The Public and New Media: The InsideScience Project

Le public et les nouveaux médias: le projet InsideScience

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Summary
Science communication is no one-way road – it needs dialog with the public. This dialog is initiated by new video and online formats illustrating complex issues and presenting the researchers in a very authentic manner. Dissemination via Web 2.0 communication channels and a semantic knowledge space provides the public with easy and interactive access to the films.
Keywords
public, new media, web videos, science communication, participation, collaborative research centers

Résumé
La communication scientifique n'est pas une voie à sens unique - elle a besoin de dialogue avec le public. Ce dialogue est initié par des nouveaux formats video et en ligne illustrant des questions complexes et présentant les chercheurs d'une manière très authentique. La diffusion via des canaux de communication Web 2.0 et un espace de connaissances sémantiques fournit un accès facile et interactif aux films au public.
Mots-clés
le public, nouveaux médias, web vidéo, communication scientifique, participation, centres de recherche collaborative

Introduction

At the Karlsruhe Institute of Technology (KIT), the participants of the InsideScience project (http://www.kit.edu/insidescience) are testing new video and online formats to convey complex issues of research and to interact with the public. Among the topics covered are Computational Theoretical Particle Physics and Humanoid Robots. Research in these fields is accomplished within the framework of two collaborative research centers at the KIT [1].

The Concept of "Public Science"

New Conceptions in the Digital Age

The InsideScience project is theoretically based on a revision of the "public science" concept in the age of new media and the internet. Already in the late 1960s the popular science presenter Heinz Haber used the term "public science" (German "Öffentliche Wissenschaft") for the process of conveying science to laymen contrary to the popular science formats used at that time (Haber 1968; Möhn 2000). This term introduced two always repeated arguments in the university and technocracy debate of that time: The fact that the knowledge level of the population is important to democratic science policy decisions and the fact that science has to become public in order to legitimate its funding (Kohring 2004, p. 162).
In the German language area the conception of "public science" for dialog-based science communication appeared for the first time in 1999 in an honorary publication of the IAK | Institute for Cultural Studies (German: Institut für Angewandte Kulturwissenschaft) in Karlsruhe, the predecessor institution of the ZAK | Center for Cultural and General Studies (German: Zentrum für Angewandte Kulturwissenschaft und Studium Generale). This publication referred to the development of a profiled "Öffentliche Wissenschaft (public science)" in the form of conferences and series of presentations as a prerequisite for the development of a discussion platform on which scientists, politicians and the interested public can exchange information (Robertson-Wensauer 1999, pp. 20 – 23). The term "public science" referred to the impetus of the Bodmer Report of the Royal Society (1985), but also considered the deficiencies of the report, in particular the assumption that quantitatively improved communication automatically increases societal acceptance. The Karlsruhe concept of "public science", however, is based on the assumption that all scientific disciplines profit from the various knowledge backgrounds of people outside of this subject area, if traditional and new communication paths are applied to communicate aspects of relevance to society and to give new impulses to science. This feature considerably facilitates adaptation to new media, defending the idea of authentic, sustainable and useful scientific content for society on the internet. This approach becomes particularly apparent in the InsideScience project.

Public Science in the InsideScience Project

To establish an authentic communication between science and society the project team realized various video formats providing deep insights into the fundamentals of particle physics and robotics even beyond the presentation of research at KIT. Apart from introductory contributions, in-depth and explanatory films were produced which may initiate a dialog. Socio-critical contributions were aimed at initiating discourse.

Through participative dissemination on the internet public opinion on scientific topics was to be determined or direct interaction was to be achieved.

In this context evaluation of the project is also part of the communication process: For every video and on nearly every used platform the team offers feedback channels for commenting and evaluating the contents. These channels are looked after by a social media manager, who often acts as a moderator between scientists and the interested public.

From the Sketch to the Film: Video Production

Hand in Hand: Scientists and Media Representatives

Young scientists working in the field of computer-supported theoretical particle physics or humanoid robots cooperate with journalists, filmmakers and cultural scientists from the Public Relations and Marketing Service Unit (PKM) and ZAK | Center for Cultural and General Studies at KIT in order to produce more than 40 videos for making research understandable. Together they developed ideas for the films, wrote the script, discussed the actions of the scientists in front of the camera and the use of animations. Producers and scientists were equal partners in the fine work on the films.

To prepare this cooperation, the project team had long and intensive talks with the scientists. This gave rise to an exchange that is often impossible in routine institutional science communication. This way the team succeeded in winning several scientists from the two collaborative research centers for the film medium, for appearance in front of the camera and for the dialog with the public.

Authenticity and Clarity – Appearance and Animation

The videos use a didactic film mix: In real sequences the researchers describe basic concepts and processes in order to explain their scientific approaches and results. They are authentic and venture to explain their complex research with simple means, for example small drawings on a blackboard or virtual billiard balls on a table. Nearly all of the participating scientists appeared in one of these videos.

Animated sequences show the inner life of machines or use visual metaphors in order to illustrate highly abstract methods and progress. They give insight into theoretical models, for instance by comparing the Higgs field with a honey jar [2], or into the changes of the interior of a machine, the outside of which

appears unchanged, for instance into the humanoid robot ARMAR [3]. The duration of the films is between 5 to 14 minutes. In these films, one or several scientists explain basic scientific concepts and complex research processes. Feature films and films with dramatic and fictional elements, such as the 28 minutes long socially critical documentary "Do robots go to heaven? A journey through the history of robots in society", allow longer formats.

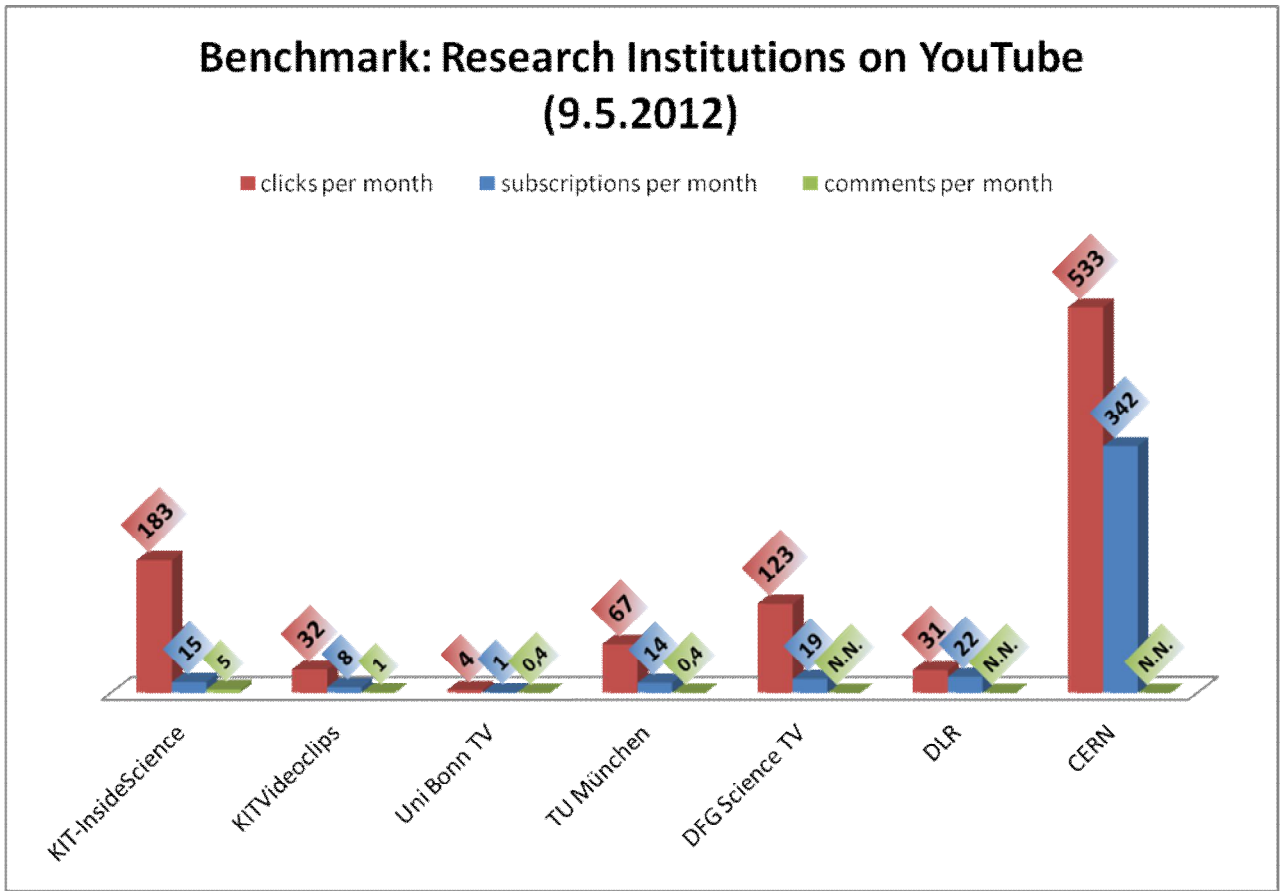
Media Training for Scientists

To prepare the scientists for their appearance in front of the camera, ZAK and PKM offered media training with experts in science communication and television. It was intended to help them to interact with the media, communicate confidently and authentically with the public and appear in front of the camera. The participants experienced themselves in various interview and conversation situations and were provided with feedback. In addition, practical exercises provided the scientists with options for the case of being met by skepticism and criticism with respect to the subject of their research.

In Dialog with the Public: Dissemination Strategies

Dissemination via Video portals, Social Networks, and Blogs

To reach the public with the videos the project pursued an online-based strategy of dissemination: It disseminates the videos via the KIT homepage, via science portals having a large range, such as www.spektrum.de, golem.de or hyperraum.tv, via social media channels like Facebook and video platforms like YouTube or Vimeo and via video blog postings at the InsideScience blog. Especially regarding the numbers of clicks on YouTube, InsideScience was quite successful compared with other institutions in Germany (see Figure 1).



Data	KIT-InsideScience	KITVideoclips	Uni Bonn TV	TU München	DFG Science TV	DLR	CERN
Videos	21	92	84	30	254	146	123
Clicks	19173	58604	10164	60180	1063244	32922	3539079
Subscriptions	77	156	36	429	643	738	18477
Comments	25	21	11	11	N.N.	N.N.	N.N.
Runtime	5 months	20 months	31 months	30 months	34 months	34 months	54 months

Figure 1: Benchmark: German Research Institutions on YouTube (May 2012). Note: CERN is listed as a reference of good practice in other language areas.

However, the interaction on social media channels is still in a trial phase. The postings on our blog and social media sites are basically useful references to interesting video content, interviews or articles about particle physics, robotics and science communication. We also inform about new InsideScience video content and our own events. On Facebook, the project has had 77 “likes” (current as of 29/8/2012) since its start on 29 March 2011 (with own video content since December 2011). The InsideScience “likes” index experienced an increase of 20.63% in July 2012 after the presentation of the second movie season

on humanoid robots in a local cinema and its weekly dissemination on Facebook. The virality of the postings is better on video content and event notifications.

Furthermore, the project partners publish their impressions gained during the development process of the videos in a Wordpress blog with KIT corporate design that is also aimed at entering into a dialog with the public. Some 40 articles have been published so far, all of them written by media professionals and cultural scientists. The scientists of the research centers participated on the blog with interviews or occasional ad hoc collaborations, as in case of the posting “New evidence on the origin of matter at the Tevatron” (6.7.2011) which served as basis for a KIT press release. The most popular blog posts are announcements of events or texts with scientific claims like the Call for Papers for the InsideScience Conference on "Public Science and New Media" in December 2011. The most commented postings are controversial topics and reviews about our own events. The blog also functions as a training ground for the distribution of web videos as video blog posts.

Pupils Projects and Film Presentations

The project team relied on face-to-face exchange with the public. It invited pupils to talk to scientists and to produce their own video about particle physics. This project aimed to improve the media skills of pupils and aroused their interest in particle physics and science communication. In addition, the films by pupils function as a multiplier of the project (8.4% of visits, current as of 29/8/2012) because they appeal to younger audiences. Finally the project partners discussed their results with artists, scientists, students and visitors at a conference in Karlsruhe as well as at two movie premieres in a popular cinema in the city (Filmtheater Schauburg) and at the Center for Art and Media Karlsruhe (German: ZKM | Zentrum für Kunst und Medientechnologie Karlsruhe).

The Semantic Knowledge Space

At conferences and public events the project partners presented a tool, by means of which the public can watch the videos interactively: The semantic knowledge space. The team realized its first step with the free Mind Map tool Spicynodes and later on with the multimedia platform Flash. The knowledge space represents an online area that may also work as an informal learning setting in public spaces. Contextualization of the produced material was considered most important to generate a functional video archive that is attractive for a heterogeneous public. Contextualization of knowledge in archives also preserves the original meaning of the content (Grau 2004; Warnke 2003). The InsideScience project team

used cognitive concepts of knowledge construction and conceptions of media theory and media arts (Fleischmann 2004).

Knowledge Space for Theoretical Particle Physics

For theoretical particle physics the team implemented four types of the knowledge space: A text-based version for the museum and public spaces, a text-based YouTube version for internet users and two pictograms-based versions for public spaces and for use on the internet. For the exhibition of the knowledge space at the InsideScience conference at ZKM in December 2011 an interactive floor projection was installed. It resembled a particle field that reacted like a Higgs field to movements of the visitors. This installation was an effective eye-catcher to attract visitors to the knowledge space.

Knowledge Space Relating to Research into Humanoid Robots

The films about humanoid robots can also be experienced by the public in a knowledge space for Web 2.0 and the museum. The team has distributed the contents on a freely movable graphic showing a board with microchips as clickable elements. Along the conduction paths the visitor can explore the board. Behind every microchip information on the corresponding topic is offered. The corresponding video is embedded in a contextual video player with transcriptions, subtitles, feedback form and Web 2.0 tools.
InsideScience knowledge spaces are located at http://insidescience.forschung.kit.edu/wissensraum.

Preliminary evaluation

Dialog-oriented concepts need evaluation methods other than a top-down communication of knowledge, even more so if they are mainly based on online and moving image formats. In line with the experience gained from e-participation (cf. Gräf 2010 Gräf 2010; Kukartz 2009; Rosa-Luxemburg-Stiftung 2004; Initiative ePartizipation 2005; Initiative D 21 2010) and the practice of evaluation of PCST activities [4] (Neresini/Pellegrini 2008) the InsideScience team uses hybrid methods which include both standardized evaluation methods, such as the classical questionnaire, as well as online feedback functions and automatic statistics. The methods that are currently in use can be summarized as follows:

a. Investigation of user behavior by automatic data collections on web video platforms;
b. acquisition of opinions by interpretation of comments in various web contexts;
c. online feedback and classical feedback methods, such as standardized questionnaires and interviews at events (see figures 2 and 3).

This mix of methods ensures quality of the project through continuous data comparison and citizen participation and helps to analyze the potential of the contributions to initiate social discussion. Moreover, it contributes to studying communication and exchange processes that have not yet been analyzed in depth and thus opens up a discussion about the practice of evaluation of participative moving image communication.

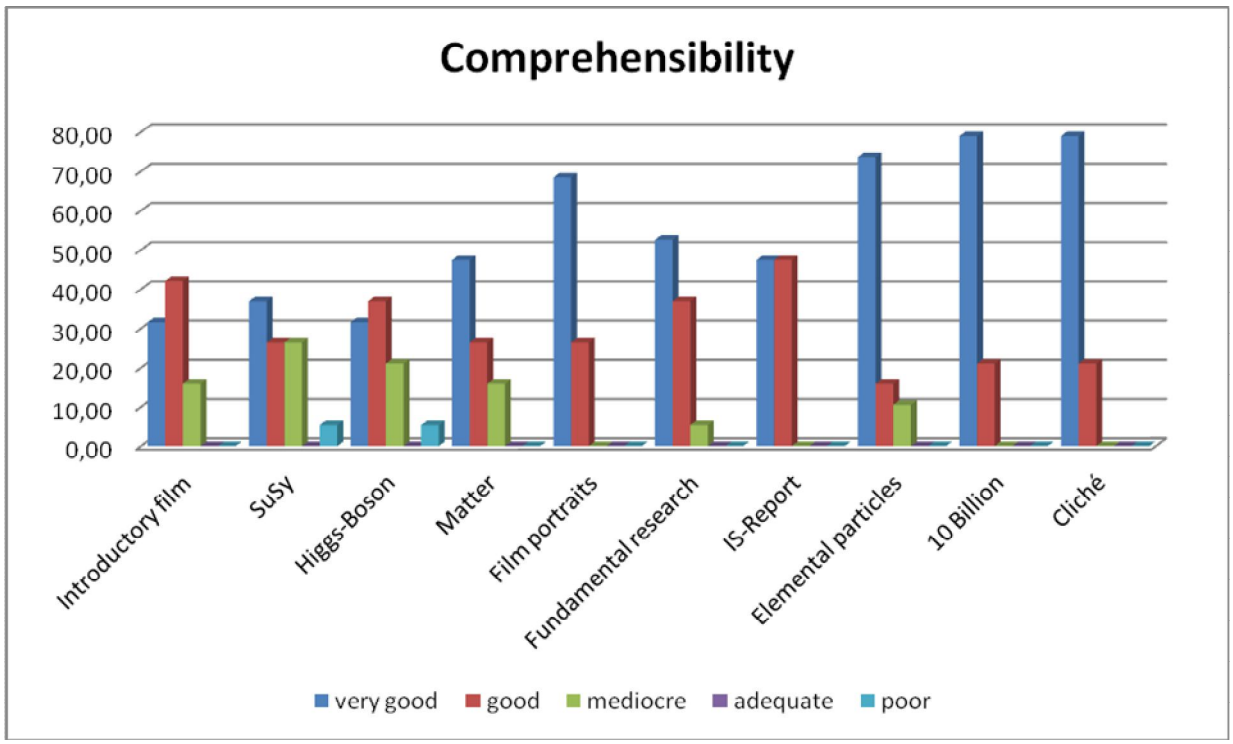


Figure 2: Sample on Videos about Computational Particle Physics. Results of standardized questionnaires on the comprehensibility index of InsideScience scientific movies. ZKM Karlsruhe, December 2011.

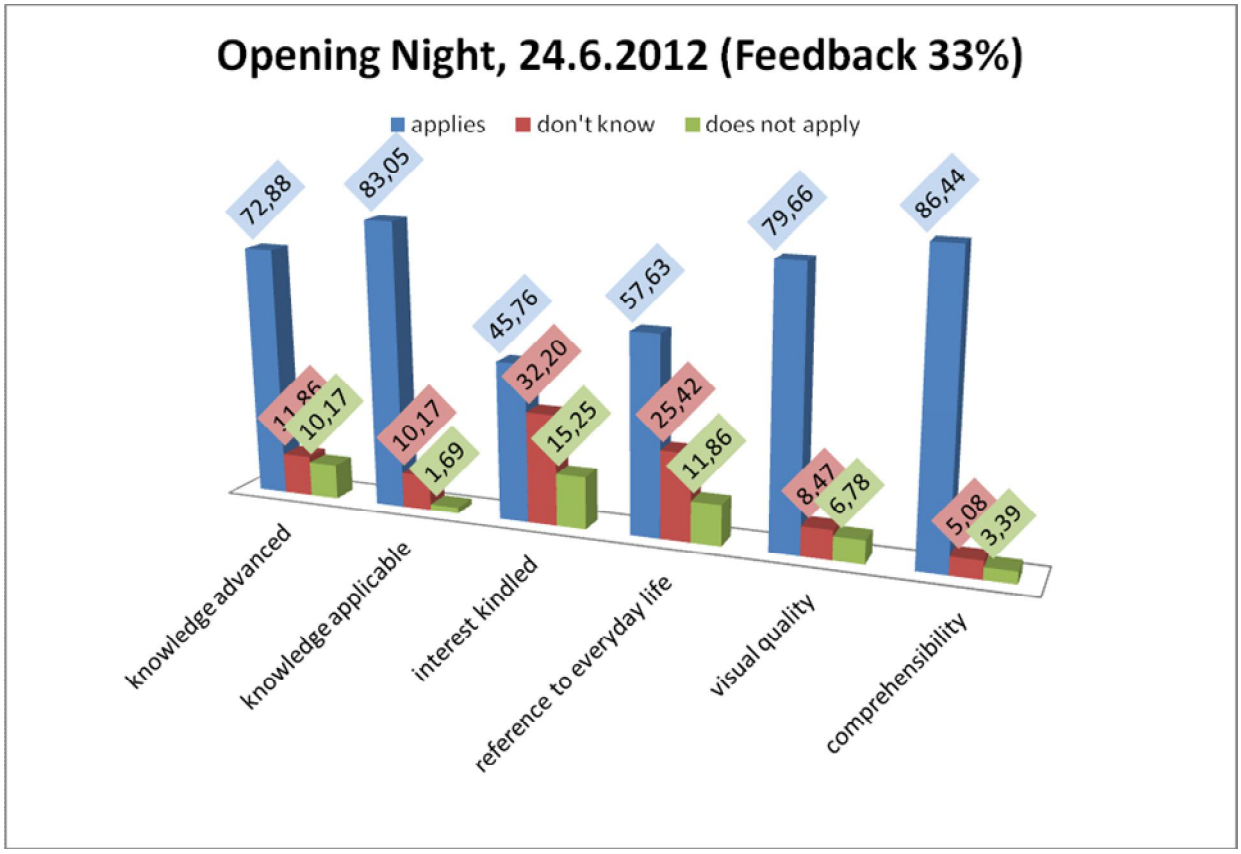


Figure 3: Sample on Videos about Humanoid Robots. Results of standardized questionnaires on knowledge expansion, interest, visual quality and comprehensibility index among other things. Filmtheater Schauburg, Karlsruhe, Juni 2012.

Notes

[1] The German Research Foundation (DFG, Deutsche Forschungsgemeinschaft) funds the collaborative research centers "Computer-supported Theoretical Particle Physics" and "Humanoid Robots – Learning and Cooperating Multi-modal Robots". It also funds the InsideScience project (duration until 2012).

[2] This comparison is used in the film "Wie bitte entsteht überhaupt Masse? Die Suche nach dem Higgs Teilchen" (How Does Mass Develop? The Search for the Higgs Particle) in the first series of InsideScience films. (http://www.youtube.com/watch?v=URB0nHNuUZE&list=UUAaGGdLHIEpY5isJOfy1J3g&index=2&feature=plcp).

[3] This is shown in the film "Programmieren durch Vormachen: Wie Roboter von Menschen lernen" (Programming by Showing: How Robots Learn from Man) in the second series of InsideScience films. (http://www.youtube.com/watch?v=il5iE_q2y5g&list=UUAaGGdLHIEpY5isJOfy1J3g&index=6&feature=plcp).

[4] PCST means Public Communication of Science and Technology.

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