knowledge (active in period 1995-1997).

By planning and carrying out the Slovenian Science Festival every year since 1994, the SSF further enables: (a) the presentation of scientific and technological achievements to various segments of the population, mainly through scientists communicating with various audiences, (b) popular science presentations of the achievements of scientific research work and technological development, and (c) the popularisation of science and technology, particularly among the youth.

Through the networks of agents of experience acquisition and mastery of new knowledge, the SSF encouraged the efforts of scientists and experts

to effectively acquire and master new knowledge on the basis of personal activity and specialised centres, linked into the network “Slovenian Science and Technology Park”. The most important acquisition of this network was the establishment of the first “hands-on science” centre in Slovenia, the House of Experiments in 1996 (Kobal, 1999).

During the second phase (in the period 1997-2001), the SSF has developed the co-operation with the media, targeting specific and general publics.

The results of the SSF’s efforts are presented in the Table 1.

Table 1: The efforts of the SSF to improve understanding of science and technology in Slovenia in the period 1994-2001

Year	Event
1994	The SSF organises the first Slovenian Science Festival.
1995	The SSF organises the annual conference on enhancing technological development (since 2001 Noordung Frum).
1995-1997	The SSF organises the network “Slovenian Science and Technology Park”.
1996	The SSF co-founds the House of Experiments, the first Slovenian hand-on science centre.
1997/8	The SSF takes part in planning the new monthly TV series called “Zenith” for national television station (TV Slovenia).
2001	<ol style="list-style-type: none"> 1. Joint annual project with “Delo”, the Slovenian newspaper with the largest circulation, begins. 2. Joint project with “Finance”, the first Slovenian financial newspaper, begins. The SSF gives initiative and acts as a co-editor of the new monthly edition on science, technology and capital.

3. Programme “Public Understanding of Science and Technology” faces new challenges of the first decade of 21st Century

The SSF as an organisation aiming to enhance and promote science in Slovenia builds its programme “Public Understanding of Science and Technology” on the experiences gained during the period 1994-2001 and on challenges of implementing the “Science and Society” Action Plan of the European Union and State Development Programme of the Republic of Slovenia (both adopted at the end of 2001).

The efforts to improve science literacy and culture are common to both documents and also to the programme of the SSF in the area of improving public understanding of science and technology. The goal is to “create” the citizen capable to understand the events in the field of science and technology, to participate in the democratic dialogue regarding the questions dealing with the field of science and contemporary technologies, and to manage affairs related to the implementation of national and EU’s science and technology policy.

Slovenia, which is presently the candidate for a full membership in the European Union, wants to follow the endeavours of the EU. It also wishes to adopt the national programme, which is in accordance with Slovenian environment and possibilities. The objective of the SSF is to implement the activities that will encourage:

- the interests of citizens to acquire new knowledge about science and technology events and discoveries (e.g. annual Slovenian Science Festival),
- the discussions about matters related to science and technology policy and the law (e.g. by organising the Noordung Forum),
- the media to present the scientific and technological discoveries, achievements and events to publics,
- the scientists to actively promote their research achievements and to popularise science and significance of contemporary technologies,
- the decision-makers to openly discuss and present problems that are of public interest and to try to solve them by using new scientific discoveries.

The sufficient level of scientific culture and literacy are the foundation for the next two levels needed to be achieved. These two levels are:

- responsible behaviour of scientists regarding the ethics and rules;
- bringing science and technology policy closer to citizens.

The last level can be achieved by organising public discussions on present issues regarding the field of science and contemporary technologies. To attain this level the SSF is planning to use two, successfully established, mechanisms. They are the annual Slovenian Science Festival and Noordung Forum. In addition, it will also develop the new forms of communication and of discovering the public interests and needs. Comprehensive programme and qualifications of the SSF will justify the role of the SSF in the process of implementing the “Knowledge-based Society” as a sub-programme of the State Development Programme for the Period of 2001-2006.

Presented environment of the last decade of 20th Century that shaped the development of the Slovenian national programme “Public Understanding of Science and Technology”, the content and complexity of this programme and its connections to the national and pan-national programmes and to action plans at the end of year 2001, reveal the complexity of the situation. Clear understanding of this complexity and situation will enable us to develop successful sub-programmes to improve better understanding of science and technology. Only then, we can expect better understanding of scientists by general public and vice versa.

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