

Study on the Effects of Internet for Science Communication in China

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Abstract--With the continuous development of Internet technology, not only the number of Internet users is increasing, the contents of dissemination are abundant, but also communication forms change rapidly, such as micro-blog, micro message and so on. For science communication, Internet has become an effective scientific communication media, and plays a great role in communication. But at the same time, the spread characteristics of Internet itself also can produce some negative effects during the communication process.

The main content of this paper is the analysis of the positive and negative effects of Internet for science communication in China, and explores the fundamental reasons that make the two side effects, so as to find the better ways to using Internet for science communication.

To be specific, this paper includes three parts: the first part is the analysis of the positive and negative effects of Internet for science communication through the Shanghai World Expo, robbing salt storm, and so forth; the second part is through the analysis of the propagation characteristics of the Internet to explore the fundamental reasons that make the two side effects; the third part gives some proposals about how to make better use of Internet for science communication.

I. INTRODUCTION

The emergence of Internet is undoubtedly a major and revolutionary breakthrough in the history of communication. With the continuous development of Internet technology, the contents of dissemination are abundant more and more, and communication forms change day by day, so that the number of Internet users is increasing. According to the 33rd report of China Internet Development Statistics by China Internet Network Information Center (CNNIC), to the end of December 2013, the scale of Chinese Internet users had reached 618 million. Internet penetration was 45.8%. Among them, the scale of mobile phone users reached 500 million, the people proportion increased to 81.0% [1]. As a representative of the new media, compared with the traditional media, Internet provides a more informative, efficient and effective dissemination platform for the public. This media has become one of the most important communication tools for the moment. Specific to science communication, the role of Internet during the dissemination process is also increasingly highlighted, and in many ways, Internet enhances the effectiveness of science communication. But at the same time, the spread characteristics of Internet itself also can produce some negative effects during the communication process.

II. POSITIVE AND NEGATIVE EFFECTS OF INTERNET FOR SCIENCE COMMUNICATION

A. Positive effects

1. Science communication channels are greatly expanded

In China, with the development of Internet, science communication channels are greatly expanded. The data of *China Association for Science and Technology Yearbook 2013* show that the number of science and technology websites has been 2182[2]. Specialized websites for science popularization have mushroomed and become the new position of science popularization. It has a significant role for promotion and popularization of scientific knowledge. The data of the latest science infrastructure survey show that 618 websites for science popularization have been built in China, the absolute number of the websites is increasing year by year. Today, these websites have covered 30 provinces, municipalities and autonomous regions [3].

2. The content of science communication has been greatly enriched

As a new media, Internet capacity is far greater than the traditional media. Now, everyone can become a source to publish information, and numerous sources of information as the trickle brought together into ocean of information. The information contained everything what one expects to find spread to the audience through hyperlinks technology and other technologies, really realize the global information sharing. To science communication, the contents of science communication naturally also have been greatly enriched.

3. The forms of science communication have become vivid, and communication effect can be strengthened

With the support of multimedia technologies, Internet communication break the gap of technology between traditional media forms, while focus on the traditional media advantages, making the text, data, sound and image be extracted and converted to hypertext what people want. So forms of science communication through Internet are more and more diversify. Video and audio on the web have been common. A virtual museum, network live, interactive games and so on are also more likely to be used by the website so that to make science communication more interesting and vivid, and the effect of communication be strengthened.

4. Timeliness of science communication is strengthened

Any communication is conducted at a certain time and space. Timeliness is the most prominent feature of Internet communication. If there is a network, the event occurred anywhere and anytime can be send out in the first time, and

realize "I see that you see". The use of Internet greatly accelerates the speed of science communication, and help people eliminate all kinds of uncertainties about the perception of things. The feature of Timeliness not only reduces the attenuation and distortion of information during the communication process and the cost of information communication, but also directly promotes the development of politic, economic and cultural.

B. Negative effects

1. Ensuring the scientific and accuracy of science communication contents is difficult

Because Internet is an open platform and anyone can publish information, the scientific and accuracy of science communication contents can not be guaranteed. Communicators' credibility is also reduced. Anyone can express their views and opinions anywhere and anytime through Internet, so during the process of science communication, there are also difficult to distinguish right and wrong. It is not conducive to science communication.

2. Media noises are strengthened; public opinion is difficult to control

The interactive feature and unprecedented freedom of representation right of Internet make the role of noises be strengthened during the process of science communication. A lot of useless or harmful message appeared and caused information content redundancy and false. The information often interferes with science communication. Because of increasing negative information, public opinion is difficult to control. Even many irrational events occurred in China, such as "grabbing salt storm", "grabbing vinegar storm" and so on, leading to social psychological panic and social order destruction.

3. Non-science communication is carried out in the name of science communication

Internet has indeed made rapid development of science communication, but also because of this convenient communication tool, there has been a lot of abused and embezzled phenomenon. On Internet, many contents are named by science and technology to swagger through the streets. This so-called science is the use of people admiration on science to achieve its business purpose and advertising effect in the name of science. The real scientific research and the contents of scientific and technological achievements occupy only a few locations.

In addition, pseudo-science and superstition dressed in the cloak of science publicize on Internet. For example, alleged "technology magic pill" cure all claims, "Science slimming tea", "scientific fortune-telling" is also not uncommon. It has become a trend that non-science communication takes advantage of science communication, required remediation immediately.

C. Case study

1. Positive case study—"Online World Expo"

"Online World Expo" is an important part of the 2010 Shanghai World Expo in China. It formally launched on May 1, 2010. This is a comprehensive, international online platform to serve the 2010 Shanghai World Expo collected referrals, guidance, exhibition, education four functions in one set.

"Online World Expo" makes full use of all kinds of multimedia tools. "Webcast" can provide simulation experience, interactive games, virtual and other means to lead the people roaming the Expo site, in-depth experience Expo pavilion. This is the most characteristic of "Online World Expo".

"Online World Expo" developed a large online game named *World Expo for Young people*. Its target users are adolescents. The content includes: popularization of science and technology, Expo knowledge, Low-carbon ideas. We can see this game's communication effect: the game attracts a number of players. In the first three months, total enrollment reached 25,720 people, and the site was visited by 142,523 people [4]. Through the game, we can not only popularize scientific and technological knowledge, disseminate scientific ideas, practice low-carbon life during adolescents, but also enhance the awareness of young people and the natural environment friendly coexistence.

Through the combination of Internet and a variety of techniques, "Online World Expo" shows the most exciting aspect of the World Expo with vivid image, and attracts more domestic and foreign tourists to visit. It is a typical excellent case to use Internet for science communication.

2. Negative case study—"grabbing salt storm"

On March 11, 2011, a magnitude 9 earthquake occurred in Japan, which triggered a nuclear leak to make the globe people great panic. An absurd "grabbing salt storm" occurs in China. The reason that "grabbing salt storm" broken in large-scale and caused people's irrational behavior is the rumors from Internet.

On March 14, 2011, the rumors "iodized salt can prevent nuclear radiation" appeared in Shanghai and Shaoxing in China. On March 15, the information of robbing salt appears in the network. Micro-blog became an important platform for information fermentation. The regions are further extended from Shaoxing, Shanghai to Ningbo, Fujian and other places. This information spread all over the network, and the regions also further expanded on March 16. In not only supermarkets but also markets salt had been mad bought, salt prices soared. The day is the craziest day to grab the salt on March 17. The tide of robbing salt had been all over the country. "Grabbing salt" become a major media headlines. On the afternoon of 17, Chinese government departments issued a document urgently; the relevant departments took emergency measures to ensure salt supply. At the same time, the local government has held a press conference to clarify the rumors. The rumors burst, and "grabbing salt storm" calmed down.

It is not difficult to find the great role of Internet in this event through analysis. The speed, scope and intensity of Micro-blog propagation in the event are enough to prove the effectiveness of the new media communication.

III. THE REASONS GENERATED POSITIVE AND NEGATIVE EFFECTS

A. The basic characteristics of Internet is a double-edged sword for science communication

No doubt, the basic characteristics of Internet including real-time, openness, interactivity, convenience, viscous, sociality and so on play a great role in science communication. But some properties may bring adverse effect for Science communication.

For instance, open characteristic could lead to more text. Many readers can add the content and links above the one text to make the text resources greatly enrich. But at the same time, this open characteristic will allow the content of science communication quite a mixed bag, analyzing the authenticity become a test of recipient of information. It is difficult to ensure the accuracy of science communication.

Social characteristics emphasizes that individual is not isolated, but are connected to each other in a self-organized way to let people, groups, content and application moving full, which brings more users interact and produce rich content. For science communication, the use value of web services and attraction are greatly increased. But it also easy to make the same social network of people accepts these negative effects when scientific thinking, scientific spirit and scientific content have the deviations.

B. The privilege disappearance of traditional "gatekeeper" is one of the main reasons that have a negative impact for science communication

Behind the effect shown by the basic characteristics of Internet for science communication, the deeper reason is that Internet breaks the traditional "gatekeeper" theory [5]. To Internet, the concept of fixed communicators no longer exists. This also makes the old gatekeepers lose the privilege of information dissemination. The information door disappeared. It will inevitably have some negative effects for science communication.

As the examples of blog and micro-blog, they are a highly open cyberspace, virtually unlimited time and space; everyone can freely publish information which will be browsed by other blogs. News gathering and editing power has been not controlled by blog and micro-blog, but in the hands of the blog and micro-blog individuals. The media power as the gatekeeper once is extremely weakened. Centralization of traditional media is generalized. Information dissemination has obvious characteristics of openness and participation. The majority of the blog, micro-blog didn't take words filtering measures so that information check is useless. Meanwhile, free release of information led to the check standard not be unified;

"gatekeeper" power is shared by the user. There are strong individual characteristics when communicators themselves select and check the information, which is impossible to have unified, centralized standards.

C. Internet users have a tendency to group polarization

The concept of "group polarization" [6] was put forward by University of Chicago Law School Professor Keith • Sunstein. As a member of group, while participating in group discussions, differences between group psychology and individual psychology will lead to infection and assimilation by group members; eventually make the individual member "blind" and group polarization.

Facts have proved the occurrence ratio of Internet users in group polarization is much higher than in real life. Why is the network communication more prone to group polarization tendency?

First of all, users have full right to choose when they access to information and participate in online activities, so the crowd gathered under the same theme is easy to form the trend of homogeneity within the group and heterogeneity inter group so that group identity status will appear.

Secondly, hyperlinks, RSS and TAG applications can provide users with a systematic filtered information environment.

By these means, users contacts selective and continue to strengthen the same or proximity information, making personalized information tend to narrow. At last, we can only hear the echo of our own.

Finally, the emergence of blog, micro-blog and other forms of communication provide a broader discourse space and a more centralized speech places for the majority of Internet users so that it easier for users to find their allies to form the same sounds for an event.

Results of group polarization can form massive public opinion, and then change the trend of certain events. But sometimes it is also easy to produce negative effects, such as an irrational voices expanded from group polarization will lead to adverse consequences. "Grabbing salt storm" is a typical case.

D. Internet public opinion has the irrational tendency

Open, interactive and others characteristics and individual modes of transmission such as blog, micro-blog provide convenient conditions for the people to express. Therefore, the public opinion is easier to form through Internet.

The prominent feature of irrational speech is emotional, so it is called emotional opinion. Emotional opinion often forms a one-sided situation, resulted in a social public illusion, so as to mislead the public. It is not conducive to the public's rational thinking. "Grabbing salt event" is the most typical example that people are blinded by the illusion.

This irrational formation is mainly due to Internet is an open network. Internet not only provides a free expression platform and a full vent to emotion space for people, but also makes users hide the true identity and obtain the security of

expression, thus the kinds of concerns they express their opinions in reality are eliminate to a great extent. Even if you lose the social responsibility and self control ability, you can make the natural emotional catharsis become instinct choice in the "popularity" under the mental domination. Therefore, the non-rational Internet public opinion tends to make the essence of the event to the opposite, and cover up the truth.

IV. SUGGESTION

A. Improve laws and regulations, strengthen the network supervision

In order to better science communication, the government should improve laws and regulations associated with the network, strengthen supervision of the contents of Internet science communication. The government should establish effective policies system to promote Internet science communication, including the following aspects: should define clearly the rights and obligations of various government departments, the scientific community, the news media, and public communicators during science communication; should formulate relevant laws and regulations to protect the healthy development of Internet science communication; should combat the behavior making use of Internet to spread pseudo-science, anti-scientific.

B. Strengthen the regulation of public opinion

The Internet enables the citizen's public unprecedented freedom, but this freedom has brought positive and negative effect: On the one hand, it promotes science communication more democratic, transparent and avoids the hegemony of science, science Kidnapped occurred; On the other hand, excessive freedom of opinion makes people not distinguish between truths and false.

Media should strive to create a harmonious environment of online public opinion through guidance of a three-dimensional "agenda-setting", including: strengthening the authority information timely release; the traditional media to participate in online public opinion; playing the role of "opinion leader" and so forth.

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