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Advancement of Science and Its Social Impacts on Mankind: Preliminary Perception among Malaysians

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Abstract
Science plays an important role in human civilisation. The development of sciences today brings positive as well as negative effects to mankind, particularly to environmental issues. This paper presents a study on the perception of people towards assumption that science is the prime factor for environmental problem. A total of 642 respondents from the age of 20 to 55, coming from all over Malaysia, from different group of ethnics and religions participated in this study. The respondents, were given questionnaire, and the raw data was analysed using the SPSS to obtain the mean response, the percentages, and the difference of mean were tested using the t-test and one-way ANOVA. The results are somehow show a good mix of perceptions on the nature of science which involve its positive as well as negative side of effects on environment.
Keywords*: science, environment, human perception, Malaysia.*

Introduction

Science plays a great role in human civilisation since it started to be developed thousands of years ago (Fara, 2009). The achievement of science since the last 400 years (Atkins, & Black, 2003) is immensely beneficial for human being. Science has been enabling human being to exploit the resources to be used by human being. However the problem which faced human being today is to gauge the positive and the negative aspect of science, particularly related to environmental issues. This study is attempted to understand the respondents' awareness on the positive and the negative aspect of science to humankind and the subjects are taken among Malaysians as among one of the third world countries that are the main users of science today.

Literature Review

Since scientific method was developed by Ibn al-Haytham (Steffen, 2007) and later brought to the western world through knowledge transfer, and it was later developed further by Francis Bacon and Galileo (Eder, 2002), science continued to enlighten and benefit humanity at large. Science helps human being to understand the world better than before, and sparks on the innovations of technologies for human being to live a better life, releasing them from the shackles of superstition and fear towards the life full of enlightenment. Francis Bacon and his

peers predicted that science would produce practical benefits by making the society, the masters of the nature (Rao, 1995). The role of science in solving the global problems is commonly recognisable all over the world today (Gvishiani, 2013).

From the time of Bacon, the goal of science has been on knowledge that can be used to dominate and control nature, and technology that are used predominantly for purposes that are profoundly ecological (Capra, 1982). Since then, science continue to progress and develop benefiting human being, and as science progressed and developed further, experts in various field began to realize the possibilities of science as the agent of destruction of human society and the environment. One of the biggest damaged done by science was the destruction of the Japanese towns Hiroshima and Nagasaki, where more than 80,000 people were killed instantaneously (Swatosh, 1998) through the atomic bombs which were originally developed by scientists, among whom was Julius Robert Oppenheimer (Kelly, 2006) and others. Other weapons such as the pilotless drones, the chemical weapons, as well as biological weapons are all developed by the scientist and are used for warfare with the aim of subjugating others.

As time passed on and as science progresses further, more and more technologies were developed to provide human being for better life condition, the technologies which were developed give better life for human being, but also led to many problems in the world. For example motor vehicles which use the fossil fuel are developed to facilitate transportation however the emission of carbon dioxide from the engines of the motor vehicle causes the greenhouse effect which lead to the global warming (Paterson, 2013) and global warming which lead to the melting of the polar ice (Rosser, 2008). The issue of global warming was so serious that prompting the United Nation to convene series of convention to deal with the problem. The first conference on the environment was convened in Stockholm in the year 1972, in which the United Nation formulated the first environmental law and release the declaration known as the Declaration of the United Nation Conference on Human Environment.

In 1990, the United Nation convened the conference in Montreal Canada, and issued the Montreal Protocol of Substance that deplete the ozone layer (Shawkat, 2013). The Rio declaration on the environment and development was released in 1992 after the Earth Summit which convened in the Brazilian city of Rio de Janeiro. The convention created systems for reporting data on the emission of greenhouse gases. Later in 1997, again the United Nation convened yet another convention on the environment in the Japanese city of Kyoto, and issued the Kyoto Protocol which set target and time tables for 38 countries to control the emission of the greenhouse gases.

The emergence of science has also lead human being to the question on the validity of religious teaching. In the western society, Christianity seems to be less attractive after being faded away by science and empiricism. The influence of science on religion is generally seen to be disastrous among western society, whom become more secular than it has ever been and the reason lies among others from the growth of science and the intrusion of technology into every

walk of life until science and technology itself has become the new religion to be embraced (Ridley, 2001). The demise of Christianity in the western society led to the degeneration of the society itself as predicted by Arnold Toynbee (1988). One of the fatality of the death of religion in the western society is the decline of the population (Pavlovic, 2009). The sexual revolution, the feminist movement, and the 1980s and 1990s movements in favor of gay and lesbian rights have exploded through the Western world. On top of that, the issue of the extermination of human race was raised by Stephen Hawking in his interview with the British Broadcasting Corporation (BBC) in which he said that the Artificial Intelligent proven to be very useful for human being, but he warned that the Artificial Intelligent can destroy human race.

From the above discussions, much has been written about the influence and impacts of science towards the life of mankind as whole, but much less is understood on what actually the perceptions of people, particularly from a third world country like Malaysia. This research therefore takes the perspective of how Malaysians perceive on this issue. There is clearly a need to take a on a questionnaire survey to understanding how Malaysians perceive the impact of science on their daily life which is in line with the need to reform and mould the scientific mind of its young generations (S Maimunah, 2003).

There are a few important points which stand this study as a vital step to deal with various issues. First, this study would address the importance on how Malaysians view science and scientific advancements that could affect their lives, either positive or negative. Secondly, this study would lead a pathway to better comprehend the alternative science education for future generations among Malaysians (Hodson, 2010). This would surely provide benefit to the policy makers as well as researchers at large. Finally, the motivation of this study is none than to grasp how Malaysians really appreciate the advancements of sciences and scientific advancements in the daily life in a holistic view.

Method of the Study

The study was conducted to 644 respondents, male and female from the age of 20 to 55. The respondents were obtained randomly from all over the Malaysia. The respondents were given booklets of questionnaire containing statement about the issue of the implementation of the Islamic law. Each statement was provided with responses in the form of Likert type scale, ranging from 1 (strongly disagree), 2 (disagree), 3 (not sure), 4 (agree), and 5 (strongly agree). Likert scale was used in this study because it measures attitude of the respondents. Kothari (2011) listed five reasons why Likert scale is good instrument of test. The five reasons are: First, it is relatively easy to construct. Second, it is more reliable instrument because under it, respondents answer each statement included in the instrument. Third, each statement included in the Likert scale is given an empirical test for discriminating ability. Fourth, Likert scale can easily be used. Fifth, it is take less time to construct.

In this study the respondents were give 30 minutes to respond to the questionnaire, and the booklet were collected to be analysed using the Statistical Package for the Social

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Sciences (SPSS) to obtain the mean responses, the percentages of the responses. The mean difference were also tested using the t-test for the independent samples and also using one-way ANOVA. The means, the percentages and also the t-test result as well as the one-way ANOVA test are presented in the form of tables and diagrams.

The descriptive form is also used at par with the requirement of the study to understand in its real phenomenon (Mohd Majid 1990). Thus, a survey instrument is developed for this study based on the literatures selected. According to Tuckman (1999), a questionnaire is an effective way to gain information from the respondents. All questions are in positive form and the respondents were required to state their perceptions according to the Likert scale. The Sample Size Determination Table by Krejcie and Morgan (1970) is adopted. The sample size for this study is 38 based on Krejcie and Morgan (1970)'s Sample Size Determination.

In this study, the validity of the questionnaire is determined by an expert. Reliability refers to the stability and consistency in the instrument in measuring a particular concept. A popular test in measuring the consistency of a concept is the Cronbach Alpha. The reliability value of the Cronbach Alpha is between 0.0 and 1.0. According to Mohd Majid (1990), the Cronbach Alpha value more than 0.60 is often applied as the reliability index in a particular research. Thus, in this study, researcher has determined the Cronbach Alpha value that is more than 0.60 as the reliability value for every section of the questionnaire being tested. The results of the analysis were interpreted and discussed at the last part of this paper.

Data Analysis

The raw data which was obtained through the questionnaire was analysed using the Statistical Package for the Social Sciences (SPSS) according to the following sequences. First, the mean response of all the respondents. Second, the percentages of the response. Third, on the mean response of the respondents based on religion. Fourth, the percentages of the responses based on the religion of the respondents. The responses to the statement was analysed. The result of the analysis is shown in table 1

Table 1: the percentage of the responses of all the respondents.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	42	3.3	6.5	6.5
Disagree	161	12.5	25.0	31.5
Not sure	225	17.4	34.9	66.5
Agree	143	11.1	22.2	88.7
Strongly agree	72	5.6	11.2	99.8

Table 1 shows the percentage of the respondents who strongly disagreed with the statement "Science will ultimately lead to the destruction of the world" was 6.5%, those who disagreed was 25%, those who were not sure was 22.2% and those who was strongly disagreed was 11.2%. The percentages of the responses were plotted to form a line graph as shown in diagram 1 below.

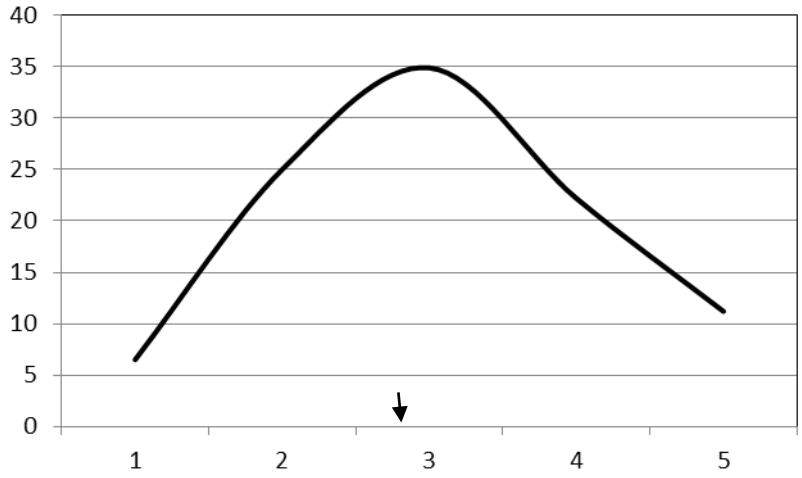

Diagram 1: the percentage line graph of the responses of all
The respondents.

Responses

Diagram 1 shows the percentage line graph for the response of all the respondents. The graph was close to normal graph, with the highest percentage of response was for the response 3 which was not sure. The arrow shown in diagram is located at response 3 which was not sure. The next analysis was to obtain the mean response for all the respondents. The result of the analysis is shown in table 2.

Table 2: the mean response of all the respondents.

	N	Minimum	Maximum	Mean	Std. Deviation
	644	1.00	5.00	3.0652	1.08522
Valid N	644				

Table 2 shows that the mean response was 3.0652. If the mean is brought to the nearest round number, the mean response is 3 which indicated that the respondents was not sure. Therefore the result of the analysis showed that the respondents were not sure that "Science will ultimately become detrimental to the world" the result of the analysis is shown in table 3. The

next analysis was to obtain the mean response according to the academic background i.e. science and non-science background. The result of the analysis is shown in table 3.

Table 3: The percentage of the responses of the respondents based on the academic Background of the respondents.

		Science		Non-Science
Strongly disagree	32	9.2	9	3.1
Disagree	91	26.1	69	23.6
Not sure	121	34.7	104	35.6
Agree	64	18.3	79	27.1
Strongly agree	41	11.7	31	10.6
	349	100	292	100

Table 3 shows that the percentage of the respondents whose academic background was science was 9.2 % strongly disagree, 26.1% disagree, 34.7% not sure, 18.3% agree and 11.7% strongly agree, while the respondents whose academic background was non-science, 3.1% strongly disagree, 23.6% disagree, 35.6% not sure, 27.1% agree and 10.6% strongly agree. The percentages of the responses was plotted to form the line graphs as shown in diagram 2.

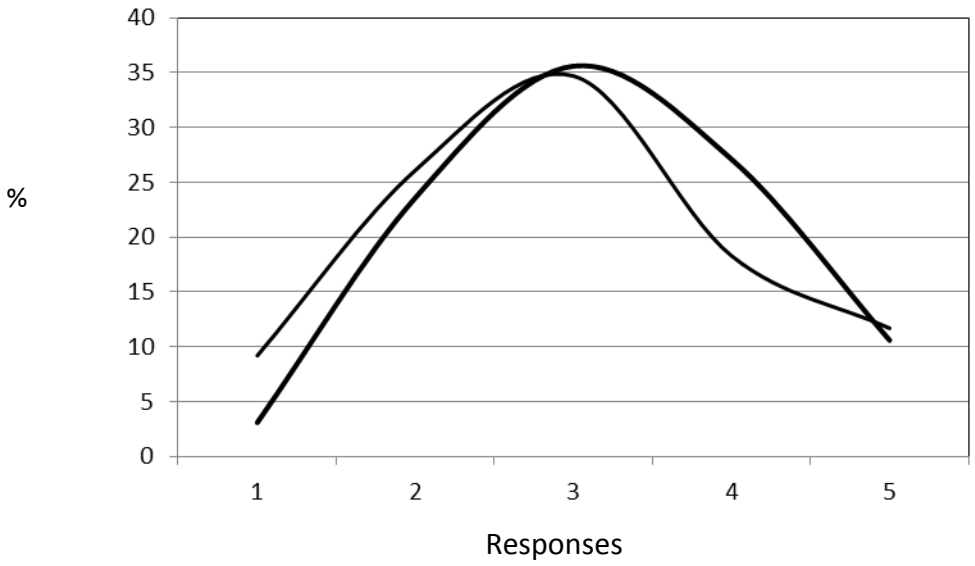

Diagram 2 shows the line graph of the percentages of the response of the respondents whose academic background was science and the line graph for the respondents whose academic background was non-science. The mode for the respondents was located smaller than 3 (not sure) and the mode for the respondents. The next analysis was to obtain the mean based on the academic background of the respondents. The result of the analysis is shown in table 4.

Table 4: the mean response according to the academic Background of the respondents.

Academic background	Mean	N	Std. Deviation
Science	2.9742	349	1.13306
Non-Science	3.1849	292	1.01198

Table 4 shows the mean response of the respondents whose academic background was science was 2.9742 and the mean response of the respondents whose academic background was non-science was 3.1849. The respondents whose academic background was in science seemed to have smaller mean response compare to the respondents whose academic background was non-science. The difference of mean was tested using the t-test to see if the difference of mean is significant or otherwise. The result of the analysis is shown in table 5.

Table 5: t-test between the mean responses of the respondents based on The academic background.

F	Sig.	t	df	Sig. (2-tailed)
.689	.407	-2.461	639	.014
		-2.486	636.261	.013

Table 5 shows that the p value is 0.014 and the value is less than the critical value of 0.05. This indicated that the difference of mean between the responses of the respondents based on their academic background was significant. The next analysis was to obtain the mean response based on the gender of the respondents. The next test was to obtain the mean of the respondents based on their religion. The result of the analysis is shown in table 6.

Table 6: the mean responses of the respondents base on the Religion of the respondents.

Religion	Mean	N	Std. Deviation
Islam	3.0497	443	1.10624
Christianity	3.0000	59	1.00000
Buddhism	3.1222	90	1.01481
Hinduism	3.1667	48	1.11724

Table 6 shows the mean of the response of the respondents based on the religion of the respondents. The mean response of the Muslim respondents was 3.0497, the Christian was 3.000, Buddhists was 3.1222 and the Hindu was 3.1667. The mean responses seem to be different from each other, but they were close to each other.

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Discussion

The results of the study showed that the mean for the statement "science would ultimately lead problem to the world" was 3.0652 (See table 2). If the mean is brought to the closest round number, the vale become 3 and this indicated that the respondents were not sure if science will ultimately leads to problem to the world. This result shows that the respondents were uncertain about the nature of science which, the majority of the people think positively about science. The negative side of science are not highlighted in many discourses because there was no necessity for doing so.

Science is regarded as an important tool for economic development of a nation so much so that many governments promoted science education (Cobern, 1998). Promoting the negative aspect of science, such as singling out science as the factor for the destruction such as the global warming, ozone layer depletion and the atomic bomb will shun the people away from science. The neutrality of the respondents on the statement "Science would ultimately lead to problem to the world" is seen from the percentages of the responses (see table 1 and diagram 1) where 39.4% of the respondent chose to be neutral. The percentage line graph, which show the normal curve showed that the mode is at response 3 which was neutral. Therefore the study found out that respondents were not sure about the bad aspect of science. The result of the study showed that the mean response of the respondents whose academic background was science was 2.9742 and for the female was 3.1849. (See table 4)

The result of the study has also shown that there was a significant difference of mean between the mean response of the respondents whose academic background was science and the respondents whose academic background was non-science (See table 5). The respondents whose academic background was science seemed be more sympathetic to science than the respondents whose academic background was non-science. The New Scientist (15 February 1985), the magazine which is devoted to science and scientific research reported a survey made on what did people thought about science. According to the report, science was a good thing, 45% of the respondents science and technology did more good than harm and 38% of the respondents said the good and the harm of science was balanced out. Surprisingly, the survey which was conducted in the United State and which was reported by the New Scientist thirty years ago was almost similar to the finding of this study.

Similarly, the New Scientists also reported that the survey made showed that those respondents who have a higher level of science or those who have more contact with science in their work were likely to think that science 'is good thing'. The result of the analysis showed that there were very small difference of mean responses between the respondents based on the religion and the difference of means were not significant (see table 6).

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Conclusion

The results of the study shows to us that the advancement of sciences in human live brings in positive impacts towards humankind as well as some negative side of it. Further effects of science need to be explored in many future discourses to better understand its impacts on humankind at large.

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