Assessment of Physicists and Journalists toward Media Coverage of Physics News in Mexico

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Introduction

Direct relationships between journalists and scientists are being increasingly narrow probably as an effect of the boom of the information and communication technologies (ICT) and a more positive attitude on the part of scientists to carry out and benefit from the promotion of their work (Revuelta, G. 2013). However, in several reports this relationship has been described as complicated (Reed, R. 2001). S. Dunwoody (1999) describes it as "complicated dance" that responds to different ways of working and of perceiving the world: the journalist probably has a better sense of what will be interesting for people, meanwhile the scientist is probably more concerned that his work is accurately reported in order to avoid revilements from their colleagues (Friedman, S. 1988). Some authors have described journalists more concerned in entertainment and information "rather than scholarly communication and paternalistic public education on behalf of science which is desired by scientists" (Peters, 1995). This differences generate opposing views on how to cover the subject, on the more suitable structure (in terms of what it's the most important thing to report), the length to tell the story, or even the accuracy of headlines and editions[1].

Although disagreements between journalists and scientists on how to properly report science is an issue broadly mentioned in the international literature, there are several other studies that show that working relations between journalists and researchers have improved (Valenti, 2000) and problems such as lack of precision, lack of involvement, cooperation, "researchers' fear of misrepresentation, inaccuracy and loss of control, seem to be diminishing" (Wien, C. 2014).

[1] Part of this discussion was briefly described by Ananyo Bhattacharya in his article "Nine ways scientists demonstrate they don't understand journalism", published in *The Guardian* in 2012, and then critically answered by the biologist Andrew David Thaler in the post "Nine ways journalists demonstrate they don't understand science" published in his blog Southern Fried Science.

In Mexico, however, there are no studies that assess their liability in the way science is finally reported in the media. This paper aims to look into scientists and journalists' points of view in order to determine if this improvement in their relations is happening or not, and to find clues to foster it through effective communication strategies at the Institute of Physics at the National Autonomous University of Mexico (IFUNAM).

In September 2011, the Communication Unit (UCIF) was established at IFUNAM. It was one of the few formal offices with staff specialized in science communication at the University and in the country. The UCIF was founded with a specific objective: to disseminate activities through 'news' stories that not only describe the research made at the IFUNAM but also include scientific explanations that would allow a non-specialist audience to understand them. This Unit sought to position the IFUNAM's research themes in the media through a closer contact with them and to analyze their coverage. We thus started monitoring most of the news related to the Institute appearing in the mass media (newspapers, magazines, radio and TV).

In more than two years[2], a total of 121 science articles reporting issues from IFUNAM in different areas were detected: research (58), physicists' opinion on other scientific topics (23), institute's community (20), science promotion made by researchers (11), and science policy or financing issues (9).

However, a formal evaluation of IFUNAM's penetration in the media should go beyond the number of articles published or programs broadcasted. Hence, here we show an exercise that can be used to analyze how the themes of the Institute are reported in the media and how they are evaluated by the journalists and scientists involved.

Methodology

We chose 18 items covered by the media where a research project from IFUNAM is the main topic of the story. We selected stories on 'research' only, because we wanted to focus on the ones whose authors would require some understanding of science to carry them out. We also selected one article from each media, each scientist and each journalist in order to have a diverse sample of stories. The topics varied from medical physics, experimental physics applied on arqueology and radiation to

[2] Our period of analysis goes from September 2011 to March 2014.

theoretical physics and complex systems. The type of stories also varied: printed articles (one page), complete radio broadcasts (23 minutes) and TV news break (5 minutes).

We distributed two questionnaires: one to the reporter who authored the article/program and another to the scientist whose work was covered[3]. After one month we got 10 stories completed which means that the journalists and scientists[4] involved in them answered the questionnaires.

The final selection of stories appeared on newspapers (3), radio (3), news agencies (2), TV (1), and we also included one story developed at the Communication Unit which was published on IFUNAM's website (See Fig.1).

	HEADLINE	MEDIA	DATE	JOURNALIST	SCIENTIST
1	"Nuevo dispositivo de silicio y plata que amplifica la luz"	Gaceta UNAM (University newspaper)	5/01/2012	Patricia López	Alejandra López Suárez
2	"UNAM practica tomografía"	Reforma (Newspaper)	13/08/2013	Diana Saavedra	Arturo Menchaca
3	"Alista UNAM laboratorio para análisis de muestras y datación"	La Crónica (Newspaper)	7/05/2013	Reyna Paz	Corina Solís
4	"Caminantes aleatorios"	Radio Fórmula (Radio)	24/04/2014	Tlanex Valdés	Octavio Miramontes
5	"Patrones animales"	La esencia de la ciencia (Radio)	24/02/2013	Javier Crúz	Lorena Caballero
6	"Bosón de Higgs"	Todo se aclara (Radio)	14/08/2013	Lilia Silvia Hernández	Genaro Toledo
7	"Crean nanopartículas metálicas"	Academia Mexicana de Ciencias' (News Agency)	31/07/2013	Noemí Rodríguez	Juan Carlos Cheang
8	"Elementos radiactivos hasta en el café..."	Ciencia UNAM' (News Agency)	04/03/2013	Sofía Flores Fuentes	Guillermo Espinosa
9	"Analizar el VIH en el organismo"	Creadores Universitarios (TV)	19/03/2014	Alejandra González	Carlos Villarreal
10	"Aprendiendo a aprender"	UCIF	16/10/2013	Denisse Joana Flores	Élfego Ruiz

Figure 1

The questionnaires were designed to give us information towards the perception of scientists and journalists prior and during the interview and about their thoughts on the final product. Both were asked to evaluate a) the final product in terms of how accurate was the research reported, b) their own role in the news' making process: how well they were prepared for the interview, how accurate were the questions/answers,

[3] We first send it to the reporters because they were more difficult to reach. Once the reporter answered, we sent it to the researcher involved. There were 2 researchers and 3 journalists who didn't answer the questionnaire, and other 3 reporters who we couldn't find. Those 8 stories were dismissed.

[4] Eight of them are senior researchers and two are PHD students. All the researchers usually appear in the media and are accessible with reporters.

how flexible were they during the edition process, etc. and c) to provide advice on how the Communication Unit would help them to improve their activity[5].

Results

In most cases, the first contact between journalists and scientists was through the Communication Unit (6 of 10). There was no specific time from the first contact until the interview takes place since it varies from one day to one week. As for the previous preparation for the interview, 9 of the 10 reporters claimed they did some preparation, while only half of the scientists responded they did it. Journalists prepared the interview in a similar way: 9 out of 10 conducted desk research and some of them also investigated the scientist through conferences, previous interviews and scientific papers on his/her work. In fact, when asked about the sources consulted to prepare the interview, most journalists mentioned scientific papers (it was the option with the highest percentage, 31%). In contrast, the preparation of researchers was more diverse and less clear: 'I prepared the subject to make it more accessible'; 'Too much time'; 'An outline of important points'; 'Graphics'; 'Reading popular articles on the subject'. When asked if they noted that journalists prepared the interview, most scientists (8 of 10) said yes. They said they noticed it by the type of questions that were, in general, thoughtful and relevant to the topic. In only two cases the researchers noted a lack of preparation because 'the questions were standard without signs that reflect a major revision' and 'the reporter just wrote without asking too many questions'.

All of them were asked to rate the questions. They had to choose two of the six options: informative, critical, basic, personal, contextual, scientific[6]. Scientists said journalists posed more informative questions (50%), followed by basic (22%) and scientific (22%). Reporters' perception about their own questions is more diverse: informative (36%), scientific (32%), critical (14%), contextual (11%), basic (7%) and personal (4%). There was an exact match in the rating of the responses of researchers: both groups (8 of 10, each) agreed that researchers' answers were 'concise and useful '.

[5] Both questionnaires had 17 questions and were made through Google Docs.

[6] We defined each type of questions as the following: a) Informative: they look for examples, demonstrations or analogies to help understand something. b) Critical: seeking to question and contrast their research. c) Basic: what do you do? What is X thing? d) Personal: looking for opinions or personal anecdotes. e) Contextual: looking for data to 'locate' an event in space and time. f) Scientific: addressing the scientific process of the research.

All journalists described the scientists' language as "Clear, suitable for non-experts" and most scientists (7 of 10) described it in the same way. Six of the 10 reporters sent his note to the researcher. And of those, only two had significant changes.

In terms of the 'quality' of the final story, in both cases the result was positive. For seven researchers the final product was 'good' and three described it as 'excellent'. All reporters rated their product as 'good'. All claimed to have reported science correctly. With only one exception, researchers agreed. When asked how they noticed the stories contained science, scientists' answers vary, however, they can be classified into 3: 1) Good content: data is coherent to the information they gave in the interview; 2) Good language: properly used and accessible terms; 3) Impact: caught the attention of people. Reporters' answers were more specific: 1) Good content: they explained the process of research and specifications of technology, they raised scientific arguments, the explanations of concepts are successful, they explained the process and not just the results. 2) Good language: understandable, used colloquial terms, with examples and analogies following in many cases what the researcher said. Journalists do not mention the impact criterion but they added a new one: 3) Revision: the story was reviewed (and approved) by the researcher. We also asked scientists how stories could have been better. Some of them mentioned that the reporter could have better prepared the interview, talked to the researcher previously, or sent the story for a review (in the cases this did not happen). The last question has to do with the work of the Communication Unit and how it can help both to do their job better. Researchers suggest a closer contact to the communication committee at IFUNAM to constantly have 'fresh' news and updates. While one suggested to increase the dissemination of topics IFUNAM ("by saturating the media"), another proposed "not to communicate everything" but to select the subjects that may have more impact. Some of the researchers proposed to send catalogs of scientists with their respective research topics to the media. Reporters, meanwhile, suggest to have a permanent catalog of issues that they can cover. Some emphasize the need to provide them digital (directories and glossaries) and audiovisual (photos, graphics, videos of researchers) materials to help them understand and better communicate these issues.

Discussion

This exercise, though limited and statistically insignificant, provides some relevant information to UCIF in order to meet needs of journalists and scientists, to

study the way they see each other and their role in the media coverage. It also gives us several topics for discussion and research such as the work prior the interview, the use of language and the search of methods to help scientists to communicate their message clearly, the advantage or disadvantage of sending the story to the scientist, and the criteria to evaluate if a story has science or not. It is relatively clear for journalists how to prepare an interview: they usually make research on the topic and the interviewee. However, it is not clear enough for scientists how they should be prepared for an interview. This is an area of action for UCIF. The exercise also puts emphasis on the objective of science journalism under the 'watch dog' model[7]. If critical reporting is one of the main functions of journalism (in consequence of science journalism) this exercise suggests the model is probably not being achieved because of 1) the lack of critical questions during interviews (most of them are informative) and 2) the apparent imperative need of journalists and scientists to send/check the article before publish it. Even many of them see this action as a criterion that improves the quality of the final product, which would be an opposite position to the journalism's principles of independence, impartiality and, again, critical thinking[8] . It is not clear how the Communication Unit could promote a critical coverage and it would bring a pertinent debate if it is part of their roles or not.

Finally, the most interesting issue that reflects this exercise is that the overview of both journalists and scientists on the final products is that they are good or excellent (not even one was rated as "acceptable"). The positive and naive interpretation of this would be the excellent coverage by the media to IFUNAM investigations. But it also would mean that scientists and journalists are the ones who 'receive' the information, which is blatantly false. Hence, this puts UCIF in the next step of the evaluation strategy: the public and their own evaluation on how clearly, attractively or critically was the research reported. Anyway scientists and journalists' answers may give a base to evaluate each final product according to three criteria: a) Content b) Language c)

[7] According to Waisbord (2000) and Jebril (2013) according to this paradigm model "journalists should carry out an investigative and watchdog role on behalf of the public which finds expression in an objective, factual, and critical reporting style.

[8] Neil Jebril (2013) describes the Watchdog journalism model focused on a political sphere. He says that "when journalists assume a critical stance toward the state, they become representatives of generalized public opinion, and their discourse is distinct from the discourse of parties and politicians (Norris, 2000). Watchdog journalists have often been adversarial and skeptical in their coverage (Patterson, 1998)". In science journalism, we understand journalists are indeed critical of officials and their policies but also of their main source of information: scientists. This would mean not showing cience as wonderful and true but open to external scrutiny and evaluation.

Impact. But information is still needed to describe each of them. A last issue of analyses about this apparent positive cooperation perceived by both parties has to do with the profiles of people who were involved in the exercise: scientists who are usually used as source in the mass media and journalists whose main activity is science communication. It would probably mean trained researchers work better with science journalists. And further research is needed to compare these results with those cases where non science journalists nor researchers cooperative with media are involved. This work may be useful to strengthen the communication strategy at the IFUNAM and perhaps in other science institutes interested in supporting media to improve their science coverage without compromising their independence.

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