Public Perspective towards Social Impact of Chang E Lunar Probe Program [4]

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Abstract

During the past decades, assessing the impact of technological project and related engineering has long been paid attention. The objective of this research is to investigate technological project and related engineering's social impact through public perspective. The present article investigated the social impact of China's Chang E Lunar Probe project by using Social Impact Assessment (SIA) methods, resulting from a research study conducted in 2012. SIA is a collective of the systematic methods used to investigate the influence of engineering, project or policy and to present their potential social impacts. A survey from public respondents indicated that public spoke highly of Chang E Probe on the whole. Furthermore, a factor analysis of the perspective of public perspective towards Chang E Lunar Probe project has discovered such impact were mainly assessed in four dimensions by public, these impacts were military impact, political impact, public support and educational impact. From the results obtained so far, it revealed that public perspective towards the political impact of the Chang E Probe varies from each other but unified when they assess Chang E's military impact, meanwhile student's perspective towards the educational impact of Chang E Probe was largely different from other publics.

Key-words: Chang E Lunar Probe Engineering, Social Impact Assessment, Public perspective, China, Research and Development, Military research, Education
JEL codes: I23, O32, O38, P30

[4] The present article is based on the MA thesis of Hou Bowen (Ph.D candidate) and on the presentation made at the ISA World Congress of Sociology held in Yokohama (Japan) on July 2014 at the Session on "Assessing Technologies: Global Patterns of Trust and Distrust" of RC23-Sociology of Science and Technology. The MA thesis has the supervision of Prof. Yin Haijie (professor in Harbin Institute of Technology).

Introduction

With the process of industrialization and urbanization speeding up, people have been living in a society constructed by all kinds of technical projects and related engineering. These projects and engineering influence human life a lot and their impact has been shown mainly in economy, environmental and social aspects. However, technical projects and engineering's impact assessment has long been done mainly in economy and environment territory, while their social impacts have not been given enough attention. If their social impacts cannot be revealed and properly be assessed, human life may be surrounded by many engineering with high economy value but devastating social impacts. Therefore, projects and engineering's social impacts assessment becomes more and more important not only in social research but also in human daily life.

In 1969, the *National Environmental Policy Act* set the regulation that The President shall transmit to the Congress annually beginning July 1, 1970, an Environmental Quality Report, which consists of the environmental, economy and social assessment of city construction, industrial development, resource exploitation and other engineering, project and policy related to our daily life (National Environmental Policy Act, 1969). SIA started to formalize as a normal process after this act's application and its spread around the world, just like Rabel J. Burdge stated that this act is the beginning and origin of social impact assessment (Burdge, 1990: 123-124). In 1986, United Nations Industrial Development Organization and the Industrial Development Centre for Arab States jointly prepared *Manual for Evaluation of Industrial Projects*, introduced 'employment effect', 'distribution effect', 'net foreign-exchange effect' and 'international competitiveness assessment' into project's impact assessment index system, which had improved engineering's social impact assessment a lot (Manual for Evaluation of Industrial Projects, 1986). In 1994, International Association for Impact Assessment published *Guidelines and Principles for Social Impact Assessment*, where detailed concepts, assessment procedure and model were clearly defined (Burdge, 1995: 11-43). In 2003, IAIA published *Principles and Guidelines for Social Impact Assessment in the USA* which had expanded research objects' scope to Projects, Policies, Plans and Programs, known as 4Ps (Frank V, 2003, 5-11).

With the development of SIA policy, SIA practices started to spread especially in the field such as natural resource management, international aid, natural disaster warning and major construction projects (Ana ME., 2012: 34-42). In 1976, Senate and House of Representatives of the United States of America in Congress published *Magnuson-Stevens Fishery Conservation And Management Act*, which pointed that fishery management should consider local historical, economy and social background and tradition(Magnuson-Stevens Fishery Conservation And Management Act, 1976, amended in 2011). In 1984, a research delivered on a thermal power project in Keephills Canada, which focused on local public involvement's huge influence upon engineering's construction (Frideres, 1984: 52-60). In 1993, a research focused on a failed high way construction in Illinois indicated that prediction of responses to impact and

alternative solution are fundamental to engineering construction (Norbert J, 1993: 203-207). In 2000, Department of Agriculture Australian published a SIA report focused on local employment after local forest policy's application (Gippsland Regional Forest Agreement (Rfa) Social Impact Analysis, 2000). In 2012, Department of International Development Britain published a report described the social impact of the international aid construction in Democratic Republic of Congo in order to achieve better goals (Humphreys, Sanchez de la Sierra, van der Windt, 2012).

From 1990's China started to pay attention to SIA, the State Planning Commission authorized Chinese Engineering consulting company published *Guidelines for Feasibility Study on Investment and Project* pointed that SIA is important for engineering construction and policy application (Society guidelines for the evaluation of investment projects/The State Planning Commission Investment Research Institute Ministry of construction standards of social norm on the performance evaluation research group, 1997). In 2002, The State Planning Commission Investment Research Institute and the Ministry of Construction published *Guidelines and Principles for Social Impact Assessment on Investment and Project* in which the concept, content and assess model of SIA was elaborately introduced (Compilation group of investment project feasibility study guide, 2002). In 2004, *Chinese Guidelines and Principles for Social Impact Assessment on Investment and Project* presented a review on the development of SIA implementation in engineering and projects (China international engineering consulting company, 2004). In 2007, the State Council published *Project Application Report General Text* which required that a comprehensive report concluding SIA was initial for project's funding application(Circular of the national development and Reform Commission on the issuance of the project application report general text, 2007). In 2011, Ministry of Housing and Urban Rural Development published *Guidelines For Assessment on Major Public Building Project* and *Guidelines for social Assessment on Municipal Utilities project* which offered a comprehensive social impact assessment applied to different construction stages which consists of preparation, construction, operation and monitoring (Quota of Ministry of housing and urban rural construction standards, 2011).

At the same time, various studies in China had introduced the origin and development of SIA into Chinese project evaluation study (Tang Yong, 2007, 72-77; Yang Huajun, 2007, 588-593; Xiang Qing, 1997: 24-27). Meanwhile many studies had been performed on various engineering construction and operation's social impact assessment (Zhao Wenlong, 2007: 25-29; Li Xinan, 2003: 24-27; Zhang Honghon, 2000: 57-59; Xu Zhil, 2006: 371-375). In addition, some researches focused on SIA index's construction and contributed a lot (Jia Guangshe, 2010, 148-152; Li Qiang, 2010: 106-112). At the same time, there were many attention had been paid mainly in Aerospace industry risk management, which mainly focused on project itself (Huang F., 1998: 38-42). Meng et al. carried a pilot study on aerospace project risk management in 2012 (Meng et al. 2012: 60-65). Yang worked on aerospace project management index's construction (Yang Cx., 2003: 17-19). However, there was nearly no

research focused on aerospace's social impact. Even though, there is some research that have investigated its social impact, which have been analyzed from the point of view of experts, and not from the public perspective. It is probably for the reason that its influence cannot be assessed in a short time, and there is no effective way of assessing Aerospace engineering's social impact. Furthermore, social researcher could not find a effective way through which they could assess technical project and related engineering's social impact. Nevertheless, this thesis tried to make a pilot study on Chang E's (a Chinese aerospace project)[5] social impact from public perspective.

Methodology

Social impact assessment is a collective of the systematic methods on assessing project or engineering's social impact. There are ten steps logical and sequential but often overlooked in project or technological related engineering social impacts assessment practices. In this study, the main research content are focused in the first five steps (Burdge, et al., 2003: 244), as figure 1 showed:

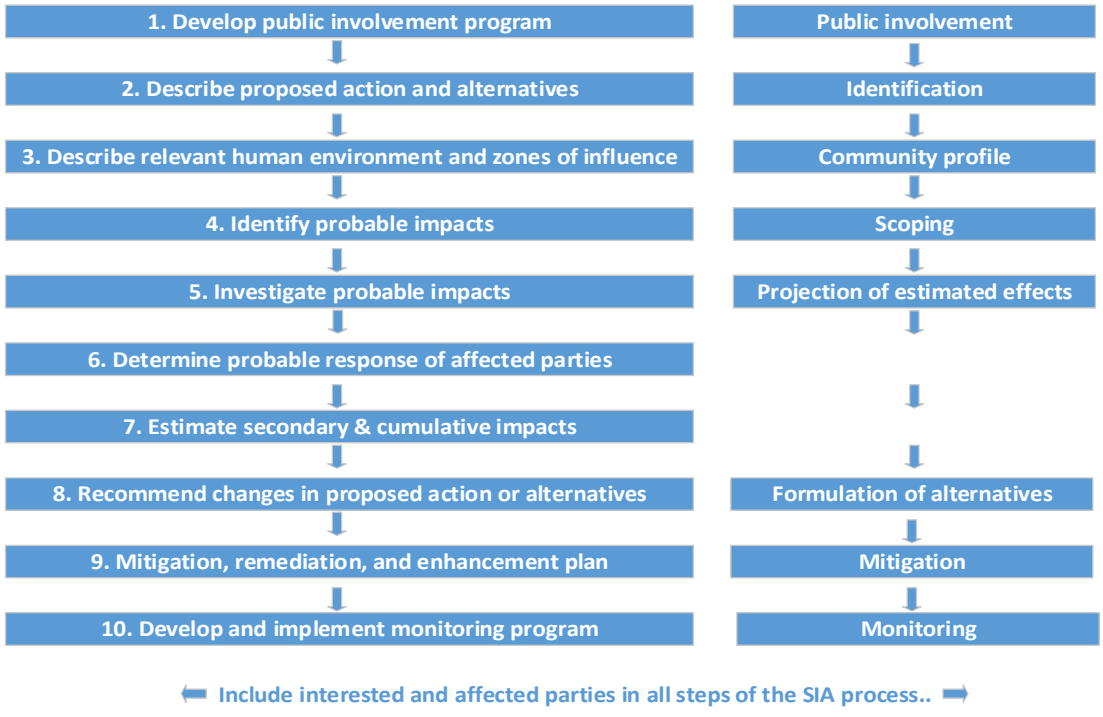


Fig. 1 Steps in the social impact assessment process

[5] Chang E Lunar Probe is designed to work in three stages which are 'flying around, landing and returning.' At the first stage, Chang E will fly around moon. At the second stage, Chang E will land on moon. At the third stage, Chang E will return from moon and back to earth.

As Burdge et al. Defined, public involvement means that those who has an interest in the proposal but may not live in proximity (Burdge, et al., 2003, 243), so respondents who are willing to fill the questionnaire can be defined as the people participated in the public involvement program. Identification means to make a clear view of the project. In this study, a general information about Chang E Probe project was introduced. At the same time, there are questions were designed to clarify how much did Chang E Probe II cost, which will offer a general information on this project. For the reason that Chang E Probe is a technological related project, there is no direct related influence on geographic zones. In order to clarify the relevant environment and zones, there are six social territory of impacts are going to be analyzed in this study. These impacts are technological, political, economy, educational, military, patriotic impacts. After elaborately describing relevant environment and zones of influence, it has to identify probable impacts and investigate probable impacts. As Burdge, R.J. etc. stated that there are five ways of getting information or data and one of them is *Field Research*, including informant interviews, hearings, group meetings and, if funds are available, surveys of the general population (Burdge et al., 2003: 246). In the next passage, a questionnaire using in research survey was constructed.

Instruments

Based on heuristic research on Chang E Lunar Probe, a questionnaire consists of nineteen indexes in seven dimensions which are economy, political, technological, educational, military, patriotic and public support was constructed. Items are rated on a 5-point Likert-type scale indicating the degree of the perspective towards social impact of the program given by respondents (1 = there is a badly negative impact, 2 = there is a relatively negative impact, 3 = neither negative nor positive, 4=there is a relatively positive impact, 5=there is a strongly positive impact).

Procedure

A survey was delivered to acquire public perspective towards Chang E Probe's social impacts by using questionnaire methods. The survey was conducted in two stages. At the first stage, in order to gain multiple public perspectives towards Chang E Lunar Probe Engineering, from April 26th 2013 to May 15th 2013, the survey was conducted in three different cities whose population are ranged from 22,767 and 445,671 to 7569,000. At this stage, taking research funding into account, Accidental Sampling was used as sampling methods which has a feature of randomness. 525 questionnaires were sent, however 325 were valid and used in analyses. At the second stages, in order to reduce regional influence on public perspective, from May 17th 2013 to Jun 9th 2013, the survey was

delivered online by using Questionnaire Star [6]. There were 325 valid samples used in analyses, which came from 16 provinces, 4 central districts in China and 8 foreign cities out of China.

Sample

About 46.6 percent (n=297) of the sample were male, at the same time 53.4 percent(n=340) were female. Respondents were ranged from 16 years to 72 years. Education profile is listed below as table 1.

Table 1 Education Distribution

Education background	Frequency	Percentage
Secondary School And Below	107	16.8
High School	118	18.5
Junior College	45	7.1
Bachelor Degree	194	30.5
MA or PhD	173	27.2
Total	637	100.0

Occupation profile is listed below as table 2.

Table 2 Occupation Distribution

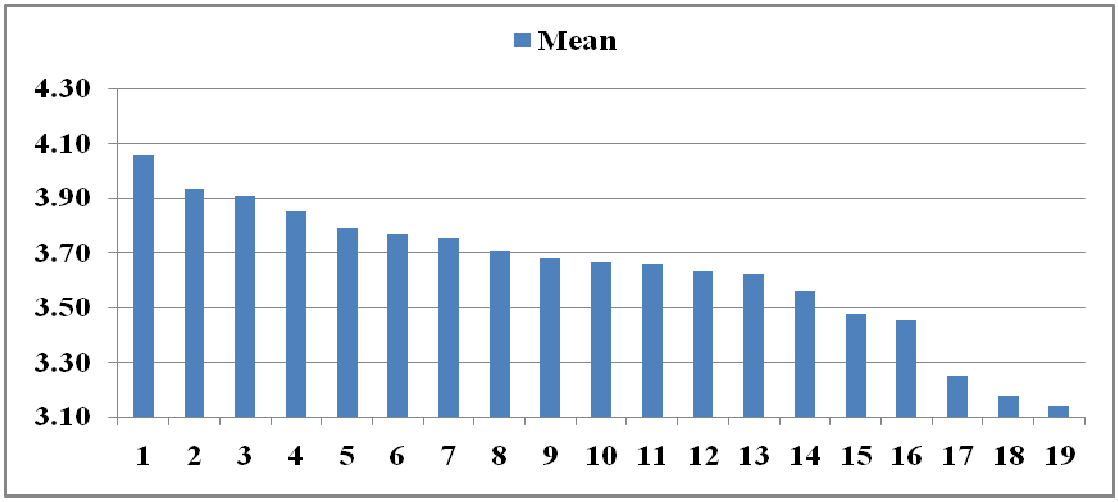
Occupation	Frequency	Percentage
Chief Of State Administration, Enterprises And Institutions	9	1.4
Professional And Technical Personnel	43	6.8
Clerk And Related Personnel	154	24.2
Commercial And Service Personnel	19	3
Farming, Forestry,Husbandry And Fishing Personnel	81	12.7
Production, Transport And Equipment Operator	33	5.2
Students And Other	298	46.8
Total	637	100

[6] See www.sojump.com, China

Results

In order to present the overview of public perspective towards the social impacts of Chang E Lunar Probe Program, a figure calculating all respondents mean value by every question has been given as follow.

Figure 2 - Overview of Public Perspective towards Chang E Probe's Social Impacts



1 perspective towards developing the project
2 Influence on Chinese high-tech development
3 Influence on Chinese international technological competitiveness
4 Influence on national self-confidence
5 Influence on Chinese political status in the world
6 Influence on Chinese military equipment
7 Influence on national pride
8 Influence on Chinese military deterrence
9 Impact on Chinese military international influence
10 Influence on the patriotic enthusiasm
11 Influence on administration in China
12 Influence on Chinese homeland security
13 Influence on juvenile's view of science and technology
14 Influence on Chinese the international economy
15 Influence on juvenile's devotion to science
16 Perspective towards the amount of investment on the project
17 Influence on Chinese the national economy
18 Influence on the credibility of the government
19 Influence on public devotion to Aerospace Engineering

Every question's Median is 3, however learned from fig.2, their mean are all above 3.1, furthermore the highest mean score in fig. 1 reaches 4.05. In addition, the lowest mean score is 3.14, which is higher than Median. In conclusion, the public perspective towards the social impact of Chang E Lunar Probe Program is positive on the whole, subsequently, public perspective could be analyzed in seven dimensions as followed.

Table 3 - Public Perception towards Chang E Probe's Social Impacts Statistics

Social Impact	Indicators	Accumulative Percentage One to two points	Four to five points
Public Perspective Of Support	1 Perspective Towards Developing The Project	5.5%	78.5%
	16 Perspective Towards The Amount Of Investment On The Project	10.7%	47.2%
Technological Impact	2 Influence On China's High-Tech Development	6.3%	72.1%
	3 Influence On China's International Technological Competitiveness	6.3%	70%
Patriotic Impact	4 Influence On National Self-Confidence	9.3%	65.6%
	7 Influence On National Pride	10.8%	61.6%
	10 Influence On The Patriotic Enthusiasm	12.1%	58.4%
	19 Influence On Public Devotion To Aerospace Engineering	25.5%	41%
Political Impact	5 Influence On China's Political Status In The World	9.9%	64.5%
	11 Influence On Administration In China	13.8%	60%
	18 Influence On The Credibility Of The Government	10%	59.4%
Military Impact	6 Influence On China's Military Equipment	9.1%	62.9%
	8 Influence On China's Military Deterrence	11.9%	62.3%
	9 Impact On China's Military International Influence	10%	59.5%
	12 Influence On China's Homeland Security	12.7%	58.9%
Educational Impact	13 Influence On Juvenile View Of Science And Technology	11.5%	57.3%
	15 Influence On Juvenile'S Devotion To Science	15.5%	49.2%
Economy Impact	17 Influence On China's The National Economy	18.9%	36.7%
	14 Influence On China's The International Economy	13.2%	54.2%

The mean of respondents answer on 'perspective towards developing lunar probe' was 4.05 in the first place shown fig 1. Choosing on 1 to 2 points the respondents were 5.5 percent on the total, however choosing 4 to 5 points respondents reached 78.5 percent as shown in table 3, which shows that public was in support of developing lunar probe project.

The mean of respondents answer on 'Influence on Chinese high-tech development' and 'Influence on Chinese international technological competitiveness' were in the second and third place as shown in fig 1. Choosing 1 to 2 points' respondents were 6.3 percent on these two items as shown in table 3, however choosing 4 to 5 points' respondents reached 72.1 percent and 70 percent, which shows that public considers lunar probe project promote science and technology a lot.

The distribution of respondent's answer on 'Influence on national self-confidence' , 'Influence on national pride', 'Influence on public devotion to Aerospace Engineering' and 'Influence on the patriotic enthusiasm' were shown in table 3. Choosing 1 to 2 points' respondents were 9.3 percent, 10.8 percent, 12.1 percent and 25.5 percent on these four items, however choosing 4 to 5 points' respondents reached 65.6 percent, 61.6 percent, 58.4 percent and 41 percent as shown in table 3, which shows that public considers lunar probe project enhance the patriotic enthusiasm.

The distribution of respondent's answer on 'Influence on Chinese political status in the world', 'Influence on administration in China.' and 'Influence on the credibility of the government' were shown in table 3. Choosing 1 to 2 points' respondents were 9.9 percent, 13.8 percent and 10 percent on these three items, however choosing 4 to 5 points' respondents reached 64.5 percent, 60 percent and 59.4 percent as shown in table 3, which shows that public considers lunar probe project's political impact was prominent.

The distribution of respondent's answer on 'Influence on Chinese military equipment', 'Influence on Chinese military deterrence', 'Impact on Chinese military international influence' and 'Influence on Chinese homeland security' were shown in table 3. Choosing 1 to 2 points' respondents were 9.1 percent, 11.9 percent, 10 percent and 12.7 percent on these four items, however choosing 4 to 5 points' respondents reached 62.9 percent, 62.3 percent, 59.5 percent and 58.9 percent as shown in table 3, which shows that public considers lunar probe project's military impact can not be ignored.

The distribution of respondents answer on 'Influence on juvenile view of science and technology' and 'Influence on juvenile's devotion to science' are shown in table 3. Choosing 1 to 2 points respondents were 11.5 percent and 15.5 percent on these four items, however choosing 4 to 5 points' respondents reached 57.3 percent and 49.2 percent as shown in table 3, which shows that public considers lunar probe project's educational impact cannot be neglected.

The distribution of respondent's answer on 'Influence on Chinese the national economy.' and 'Influence on Chinese the international economy.' were shown in table 3. Choosing 1 to 2 points' respondents were 18.9 percent and 13.2 percent on these four items, however choosing 4 to 5 points' respondents reached 36.7 percent and 54.2 percent as shown in table 3, which shows that public considers lunar probe project's educational impact is not too obvious.

Factor Analysis of Chang E Lunar Probe Social Impacts Based on Public perspective

In order to present public perspective towards Chang E lunar probe's social impacts clearly, A Principal Components Analysis with Varimax rotation was undertaken. The Kaiser-Meyer -Olkin measure of sampling adequacy was 0.939, the Bartlett test was also found to be significant ($p < 0.0001$), which means these nineteen items is highly appropriate for factor analysis. Four factors met the Kaiser retention criterion of eigenvalues greater than 1.00. The 19 items yielded 4 factors account for 63.778% of the variance as shown in table 4.

Table 4 Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	% of Cumulative
1	8.539	44.941	44.941
2	1.518	7.992	52.933
3	1.112	5.854	58.786
4	1.020	5.371	64.157

As shown in table 5, Factor 1 (F1), military impact, mainly (above 70 percent) includes four items' content that reflects public perspective towards Chang E Lunar Probe's military influence. Factor 2(F2), political impact, mainly (above 70 percent) includes two items' content that reflect public perspective towards Chang E Lunar Probe's political influence. Factor 3 (F3), educational impact, mainly (above 70 percent) includes two items' content that reflect public perspective towards Chang E Lunar Probe's educational influence. Factor 4(F4), influence on public support, mainly (above 60 percent) includes two items' content that reflect public perspective towards Chang E Lunar Probe's development.

Table 5 Rotated Component Matrix

	Component			
	F1	F2	F3	F4
Influence On Chinese Economy In The World	0.310	0.642	0.135	0.260
Influence On Administration In China	0.236	0.760	0.075	0.126
Influence On National Self-Confidence	0.344	0.509	0.303	0.251
Influence On Chinese Political Status In The World	0.492	0.460	0.257	0.207
Influence On Juvenile'S View Of Science And Technology	0.236	0.230	0.807	0.104
Influence On Juvenile'S Devotion To Science	0.226	0.191	0.845	0.037
Influence On Chinese High-Tech Development	0.564	0.182	0.397	0.203
Influence On National Self-Confidence	0.636	0.195	0.255	0.325
Influence On Chinese Military Equipment	0.784	0.202	0.148	0.163
Influence On Chinese Military Deterrence	0.843	0.185	0.103	0.131
Impact On Chinese Military International Influence	0.801	0.218	0.142	0.023
Influence On Chinese Homeland Security	0.741	0.236	0.183	0.069
Perspective Towards Developing The Lunar Probe Project	0.337	0.277	0.184	0.628
Influence On Public Devotion To Science	0.136	0.330	0.496	0.408
Influence On The Credibility Of The Government	0.128	0.796	0.179	0.052
Influence On Patriotism	0.314	0.501	0.435	0.156
Perspective Towards The Amount National Investment On The Project	0.052	0.074	-0.011	0.826
Influence On National Pride	0.253	0.336	0.371	0.559
Influence On Chinese Economy	0.178	0.625	0.330	0.166

a. Rotation converged in 6 iterations.

Comparison of Different Respondent's perspective towards Chang E Probe's Social Impact

Difference between gender towards political impact and public support factors

An independent t-test was done to determine differences between gender and the identified factors. Independent t-test can be done on the premise of that the distribution of gender on the four factors have equal variance, so a Levene test had been done, results are shown in table 6. The F value of military impact factor, political impact factor and educational impact factor are 1.898, 0.621 and 2.206, the sig. value are all more than 0.05, which means that these three factor could be analyzed by independent t-test. However, the value F of the public support factor and sex is 7.326 and sig. value is 0.007 far less than 0.05, which means that public support should be analyzed by non parametric test.

Table 6 Levene's Test for Equality of Variances

Factor	F	Sig
Military impact	1.898	0.169
Political impact	0.621	0.431
Educational impact	2.206	0.138
Public support	7.326	0.007

Table 7 Independent T-Test

			t-test for Equality of Means		
Factor	Sex	Mean	t	Mean Difference	Sig. (2-tailed)
Military Impact	male	-0.074	-1.738	-0.138	0.083
	female	0.064			
Political Impact	male	-0.155	-3.694	-0.291	0.000
	female	0.135			
Educational Impact	Male	-0.019	-0.440	-0.035	0.660
	female	0.016			

The results of independent t-test are shown in table 7, the t value between sex and military impact factor and educational impact value factor are -1.738 and -0.44, sig. value are 0.083 and 0.66, which means that there was no difference in male and female's perspective towards Chang E probe's military and educational impact. The t value between sex and political impact value factor are -3.936, sig. value is 0.000, which means that male and female respondent's perspective towards Chang E probe's political impact were different. At the same time, the mean of male respondent's perspective is -0.1551 which is lower than female respondent's perspective mean (0.135), which means that female respondents were more positive than male respondents when they assessed Chang E probe's political impact.

As shown in table 6, for the reason that sex and public support factor does not meet equality of variances, so non-parametric tests method was used to analyze the difference between different sex of respondent's view on public support factor. The Z value between sex and public support is -1.967 and sig. value is 0.049 less than 0.05, meanwhile, the mean of male's support is 0.0647 which is higher than female's perspective mean(-0.0565), which means that male respondents were more positive than female respondents when they were asked whether they support Chang E probe public or not.

A weak positive correlation between age and political impact, age and educational impact

A Pearson was done to determine differences between the respondents varies from 16 to 72 and identified factors, results are shown in table 8. The Pearson value between age and military impact factor and public support factor are 0.017、-0.02, sig. value are 0.665、0.622, which means that there was no difference in respondent's of different age perspective towards Chang E probe's military impact and public support. While the Pearson value between age and political impact factor, age and educational impact factor are 0.129、0.118, sig. value are 0.001、0.003 far less than 0.01, which means that political and educational impact had a weak positive correlation with age.

Table 8 Correlate Analysis

		Military impact	Political impact	Educational impact	Public support
Age	Pearson Correlation	0.017	0.129**	0.118**	-0.020
	Pearson Correlation	0.665	0.001	0.003	0.622

** Correlation is significant at the 0.01 level (2-tailed).

Level of education influences how respondents evaluate political impact

An one-way ANOVA was done to investigate whether there are differences between respondents with different level of education when they assess Chang E Probe's social impact. An one-way ANOVA can be done on the premise of that the distribution of sex on the four factors have equal variance, so a Levene test has been done, results are shown in table 9. The F value of these four impact factor are 1.08、1.386、1.362 and 1.293, the sig. value are all more than 0.05, which means that these four factors could be analyzed by means of one-way ANOVA.

Table 9 Levene's Test for Equality of Variances

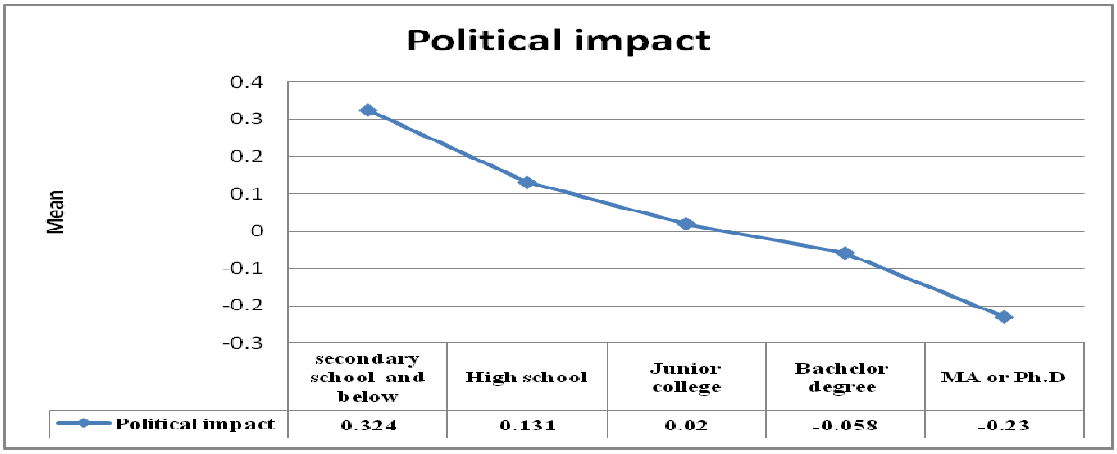
Factor	F	Sig.
Military impact	1.080	0.365
Political impact	1.386	0.237
Educational impact	1.362	0.246
Public support	1.293	0.271

The results of one-way ANOVA are shown in table 10, the F value between other three factors are 0.36、2.336 and 1.747, Sig. value are 0.854、0.54 and 0.138 all more than 0.05, which means that Level of Education did not influence how respondents evaluate Chang E Probe's military impact, educational impact and public support. However the F value between level of education and political factor is 5.929, sig. value is 0.000, which means that Level of Education influenced how respondents evaluate political impact. Differences are described in fig.3, in which respondents with secondary school and below degree gave the most positive comment on political impact, while the respondents with MA or PhD degree showed the most negative perspective to it.

Table 10 - One -way ANOWA

Factor	F	Sig.
Military impact	0.360	0.854
Political impact	5.929	0.000
Educational impact	2.336	0.054
Public support	1.747	0.138

Fig. 3 - Political Impact Assessed by Respondents with Different Level of Education



Occupational influences how respondents evaluate political and educational impact

An one-way ANOVA was done to investigate differences between respondents with various level of education and identified impact factors. An one-way ANOVA can be done on the premise of that the distribution of sex on the four factors have equal variance, so a Levene test has been done, results are shown in table 11. The F value of these four impact factor are 0.154, 1.128, 1.956 and 0.846, the sig. value are all more than 0.05, which means that these four factor could can be analyzed by means of one-way ANOVA.

Table 11 - Levene's Test for Equality of Variances

Factor	F	Sig.
Military impact	0.154	0.988
Political impact	1.128	0.344
Educational impact	1.956	0.070
Public support	0.846	0.534

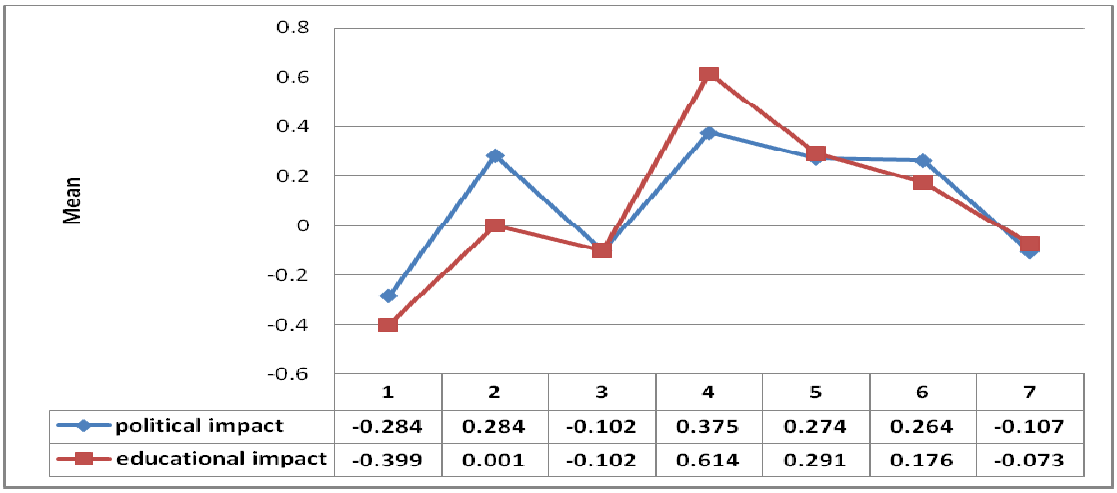
The results of one-way ANOVA are shown in table 12, the F value between occupation and military and public support factors are 0.133 and 1.174, Sig. value are 0.992 and 0.318 all more than 0.05, which means that occupation did not influence how respondents evaluate Chang E Probe's military impact and public support.

However the F value between occupation and political and education factors are 3.475 and 3.355, sig. value are 0.002 and 0.003, which means that occupation influenced how respondents evaluate political and educational impact, detailed difference is shown in Fig.4, in which respondents who are commercial and service personnel showed the most positive perspective.

Table 12 - One-way ANOVA

	F	Sig.
Military impact	0.133	0.992
Political impact	3.475	0.002
Educational impact	3.355	0.003
Public support	1.174	0.318

Fig. 4 - Political and Educational Impacts Assessed by Respondents with Different Occupation



1 chief of state administration, enterprises and institutions
2 professional and technical personnel
3 clerk and related personnel
4 commercial and service personnel
5 farming, forestry, husbandry and fishing personnel
6 production, transport and equipment operator
7 students and others

Conclusions

Firstly, public shows positive perspective towards Chang E Probe's social impacts on the whole. Learned From Fig.2, every question's Mean is higher than Median. At the same time, 78.5% respondents chose to support Chang E Probe. Meanwhile, learned from Table 3, public tended to hold the view that Chang E Probe vigorously promotes scientific and technological development, and offered a positive influence on military and political impact, bore the social concern and public expectations at the same time.

Secondly, this pilot study designed questionnaire consists of 19 indexes to assess its social impacts through public perspective. In order to test whether this questionnaire was valid, a Factor analysis was done. The results of Factor analysis showed that respondents evaluated Chang E Probe's social impacts mainly in four dimensions which were military impact, political impact, educational impact and public support. These four factors in accord with the four impacts in indexes system, which accounts for this pilot study's indexes are effective in analyzing how public evaluates Chang E's social influence.

Thirdly, respondents with different occupation, level of education, sex and age evaluated Chang E Probe's political impact completely different, which proved that its political impact was the most controversial social impact in this assessment. However, respondents with different occupation, level of education, sex and age all positively agreed that military impact was the main influence of Chang E Probe. So whether Change E Probe project has a political impact needs to be investigated in a further step. If Chang E Probe had political impact, it has to be explained why public evaluated it separately. Military impact also has to be analyzed in a more detailed way to reveal why it can be perceptive strongly by public.

Fourthly, student's evaluation on Chang E Probe's educational impact differs from other public. As shown in Table 13, respondents chose 4 to 5 points' in distribution of respondent's answer on 'Influence on juvenile's view of science and technology.' and 'Influence on juvenile's devotion to science.' reached 57.3 percent and 49.2 percent, which shows that public considered Chang E Probe project's educational impact cannot be neglected.

However, as shown in Fig. 4, respondents with another occupation evaluated differently the Chang E's educational impact, students gave the lowest comment on it. In addition, the results offered by an independent t-test (shown in table 13) show that the t value between students and other respondents is 2.238, sig. value 0.017 less than 0.05, which means that these two groups of respondents had different perspective towards evaluating its educational impact. The mean of student's is -1.714 which is lower than other respondent's mean(0.052), which means that student respondents were more negative than other respondents when they were asked whether Chang E probe's has a educational impact or promoted juvenile's interest in science and technology.

Table 13 - Independent T-test

Equality of Variances				T-test		LEVENE test	
Factor	Category	Mean	t	Mean difference	Sig.(2-tailed)	F	Sig
Educational	Students	-1.714					
	Others	0.052	2.388	0.223	0.017	1.27	0.265

At last, Chang E Probe project is a non-geographic engineering which influences public daily life in a indirect way. As a result, social scientists and public cannot evaluate its social impacts based on daily life experiences. This situation leads to difficulties in assessing its social impacts. However, Chang E Probe is a technological related engineering which can influences human life by the spread of certain technology. Such as weather forecasting changes public life obviously, however, weather forecasting technology was originally pushed forward by related satellite engineering. Subsequently, in the next stage of assessing technological related engineering's social impact, combining of engineering, related technology and human life should be taken into consideration in the research instead of assessing separately.

In addition, the foundation of assessing the social impact of technological related engineering should follow the principle that related public could offer their own evaluation on projects based on their own life experiences. Only when social researcher analyzes certain related engineering in the context of human daily life, engineering's social impact could be understood more clearly and profoundly.

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