

Science Communication on TV: An Analysis on Current Status and Communication Competence in China

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Abstract—With the rapid development of mass media, the role of media in science communication is growing in China. Television, as a traditional media of long history, is still the highest coverage and always ranks first in obtaining science and technology information, even Internet is developing very fast today. Television has always played the important role in science communication. The main content of this paper is to analyze the current status and influence of Science and technology communication on TV in China.

The paper consists of four parts: the first part is to introduce the current development situation of TV for Science communication in China, including the status of TV channels and programs. The second part is to study the science communication competence of TV in China from three levels, namely: firstly, the analysis of own science communication ability on TV; secondly, the analysis of science communication credibility on TV; thirdly, the analysis of science communication influence on TV. The third part draws some relevant conclusions through data analysis. The fourth part summarizes the problems and puts forward some proposals.

I. INTRODUCTION OF CURRENT STATUS ABOUT SCIENCE COMMUNICATION ON TV IN CHINA

With the rapid development of mass media, the role of media in science communication is growing in China. Television, as a traditional media of long history, is still the highest coverage and always ranks first in obtaining science and technology information, even Internet is developing very fast today. Television has always played the important role in science communication.

A. The science and education channels and programs in China

1) Science and education channels setting

According to statistics, there had been 50 special science and education channels, including a national one, provincial level 9, and municipal 40 in China. In addition to the national science and education channel CCTV10, a total of 9 channels had been set among 31 provinces and four municipalities directly under the central government, including Beijing, Tianjin, Chongqing, Shanxi, Zhejiang, Anhui, Guangxi, Sichuan and Guizhou. Other provinces and municipalities set up the education channels, documentary channels, agriculture channels and children channels to make up for the lack of science program. Currently, only five provinces did not set up any science-related channels, respectively, Inner Mongolia, Hainan, Tibet, Gansu and Qinghai.

2) The content setting of science and education channels

Chinese science and education channels in the channel and the column settings have the following characteristics:

Firstly, the national science and education channel has high gold science content and more original brand programs. CCTV10 as the national science and education channel has showed influence accordingly and guiding force. CCTV10 currently has 14 permanent programs. The major science sections of 14 programs include: "I love invention", "Approaching science" and "I see", which introduce science around; "The Doctor is in" talking about health and health knowledge; "Light of Science" introducing frontier professional scientific knowledge; "Geography • China" telling the geographical knowledge; the introduced popular science programs "Nature legend" and "Human and Nature". The contents of CCTV10 are high gold and have many original programs. Even if the programs are mainly introduced, there are also increasing original contents until the leading role of Chinese television scientific communication.

Secondly, the excellent science contents of science and education channels under municipalities are in general, and the original contents is less. The characteristics of popular science programs of the municipality directly under the central government are consistent: The channels play more introduced programs than original programs, and replay more time every day; The playing proportion of the popular science program is relatively small throughout the day; With the "Documentary hot", many TV stations set up a special documentary channel to arrange not only the original documentary but also the introduced some foreign documentaries and play both science contents and cultural contents such as Shanghai Documentary Channel and Beijing Documentary Channel.

Thirdly, the plays accounted for relatively high, in contrast to the low proportion of popular science content through the science and education channels of provincial level. Provincial science and education channels have the following characteristics: Playing the dermas and having high proportion; More introduced programs and less original programs about science around.

Fourthly, municipal science and education Channel have less time to play science programs, and basically no popular science content. Television and advertising are more, even if some TV stations are dedicated to the television shopping in science and education channel.

To broadcast in August 2014 as an example, the data are as follows:

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TABLE1 POPULAR SCIENCE PROGRAMS BROADCAST

Channel	Programs	Original program	Proportion of broadcast daily
CCTV 10	6	5	44.6%
Beijing science and education channel	2	2	7.9%
Beijing documentary channel	2	1	19.2%
Shanghai documentary channel	4	1	29.0%
Chongqing science and education channel	5	1	30.0%
Tianjin science and education channel	4	1	28.6%
Shanxi science and education channel	0	0	0. 0%
Zhejiang science and education channel	0	0	0. 0%
Anhui science and education channel	2	1	16.0%
Sichuan science and education channel	0	0	0. 0%

3) Science and education channel characteristics

In general, science and education channels have three characteristics in China. The first one is that popular science programs are made up with humanities, history, society, legal and other documentary program together in science and education channels, and the humanities programs in each channel often are more than popular science programs. The second is that only three kinds of channels including a national one, province and municipality directly under the central government have native design programs. Other TV stations are usually rebroadcast these programs. The third is that many science

and educations channels play dermas and advertisings in stead of popular science programs.

4) The famous science program on TV in China

At present, China's famous popular science program on TV is as in Table 2.

From the sources of the programs, there is a certain percentage of original program and the foreign introduced program.

From the type of the programs, native original science programs are in the form of seminars, lectures and interviews that audience participates highly.

TABLE2 FAMOUS POPULAR SCIENCE PROGRAMS

Program name	Premiere TV	Airtime	Type	Sources
Discovery	Beijing science and education channel	1997	Documentary	Introduced program
Approaching science	CCTV10	1998	Science entertainment	Original program
Human and Nature	CCTV1	1994	Documentary	Introduced program
National Geography	Authorized China's major provinces and cities to arrange their own	2000	Documentary	Introduced program
Fabulous Nature	Simultaneously broadcast around the country	1998	Documentary	Introduced program
Animal World	CCTV1	1981	Documentary	Introduced program
Nature legend	CCTV10	2001	Documentary	Introduced program
I love invention	CCTV10	2009	Interview program	Original program
SAGA	Simultaneously broadcast around the country	2001	Documentary	Introduced program
The Doctor is in	CCTV10	1996	Interview program	Original program
Charm · Record	CCTV1	2012	Documentary	Original program + Introduced program
Exploration·Discovery	CCTV10	2001	Documentary	Original program
China	Shanghai documentary channel	2014	Documentary	Original program
Health & fitness House	Beijing TV	2009	Interview+ Feature film	Original program
Technology Garden	CCTV7	1996	Agricultural science professional program	Original program

B. The quality of science communication on TV continues to improve

In recent years, China's TV media has been improving the quality of science and technology communication through the revision, the introduction of new programs and other means. TV channels and programs continue to reform and innovation so that science communication on TV to further plays a dominant role.

1) CCTV10

CCTV10 appeared with new face on the screen since December 12, 2010. Through reconstruction, CCTV10 increased the popularization and propaganda about science discovery, science knowledge, technology of production and life, and launched four original popular science programs, namely, "Geography • China", "innovation unlimited", "Nature legend" and "I see". "Encyclopedia Quest", "Science World ", "Science and Technology Expo" were cancelled. The intrinsic programs of "Lecture Room", "Exploring • Discovery", "Approach science", and so on have grown into the brands of science and education channel because they have accurate positioning, prominent personality and well-produced. After the revision, CCTV10 further highlight the core status of the brand programs through broadcasting in the evening prime-time and extending the period before and after, to focus on creating "brand program clusters", enlarge brand efficiency and reinforce channel brand basis. The famous programs such as "The Doctor is in", "I love invention" and "Light of science" took the revision as an opportunity, dig their own values in terms of subject and form, strengthen topic planning, quality management and brand promotion efforts for sustainable development of the channel.

2) Local science and education channel

In addition to CCTV10, the local science and education channels have not stopped the pace of reform and innovation. The science and education channels of Anhui and Guizhou revision in 2011; The science and education channels of Beijing and Tianjin in 2012 revision, Chongqing science and education channel revision in 2013. These channels through the revision, adjust the program structure, optimize the program layout and improve the communication effects of the channel. For example, as one of the most influential mainstream media, Beijing science and education channel opened the evening scientific programs, strengthen science and education program and set up law time, scientific time, humanity time, to create a distinctive "science and education" temper and obtain good communication effect.

II. THE ANALYSIS OF SCIENCE COMMUNICATION COMPETENCE ON TV IN CHINA

A. Research Methods

1) Questionnaire survey

The study of science communication competence used the

method of questionnaire survey (Quota sampling). Total 1,480 valid samples were obtained through the network platform. Sample acquisition time is August.2014.

2) Sample Description

About the samples, described as follows:

TABLE3 FAMOUS POPULAR SCIENCE PROGRAMS

Age	Case	Percentage
<=20 (less than or equal to 20)	27	1.8%
21~30 (between 21 and 30)	551	37.2%
31~40	571	38.6%
41~50	277	18.7%
>=50 (equal to or greater than 50)	50	3.4%
missing	4	0.3%
total	1480	100.0%

Gender	Number	Percentage
male	763	51.6%
female	717	48.4%
total	1480	100.0%

B. Data analysis

1) The analysis of own science communication ability on TV

The study examined own science communication ability on TV from three levels. The first is to examine from the communication system level. TV was compared with PC, mobile, newspaper, magazine and broadcast. The second level is to investigate the spread ability of channels. Third is to study the spread of representative science and education programs.

The method is assignment analysis (score: on a scale of 1 to 5)

a. Science communication competence on TV in communication system

With the development of network and mobile technology, the main way of people obtained science information has been transferred from traditional media to "computer network" and "mobile network" ". In the six communication channels, the television is in third place; the computer network is the most popular way to understand science, and secondly, the mobile network.

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TABLE4 THE SITUATION THAT PEOPLE UNDERSTAND SCIENCE KNOWLEDGE THROUGH MEDIA

media	never	little	middle	much	very much	total	weighted average
TV	3.3%	11.2%	37.7%	37.2%	10.5%	100%	3.40
PC	3.0%	4.9%	26.3%	43.0%	22.8%	100%	3.78
Mobile	6.1%	10.3%	30.7%	34.6%	18.2%	100%	3.49
Newspaper	9.5%	29.3%	43.4%	14.0%	3.7%	100%	2.73
Magazine	9.7%	30.9%	43.6%	13.2%	2.6%	100%	2.68
Broadcast	19.7%	35.0%	31.8%	10.7%	2.8%	100%	2.42

TABLE5 THE VIEWING FREQUENCY OF THE SCIENCE AND EDUCATION CHANNEL

	Channel	never	seldom	sometimes	often	always	total	weighted average
1	CCTV10 (science and education channel)	3.3%	11.8%	41.1%	34.4%	9.3%	100%	3.35
2	CCTV9 (documentary channel)	4.1%	10.7%	42.5%	33.6%	9.1%	100%	3.33
3	China Education Television	12.1%	30.1%	39.3%	15.4%	3.2%	100%	2.68
4	Beijing documentary channel	31.1%	32.7%	24.5%	9.0%	2.7%	100%	2.19
5	Beijing science and education channel	30.5%	33.4%	25.1%	8.2%	2.8%	100%	2.19

TABLE6 THE VIEWING FREQUENCY OF THE SCIENCE PROGRAM

	program	never	seldom	sometimes	often	always	total	weighted average
1	Human and Nature	3.4%	10.9%	37.2%	37.2%	11.3%	100%	3.42
2	Exploration·Discovery	3.8%	10.5%	38.6%	36.2%	10.9%	100%	3.40
3	Approaching science	3.3%	11.4%	38.6%	36.4%	10.3%	100%	3.39
4	Animal World	3.1%	13.5%	40.3%	33.4%	9.6%	100%	3.33
5	Discovery Channel	8.8%	15.7%	41.1%	27.0%	7.3%	100%	3.08

b. Science communication competence of channel

From people attention to science and education channels, assignment analysis results show CCTV10 and CCTV9 have the highest attention. The score of CCTV10 is 3.35, CCTV9 is 3.33 Only these two TV stations scored higher than 3 points.

c. Science communication competence of program

Data analysis showed that the famous science programs such as "Human and Nature" and "Exploration · Discovery" have the highest communication competence. "Man and nature" is 3.42 points, ranked first, followed by the "discovery", 3.40 points.

Here is the viewing frequency of the science program.

2) The analysis of science communication credibility on TV

a. Science communication credibility on TV in communication system

Research method is same as above.

Science communication credibility on TV is the highest in the six communication channels from data analysis. It's up 3.69 points.

TABLE7 THE DEGREE OF TRUST FOR SCIENCE INFORMATION FROM DIFFERENT MEDIA

media	never	hardly	middle	some how	completely	total	weighted average
TV	2.0%	6.2%	30.8%	48.6%	12.4%	100%	3.63
Mobile	6.1%	10.3%	30.7%	34.6%	18.2%	100%	3.49
Newspaper	3.2%	11.0%	41.4%	39.6%	4.9%	100%	3.32
PC	1.6%	9.9%	48.9%	35.2%	4.5%	100%	3.31
Broadcast	5.5%	14.3%	44.2%	31.2%	4.8%	100%	3.16
Magazine	3.6%	15.9%	46.8%	30.4%	3.3%	100%	3.14

b. The Comparison of credibility between TV and social media for science communication

Social media is a media of the most rapid development in the last five years. Microblog and wechat have become a huge social impact form of the media and also formed a strong impact to the traditional media. But compared with social media, the relative credibility of TV is still the highest.

By measuring the relative credibility index to compare between TV and social media, the results show that the relative credibility of television is ahead of social media. In social media, the highest is friend circle of wechat, microblog followed.

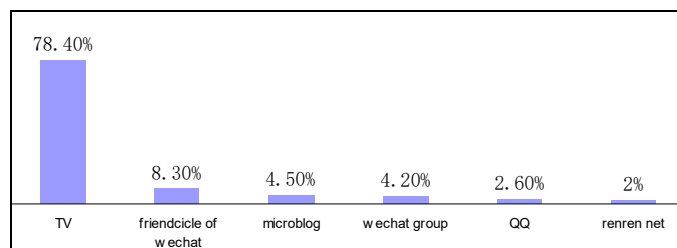


Figure 1. the degree of trust for science information from different media

3) The analysis of science communication influence on TV

a. Television for science communication has a greater influence

Through data analysis, people think that science communication on TV having some impact to own is the highest proportion, accounting for 43.1%; having a greater impact followed, accounting for 36.2%. That is, science communication on TV has a certain influence.

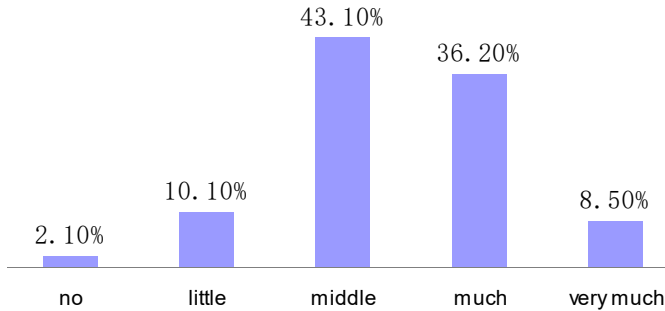


Figure 2. the distribution of science communication influence on TV

b. Retransmission influence of TV program for science communication

After watching the science program on TV, the most common communication act of people is talking about it to family, friends and colleagues. It got 3.16 point. Other acts have not reached a median of 3 points, that is, other acts of communication are not significant.

III. CONCLUSION

Through research and analysis, we can draw some conclusions. Mainly include five points.

Firstly, In the Internet era, compared with other media, television still have the highest credibility, larger communication competence and influence in China. So television is still the important media of science and communication.

Secondly, it can be seen from credibility score that the level of media science communication credibility is in the middle level. Although TV credibility is the highest, there are not much difference between TV and other media.

Thirdly, in China, most of the foreign introduced programs are about professional knowledge of science and technology such as frontier science of space and astronomy,

life science, animal science, military science and so on, and more documentary. According to incomplete statistics, the introduced programs of "Discovery Channel" and "National Geography" are the programs replayed most times. In addition, part of the documentaries from BBC is frequently appear in national and major provincial science and education channels, but has not been introduced with the whole program. The features of these introduced programs are huge investment, shooting difficult, high technology content and long shooting cycle.

The original popular science programs are close to people life, and introduce scientific knowledge in daily life. For examples, family practical science, health and medical knowledge, etc. The original programs replayed most are "The Doctor is in" and "Health & fitness House". The more local stations tend to play healthful type of program. These original programs have the features: the investment is small; shooting is less difficult; level of scientific and technological content is low; audience participation is high; shooting cycle is short; usually the shooting cycle and the broadcast cycle is consistent.

Lastly, it can be seen from the ranking of well-known TV science programs that Chinese is more concerned about the relationship between man and nature.

IV. SUGGESTION

A. Strengthen efforts of science communication on TV

In view of the self-ability of science communication, credibility and influence of TV, we should strengthen efforts of science communication on TV. According to the results of the ninth civil science literacy survey, television remains the primary channel to obtain scientific information. It can increase the intensity of communication through the choice of broadcast time or increasing the length of broadcast and so on.

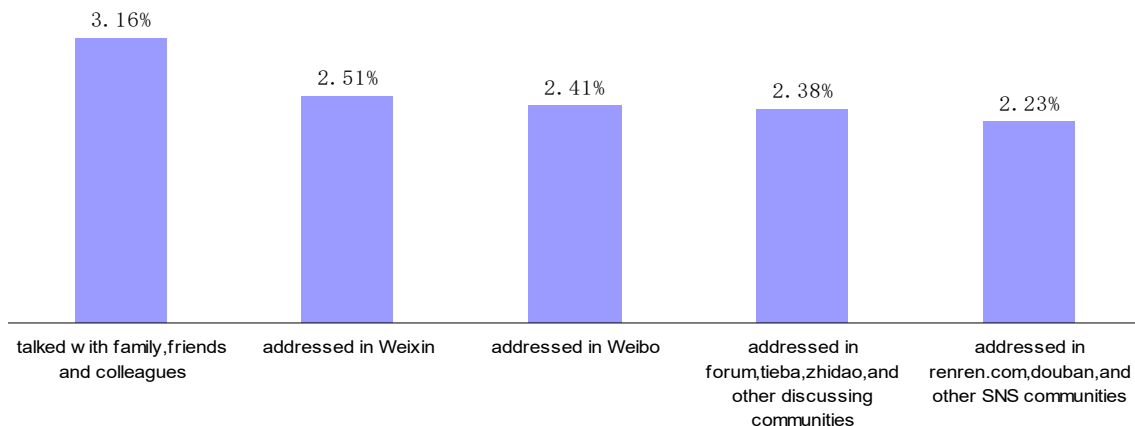


Figure 3. Retransmission influence of TV program for science communication

B. Strengthen content construction of science communication on TV

About content construction, we should pay attention to build the original science programs and create more programs. At the same time, we should increase the kind of program such as "life knowledge" to broadcast.

C. Strengthen the integration of television and other media

Because media convergence is the trend of development, television science programs can be retransmitted widely through other media channels. Therefore, we should make full use of new media communication methods such as wechat, microblog, etc., to strengthen the influence of retransmission on TV.

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