SL-SURVEY
2010.11

The Survey of Public Scientific Literacy,2010

Main Findings of Public Knowledge, Approach,Interest, and Attitude regarding Science & Technology

China Research Institute for Science Popularization

Introduction

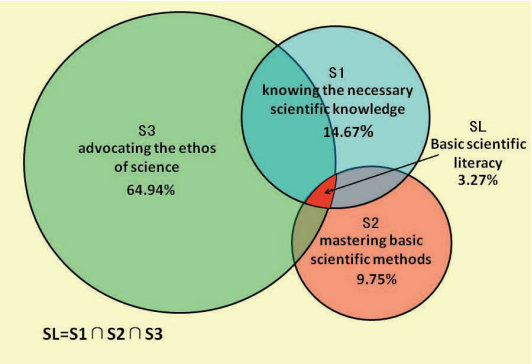
In order to understand the public scientific literacy status and its change pattern comprehensively and systematically, to provide basic data for summarizing, monitoring and evaluating the implementation of the *'Outline of the National Scheme for Scientific Literacy (2006-2010-2020)'*, and to provide evidences for decision- makers in policy making, China Research Institute for Science Popularization carried out the 8th Public Scientific Literacy Survey from November 2009 to May 2010.

The survey was conducted by face-to-face interview in a frame of large-scale sampling covering 31 provinces, autonomous regions, and municipalities as well as Xinjiang Production and Construction Corps in China's mainland. The target population of the survey were Chinese adult citizens aged between 18-69. The design sample size was 69,360, and 68,416 valid responses were eventually received. The 2010 survey contained 3 important correlative components: the status of public scientific knowledge, public channels for S&T information, public engagement in relative activities, and public attitudes towards S&T. The results of the survey indicate that the level of scientific literacy of Chinese citizens has improved significantly during the 'Eleventh Five-Year Plan', and the proportion of citizens who are considered basically scientific-literate has reached to 3.27% in the latest survey. The scientific level of urban workforce and farmers increases comprehensively. Traditional media such as TV and newspaper is still the main channel for the Chinese citizens to access for S&T information. The proportion of citizens who get S&T information through modern media such as internet has significantly increased. The proportion of citizens who use science popularization facilities and participate in science popularization activities has grown. The survey demonstrates Chinese citizens generally hold a positive and rationally supportive attitude towards S&T and they are consistently active to participate in technology-related activities. The main findings are as follows.

The general status of scientific literacy of Chinese citizens

The scientific literacy level of Chinese citizens was quantitatively measured from the following three aspects in this survey: knowing the necessary scientific knowledge; mastering basic scientific methods; advocating the ethos of science. The respondents who pass the thresholds of these three aspects measurement are to be regarded qualified as having basic scientific literacy.(Figure 1)

Figure 1
The status of scientific literacy of Chinese citizens in 2010

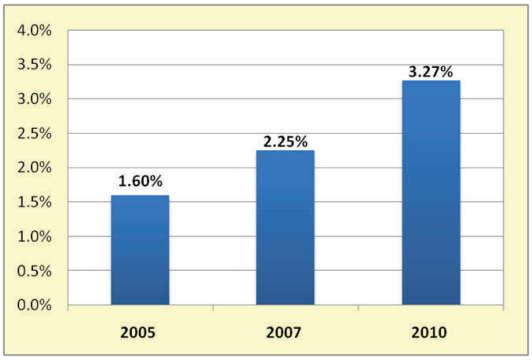


The scientific literacy level of Chinese citizens has been increasing steadily

The proportion of Chinese citizens who are qualified as having basic scientific literacy has reached to 3.27% in 2010 (Figure 1). Of all the respondents, 14.67% are measured as knowing the necessary scientific knowledge, about 9.75% as mastering basic scientific methods, and over 64.94% as advocating the ethos of science.

The analysis shows that the scientific literacy level of Chinese citizens has been increasing steadily during the 'Eleventh Five-Year Plan'. The actual scientific literacy level of Chinese citizens reaches the level of main developed countries in the end of 1980s or the beginning of 1990s, such as Japan (3% in 1991), Canada (4% in 1991) and EU (5% in 1992). The proportion of citizens who have basic scientific literacy has increased 1.67% and 1.02% respectively compared with 1.60% in 2005 and 2.25% in 2007 (Figure. 2), which shows that the civic scientific literacy work in China has achieved remarkable results and the periodical objective in *'Outline of the National Scheme for Scientific Literacy'* has been accomplished.

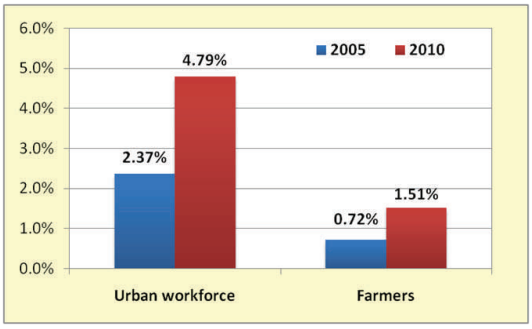
Figure 2
The change of Chinese civic scientific literacy level



The scientific level of urban workforce and farmers promoted significantly

The scientific level of urban workforce and farmers increases comprehensively fast. The proportion of urban laborers who have basic scientific literacy has increased from 2.37% in 2005 to 4.79% in 2010. The proportion of farmers who have basic scientific literacy has increased from 0.72% in 2005 to 1.51% in 2010. The promotion of scientific literacy of urban workforce and farmers playes an important role in the overall improvement of Chinese civic scientific literacy .(Figure 3)

Figure 3
The scientific level of urban workforce and farmers promoted significantly



The scientific literacy level of Chinese citizens develops unevenly

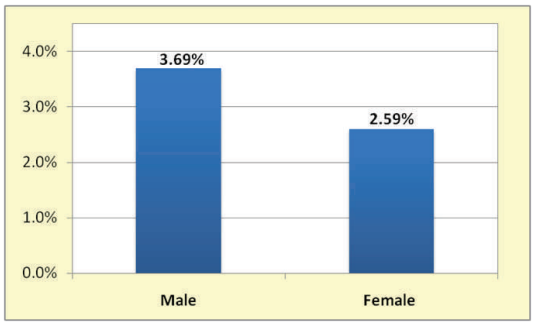
The 2010 survey shows that there are still

different degrees of discrepancy in civic scientific literacy levels among different genders, ages, education levels, urban and rural areas and regions with different level of economic development.

Proportion of citizens of different genders who have basic scientific literacy

The scientific literacy level of citizens of different genders differs obviously. The proportion of scientifically literate male citizens is 3.69%, which is 1.1% higher than that of female citizens. (Figure 4)

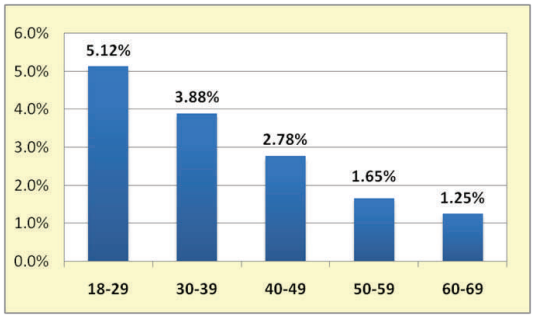
Figure 4
Proportion of citizens of different gender who have basic scientific literacy



Proportion of citizens of different ages who have basic scientific literacy

The scientific literacy level of citizens of different ages has the trend of decreasing while age increases. The proportion of citizens aged 18-29 is 5.12%, which is the highest; 3.88% for 30-39; 2.78% for 40-49; 1.65% for 50-59, 1.25% for 60-69, which is the lowest. (Figure 5)

Figure 5
Proportion of citizens of different ages who have basic scientific literacy



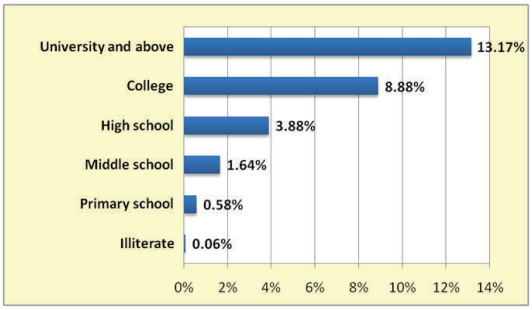
Proportion of citizens of different education levels who have basic scientific literacy

Citizens' scientific literacy level is closely related to their education level. The proportion of citizens who have basic scientific literacy is greater among people with higher education level. The proportion of citizens with bachelor degree or above who have basic scientific literacy is the highest, which is 18.7%; while that with the education level of junior college, high school or technical secondary school and middle school are respectively 8.88%, 3.88% and 1.64%. The proportion of citizens who have basic scientific literacy with the education level below primary school is the lowest, which is less than 1%. (Figure 6)

Proportion of residents in urban and rural areas who have basic scientific literacy

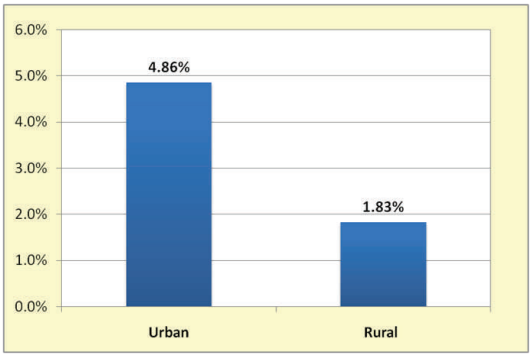
Significant difference exists in scientific literacy level of residents in urban and rural

Figure 6
Proportion of citizens of different education level who have basic scientific literacy



areas. The proportion of urban residents who have basic scientific literacy is 4.86%. The proportion of rural residents who have basic scientific literacy is 1.83%. (Figure 7)

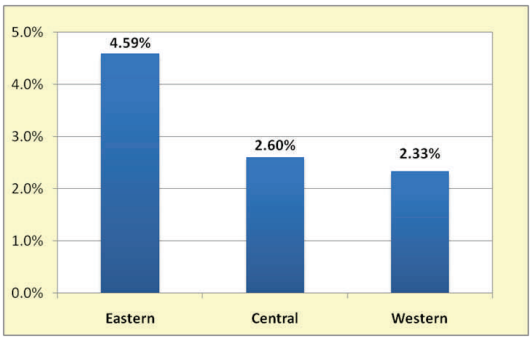
Figure 7
Proportion of residents in urban and rural areas who have basic scientific literacy



Proportion of citizens in different regions who have basic scientific literacy

The scientific literacy level of citizens in regions with different economic levels shows a downward trend from east to west. The proportion of citizens in eastern region who have basic scientific literacy is 4.59%, which is apparently higher than 2.60% in central region and 2.33% in western region. (Figure 8)

Figure 8
Proportion of citizens in different regions who have basic scientific literacy



The situation of Chinese citizens accessing to S&T information and engaging in related activities

TV and Newspaper are still the main channels for Chinese citizens to get S&T information

In accordance with the proportion of utilization of channels for S&T information, the results are arranged in descending order: TV (87.5%), newspaper (59.1%), personal conversation (43.0%), Internet (26.6%), radio (24.6%), and general magazine (12.2%), book (11.9%) and scientific journal (10.5%).

The analysis shows that the proportion of citizens who get S&T information through internet and personal conversation apparently increased. Especially, the proportion of citi-

zens who get S&T information by internet has increased 16 percent comparing with 10.7% in 2007, and that of urban residents is nearly 40%. The proportion of citizens who get S&T information through communicating with people has increased 8 percent comparing to 34.8% in 2007, and that of rural residents is over 50%. (Figure 9)

Public utilization of science popularization facilities

The 2010 survey also includes the investigation on public utilization of science popularization facilities in the past year. The proportions of citizens who have visited all sorts of venues for science popularization are as follows: zoos, aquarium and arboretum (57.9%), Science and Technology Museum (27.0%) and Museum of Natural History (21.9%). The proportions of citizens who visited cultural and art venues are as follows: 50.3% (public library), 26.4% (art gallery or exhibition hall). The proportions of citizens who use the science popularization facilities are as follows: 48.7% (gallery for popular science

Figure 9
Public channels for S&T information in 2010

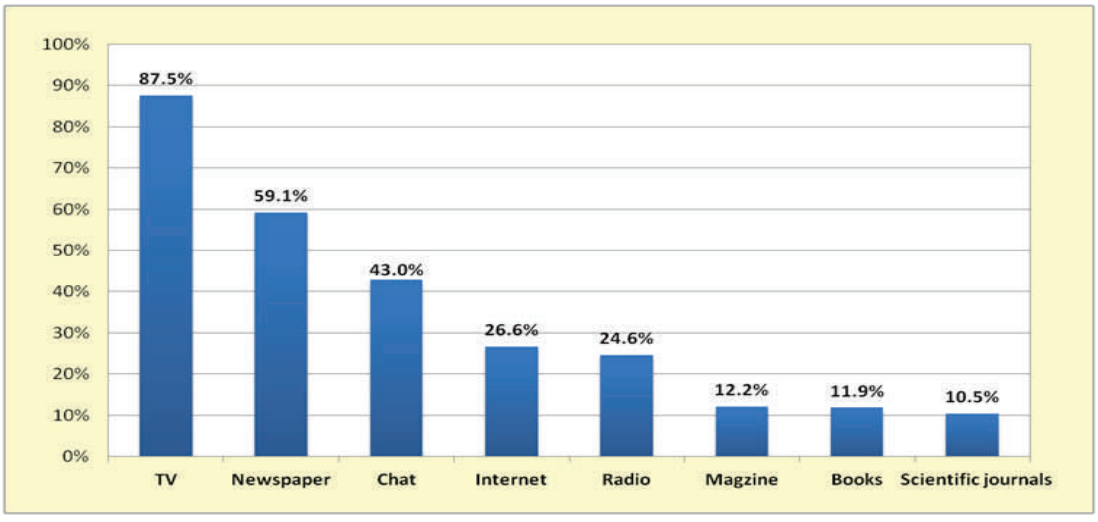
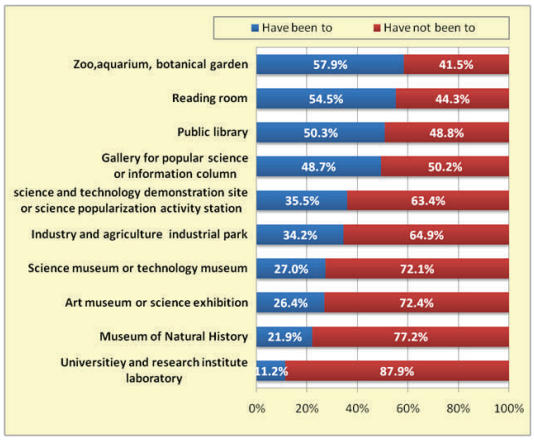


Figure 10
Public utilization of facilities for popular science in 2010



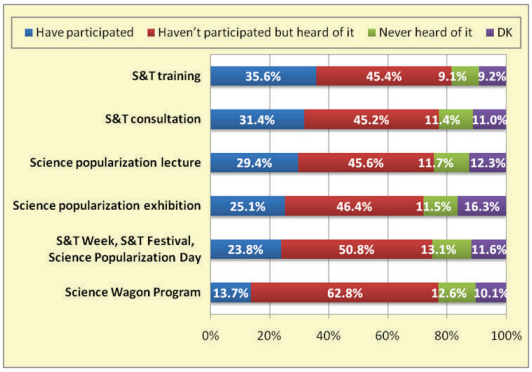
or information column), 54.5% (reading room). The proportions of citizens who visited professional technology venues are as follows: 35.5%(science and technology demonstration site or science popularization activity station), 34.2%(industry and agriculture industrial park), 11.2% (university and research institute laboratory). (Figure 10)

The analysis shows that the proportion of citizens who have visited venues for science popularization because of 'Self interests' has increased. And the proportion of citizens who haven't visited venues for science popularization because they are 'Not in local' has decreased. Take the status of visiting S&T venues like Science and Technology Museum as example, the proportion of citizens who visit these venues because of 'Self interests' is 9.2% in 2010, which increases 2.7 percent comparing with 6.5% in 2007. The proportion of citizens who didn't visit these venues because they are 'Not in local' is 37.6%, which decreases 6.6percent comparing with 44.2% in 2007.

Public participation in science Popularization (SP) activities

The investigation on public participation in science popularization activities in the past year is also included in the 2010 survey. The proportion of citizens who take part in large-scale mass science popularization activities such as science and technology week, science festival and science popularization day is 23.8%. The proportions of citizens who participated in all sorts of regular science popularization activities are 35.6% for science and technology training, 31.4% for science and technology consultation, 29.4% for popular science lectures, 25.1% for science and technology exhibition and 13.7% for SP canvas. Among all the SP activities, the proportion of citizens who 'haven't participated yet heard of' each activity is over 45%. Meanwhile, for SP canvas, though the proportion of participation is low, over 62.8% of respondents say that they've heard of it. (Figure 11)

Figure 11
Public participation in popular science activities in 2010

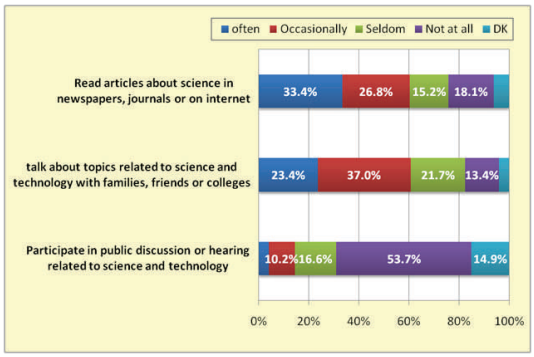


Public engagement in public affairs related to S&T

Improving the ability of citizens to participate in public affairs is a higher level requirement of civic scientific literacy in *'Outline of the National Scheme for Scientific Literacy'*. The survey shows that 60.2% of respondents regularly and occasionally 'Read articles about science in newspapers, journals or on internet'. 60.5% of respondents regularly and occasionally 'talk about topics related to sci-

ence and technology with families, friends or colleges'. About 14.3% of respondents regularly and occasionally 'Participate in public discussion or hearing related to science and technology'. (Figure 12)

Figure 12
Public engagement in public affairs related to S&T in 2010

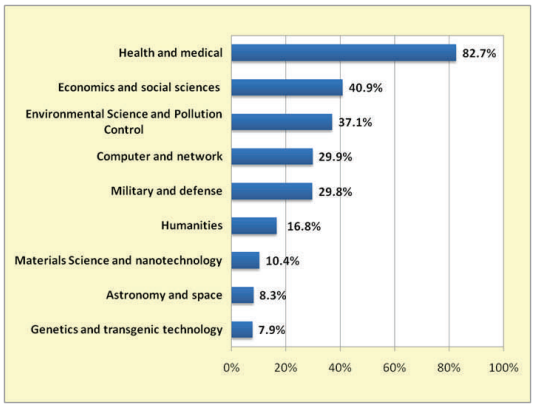


Chinese citizens' attitudes towards S&T

public interest in S&T information

Most of Chinese citizens are interested in S&T-related news topics, such as scientific discoveries (71.7%), medical progress (71.1%), new inventions and technologies (68.2%). Chinese citizens are most interested in medical and health among all the S&T development information, the proportion of which is 82.7%. Other topics in descending order are economics and social development (40.9%); environmental science and pollution control (37.1%); computer and network (29.9%); military and defense (29.8%). (Figure 13)

Figure 13
Public interest in S&T information in 2010

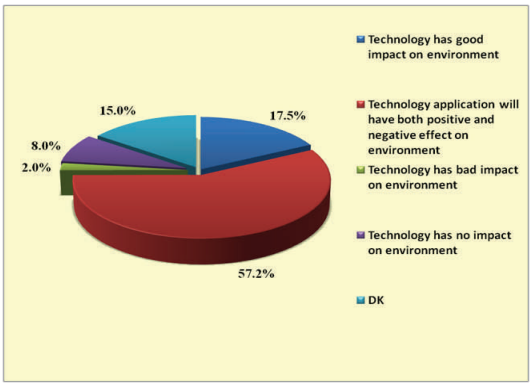


Chinese public expectation for S&T

Most Chinese citizens hold rational and positive attitudes towards S&T

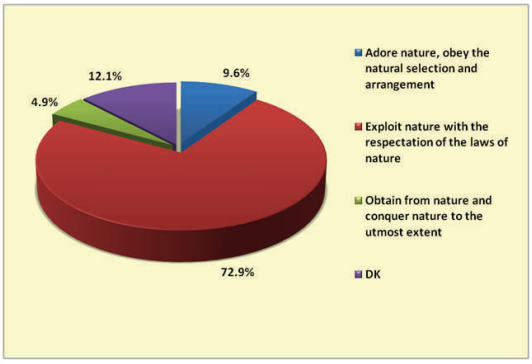
In the general understanding of S&T, 74.8% of Chinese citizens agree that "science and technology are either beneficial or harmful to us and beneficial outweigh harmful." (Figure 14)

Figure 14
Public view of 'impact of technology on the environment'



In the view of the application of technology, more than half respondents (57.2%) believe that 'technology application will have both positive and negative effect on environment'. In regarding to their view of the nature, 72.9% of Chinese citizens agree that "we should develop and utilize nature based on respecting the law of nature".(Figure 15)

Figure 15
Public attitudes towards nature



Chinese citizens support science and technology and have great expectation for it

Regarding the statement that 'even if it brings no immediate benefits, scientific research which adds to knowledge should be supported by government', 77.0% of Chinese respondents agree.

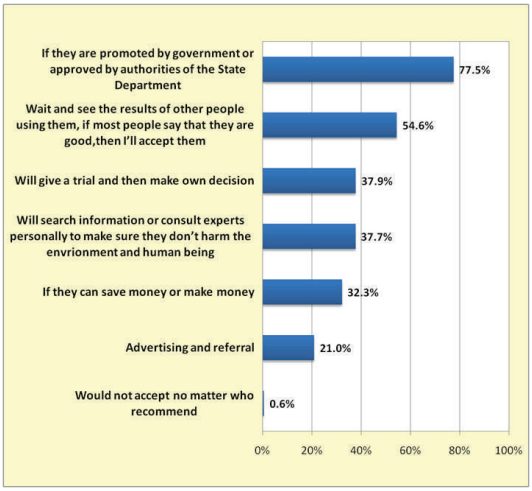
84.5% of Chinese citizens agree that "Thanks to science and technology, there will be more opportunities for future generations". And 77.6% of respondents agree that "In general, scientific and technological development will create more jobs than they will eliminate."

The survey shows that Chinese citizens are in general optimistic about science and technology. 88.7% of respondents agree that 'science and technology make our lives healthier, easier and more comfortable'. 76.9% of respondents totally agree with the statement that 'scientific and technological progress will help cure illnesses such as AIDS, cancer, etc.'

Chinese citizens are willing to participate in public science and technology affairs

73.1% of respondents approve the statement 'Public understanding and support is the foundation to promote S&T development and for building an innovation-oriented country'. Simultaneously, 72.6% of respondents agree that 'government should provide more approaches to the public, such as hearings and other occasions, in order to promote the public to partici-

Figure 16
Chinese Citizens to accept a precondition for new technologies



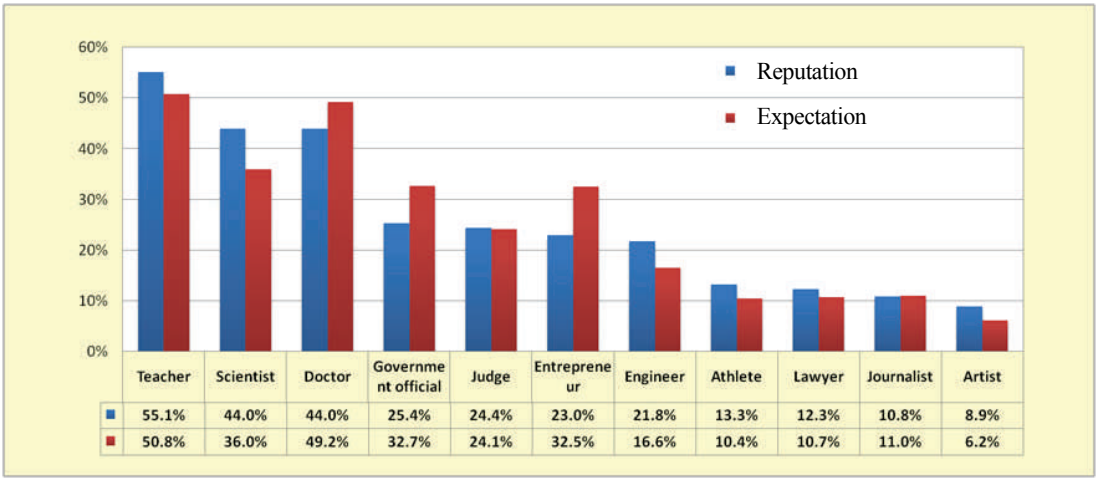
pate in S&T decision-making processes'. 70.97% of Chinese public agree that "Scientists should participate in science communication to get people know more about the new development of science research."

When asked "Which conditions you will accept the new technology, new products or new varieties", 77.53% of Chinese public choose "when it recognized by national departments or promoted by the government"; 37.74% of the respondents choose "after looking for information or asking for the experts to confirm that there is no harm to environments and human"; 37.91% of the respondents choose "they will try it first and then make decision"; and also 54.57% of Chinese public choose "if others say it is good, I will accept it". (Figure 16)

Reputations of S&T related professionals

Among various professions, reputations of science and technology related professionals are more favorable than others in the view of Chinese public. Teacher (55.1%), scientist (44.0%), and doctor (44.0%) rank top three in the occupational prestige, while engineer (21.8%) comes in at seventh. When comes to their expectation for children's occupation, teacher (50.8%), doctor (49.2%), scientist (36.0%) still rank at the top three selections by Chinese citizens, and engineer (16.6%) stays at the 7th. (Figure 17)

Figure 17
Reputation and Expectation of various professions



	Teacher	Scientist	Doctor	Governme nt official	Judge	Entreprene ur	Engineer	Athlete	Lawyer	Journalist	Artist
Reputation	55.1%	44.0%	44.0%	25.4%	24.4%	23.0%	21.8%	13.3%	12.3%	10.8%	8.9%
Expectation	50.8%	36.0%	49.2%	32.7%	24.1%	32.5%	16.6%	10.4%	10.7%	11.0%	6.2%

Technical Specifications

Technical specifications of previous public scientific literacy surveys in China are listed in blew table
Technical specifications of public scientific literacy survey in 2010 are as follows

Sampling method: Stratified 3-stage probability propotionate to size sampling with unequal probabilites. Estimation error: d≤3%

Sample size: Design sample : 69360; Valid responses: 68416

Weighting: Age, Education, Gender,Rural and Urban population, etc.

Duration: November 2009 to May 2010

Target population: 18-year-old to 69-year-old adult citizens

Scope: 31 provinces, autonomous regions and municipalities as well as Xinjiang Production and Construction Corps in China's Mainland

Conductor: China Research Institute for Science Popularization

Technical support: School of Statistics, China Renmin University

Survey Year	1992	1994	1996	2001	2003	2005	2007	2010
Sample Size	5500	5000	6000	8520	8520	8570	10080	69360
Sample Method	PPS			Stratified 4-stage PPS with unequal probabilites			Stratified 3-stage PPS with unequal probabilites	
Reference	The fourth national census of China			House-hold Register	The fifth national census of China & 1% Population Sample Survey			
Weighted	Gender			Age, Education, Gender,Rural and Urban population				
Scope	China's Mainland							
Survey Method	Face-to-face							
Target	18-year-old to 69-year-old adult citizens							
Agency	Ministry of Science and Technology of the People's Republic of China(MOST) And China Association of Science and Technology(CAST)			China Research Institute for Science Popularization (CRISP)				
Approved	National Bureau of Statistics of China							