

Perception and Attitudes towards Science

Xjenza - The Malta Council for Science & Technology

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A MISCO INTERNATIONAL REPORT



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INTRODUCTION

- 1.1 MISCO International was commissioned by The Malta Council for Science and Technology (MCST) to carry out research among the general public with the main objectives to:
- Gauge the general public level of interest in science,
 - Understand the perception and attitudes of the general public with regards to science and science-related activities and/or initiatives,
 - Gauge the impact of science initiatives across different levels and parts of the community,
 - Provide an insight into science communication at local and national levels.
- 1.2 This research was carried out by means of a Computer Aided Telephone Interviewing (CATI) system, with a total of 400 respondents, aged 16 years and over, across Malta and Gozo. This report outlines a number of salient points emerging from the survey.
- 1.3 The report contains five sections covering different aspects. These are demographics, interest in science, searching for science and technology-related information, awareness and participation at science-related events, and science and the government.
- 1.4 The tables with statistical data, together with data in SPSS format are presented separately.

BACKGROUND

- 2.1 The Malta Council for Science and Technology, for and on behalf of the Foundation for Science and Technology, is a public body established by central government in 1988.
- 2.2 The Council was given the specific mandate of advising government on Science and Technology policy. Today, its remit has developed and its tasks have expanded to include:
- The responsibility for National Strategy in the field of Research and Innovation (R&I) and the ownership of the National Strategic Plan.
 - Responsibility for Policy in the area of Research and Innovation.
- MCST also represents government in EU fora related to R&I. These fora include:
- CREST which facilitates the progress of policy coordination throughout Europe,
 - Joint Research Centre Board of Governors,
 - DG Research working parties,
 - EIT (European Institute of Technology) working parties,
 - ESFRI (European Strategic Forum on Research Infrastructure).
- The management and administration of the National Research and Innovation Funding Programme.
 - The responsibility as National Contact Organisation for creating awareness and providing support for EU's Research and Development Framework Programme (Horizon 2020).
- 2.3 The three main components of the Malta Council for Science and Technology are:
- Strategy Policy and Internalization in Research and Development,
 - R&I Programmes,
 - Science Popularisation.
- 2.4 The Malta Council for Science and Technology is also embarking on ambitious projects which include a state of the art interactive Science centre and a number of other EU funded projects aimed at transforming Villa Bighi into a hub for creativity, research and development.

METHODOLOGY

- 3.1 This research was carried out by means of a Computer Aided Telephone Interviewing (CATI) system, with a total of 400 respondents, aged 16 years and over, across Malta and Gozo.
- 3.2 A 70% quota on age, gender, education and region was applied. Data was then weighted according to the information provided in the NSO 2011 Census, thus making the data representative of the general population in Malta and Gozo.
- 3.3 Respondents were randomly selected from the Maltese population. Telephone numbers were randomly selected from the telephone directory.
- 3.4 Prior to the launch of fieldwork, a pilot study was carried out with 10% of the sample (i.e. 40 respondents). The same methodology was used both for the pilot study and the full launch of the research project. The pilot study helped to verify the translation, validity and reliability of the questionnaire. Minimal changes were made to the questionnaire following the pilot study and due to this, the answers obtained during the pilot study were used as part of the final sample (i.e. the 400 respondents).
- 3.5 The questionnaire adopted for this research project was designed by MISCO International based on a detailed client brief that was in turn based on an internal review of similar surveys in other European Member States. The questionnaires were available in both Maltese and English and the approximate length was of 15 minutes. A copy is reproduced in Annex I.
- 3.6 Interviewers involved in the project were selected from MISCO's pool of interviewers, who are all experienced and have been trained to carry out market research interviews. All interviewers were briefed on the purpose and method of the research before initiating fieldwork.
- 3.7 The pilot study was carried out on 18th February 2014, while the main interviews were carried out between 21st February and 25th February 2014. Fieldwork hours for household surveys take place between 16:00 and 20:30 on Monday to Friday, and between 09:00 to 13:00 on Saturdays.

- 3.8 Once fieldwork was completed, the questionnaires were checked, coded and passed on for data analysis.

CONFIDENTIALITY

- 4.1 MISCO International assures clients that the results of this research are confidential to them. Should clients wish to publish any of the results, the text for publication must be approved by MISCO International Limited.
- 4.2 Questionnaires will be electronically stored in a secure place for a period of two years from date of invoice. We are 100% committed in protecting confidentiality and therefore research-related material will be deleted in a secure manner, after this period.
- 4.3 MISCO International is a member of the European Society for Opinion and Marketing research and undertakes its work in accordance with the code of practice of this organisation.



STATISTICAL SIGNIFICANCE

- 5.1 In order to test for statistical significance of the mean scores obtained as a result of the survey, the T-test was used. The T-test indicates whether or not the difference between the mean score of two groups is in fact “real” and thus reflected in the same way in the population from which the groups were sampled.
- 5.2 The product of the T-test is the p-value. Should the p-value be lower than the score of 0.05 the difference between mean scores is considered being statistically significant (i.e. the actual difference in mean score is also observed in the population). Should the p-value exceed the score of 0.05, the difference between mean scores is considered not to be statistically significant. Having said this, noteworthy observations could still be identified even though results are not statistically significant.
- 5.3 In the statistical tables, a row featuring “ $P(m_x=m_o) < 0.05$ ” was added. This is the probability that the crosstab mean (m_x) is equal to the overall mean (m_o). If the crosstab mean score is less than 0.05, this shows that the difference in mean scores is

statistically significant, at the 95% confidence level. The closer the p-value is to 0, the more significant the relationship is.

- 5.4 Throughout the report, for crosstab mean scores which are statistically significant in their difference from the overall mean score, the p-value will be indicated in brackets.

OVERVIEW

- 6.1 Almost half of the interviewed respondents reported that they are *rather not interested* or *not interested at all* in science. Respondents of an older generation were more likely to report this lack of interest in science, as were those from lower socioeconomic classes, those who are retired, currently unemployed, those responsible for home duties and those with a secondary level of education or lower.
- 6.2 The main factor which affected respondents' lack of interest in science was that they never had any interest or liking for this particular field. Having never learned or studied science subjects at school also led to their disinterest in this subject, while a good percentage of respondents also mentioned that they find the subject difficult to understand.
- 6.3 Out of the respondents who showed an interest in science, a quarter of these stated that the reason for this was to increase their general knowledge.
- 6.4 The need to gain more knowledge was one of the main factors that affected respondents' interest in science. New developments in the health industry and the fact that science affects everyday living were other motivators. Five percent of respondents claimed to be interested in science because their children study the topic.
- 6.5 Male respondents and those of the younger generation were more interested in areas of science related to discovery, while females and those belonging to the older age bands, showed more interest in the health and environment sectors.
- 6.6 The interviewed respondents believe that a more hands-on and interactive approach to science during school lessons, more emphasis on science in education, and the introduction of new laboratories are the top three factors which would help people, especially youth, to foster an interest in science.
- 6.7 Around half of the respondents claimed to be *not very well* or *not at all informed* about science. Respondents aged up to 19 years old were more likely to be well informed about science. Those aged 55 years and older were much less likely to be well informed, as were those with a primary level of education, those who never attended school or never studied science.

- 6.8 Most respondents claimed that they see and hear too little information about science. A noteworthy figure is that 30% of respondents who had previously declared that they were rather or very interested in science also claimed that they see and hear too little information about the topic.
- 6.9 Television and internet were the two most mentioned media on which respondents come across information about science and technology when they are not actively searching for it.
- 6.10 When specifically asked whether they have ever searched for information about science and/or technology, less than half of interviewed respondents claimed that they either currently search or have searched for this type of information in the past. The main reason cited for actively searching for science-related information is to increase general knowledge. Others mentioned that it is related to their work or study. The internet is by far the main source that the majority of respondents resort to search for science-related information.
- 6.11 Respondents who do not search or have never searched for information about science and/or technology, mainly cited the reasons of no interest in, and difficulty with understanding the subject.
- 6.12 Sixty-five percent of individuals claimed that they always find the information that they are or were searching for, while 34% said that sometimes they do, while sometimes they do not manage to find this information. However, most believe that this information is sometimes difficult to understand.
- 6.13 There is a general interest in this field, with 77.6% of respondents claiming that they would like to have more information about science and technology. However, most respondents are concerned with the language used when the subject of science and technology is discussed. In fact, 64.8% of respondents said that they find it hard to understand science, and about 79% of respondents stated that they would be more interested in science and technology if they were discussed in everyday language and that science and technology are too specialised for most people to understand.

- 6.14 With regards to science and technology-related activities, the activity which is carried out most often is watching documentaries. Attending public meetings and events on science-related topics were the activities which most respondents have never engaged in.
- 6.15 Slightly more than half of the respondents stated that they have never heard of any of the science and technology-related events that were prompted. Out of all these events, Science in the City was the event that most respondents were aware of, and participated in. The main reason why respondents took part in these events was because they find them interesting. A few others participated due to their children's or grandchildren's interest in science.
- 6.16 More than two out of every three respondents feel that the best qualified and trusted persons and/or organisations to explain the impact of scientific and technological advancements to the public are individuals working in the science industry. Political parties and religious groups are the least trusted to relay this information.
- 6.17 Respondents believe that they have little influence on laws about scientific issues and they would like the state of their current influence to increase.
- 6.18 In general, the majority of respondents believe that Government funding for science research should increase as research is important for the economy. They also believe that the public should be informed about advancements in the area of science and the implications of these advancements.

INTERPRETATION OF RESULTS AND DISCUSSION

DEMOGRAPHICS

7.1.1 The telephone survey was carried out with persons in the household who were aged 16 years or older. Half of the respondents (50.6%, 202 respondents) were female, while 49.4% were male (198 respondents) (*Figure 1*). A spread of the different age groups was achieved, as shown in figure 2 below.

Figure 1 - Gender
Base: 400 respondents

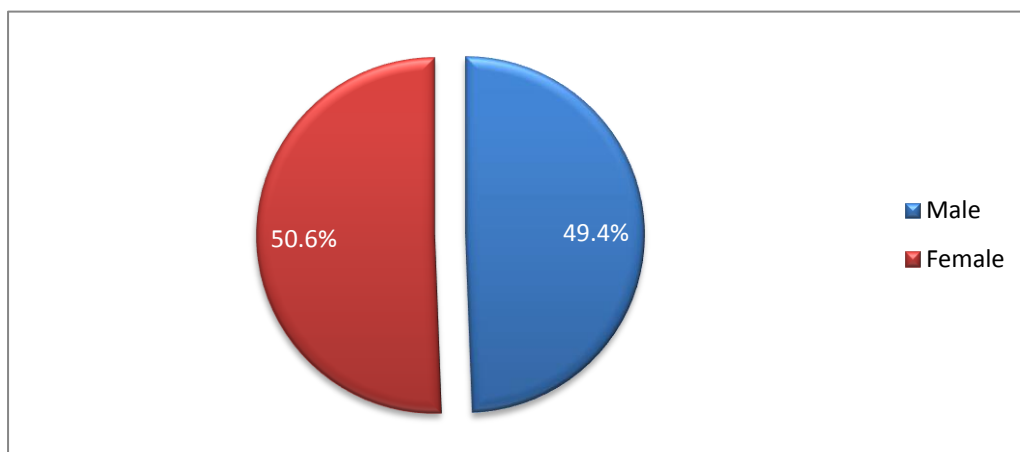
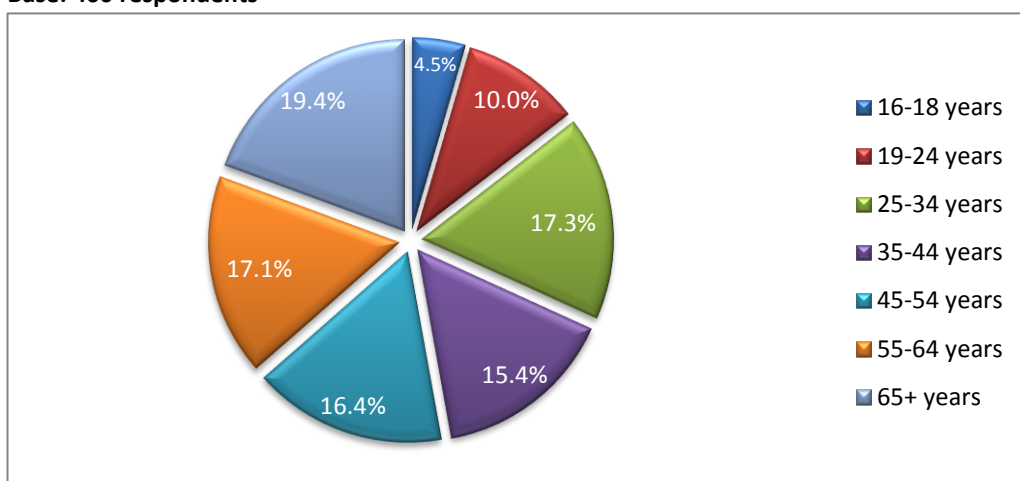
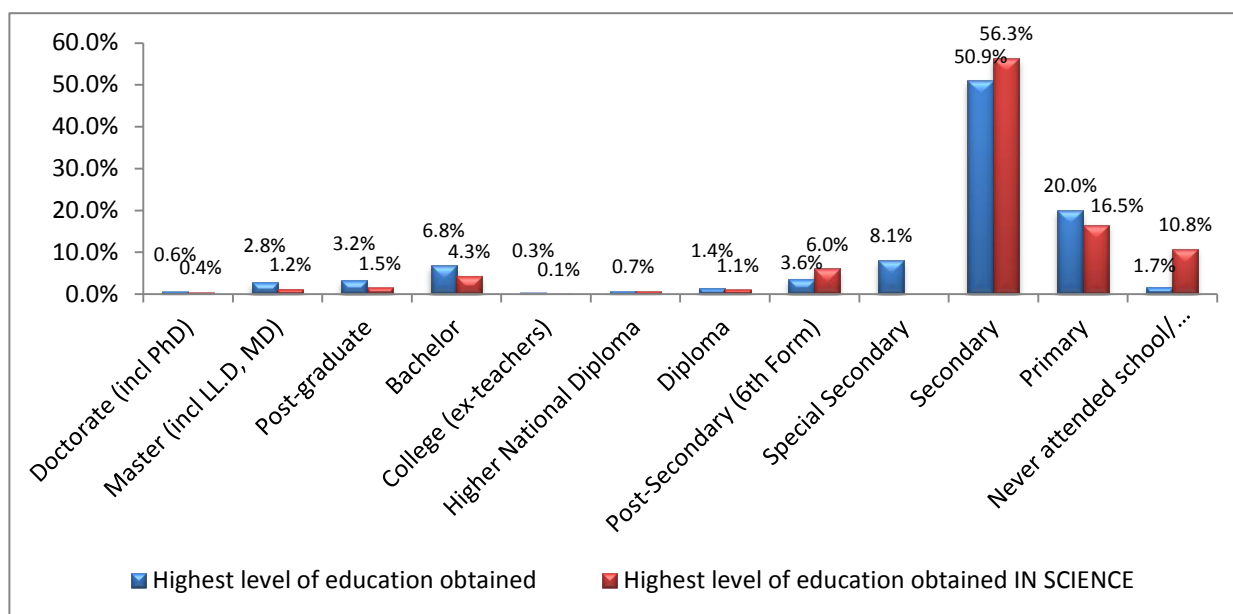


Figure 2 - Age
Base: 400 respondents



7.1.2 Respondents were asked to identify their highest level of education, together with their highest level of education in science. In both cases, most respondents have completed a secondary level of general education and education in science.

Figure 3 - Level of Education
Base: 400 respondents



7.1.3 One-third of the interviewed respondents had full-time employment (33.6%, 134 respondents), 28.6% were responsible for home duties (114 respondents), 18.5% were retired (74 respondents) and 10% were full-time students (40 respondents). Further analysis of the respondents' occupation is found in Figure 4. The socioeconomic groups of respondents were then identified by asking for the occupation of the chief wage earner of the household.

7.1.4 Socioeconomic group A/B includes professional or managerial occupations, such as high ranking police/army officers, engineers, accountants, doctors, and teachers. Socioeconomic group C1 includes clerical, executive, administrative occupations, supervisory and office work, together with sales representatives, stock controllers, and housekeepers. Socioeconomic group C2 is made up of any skilled occupation, such as plumbers, electricians, tile layers, carpenters, photographers, heavy vehicle drivers, and bus drivers. Socioeconomic group D/E includes all occupations which do not require any particular skill – such as sales assistants, waiters, care workers, cleaners, factory workers, delivery persons, and labourers. It also includes all individuals who are considered to be inactive – such as those unemployed, or living on social benefits.

7.1.5 The following graphs show a breakdown of the occupation of the respondents, together with the particular socioeconomic groups that respondents were categorized in.

Figure 4 - Occupation
Base: 400 respondents

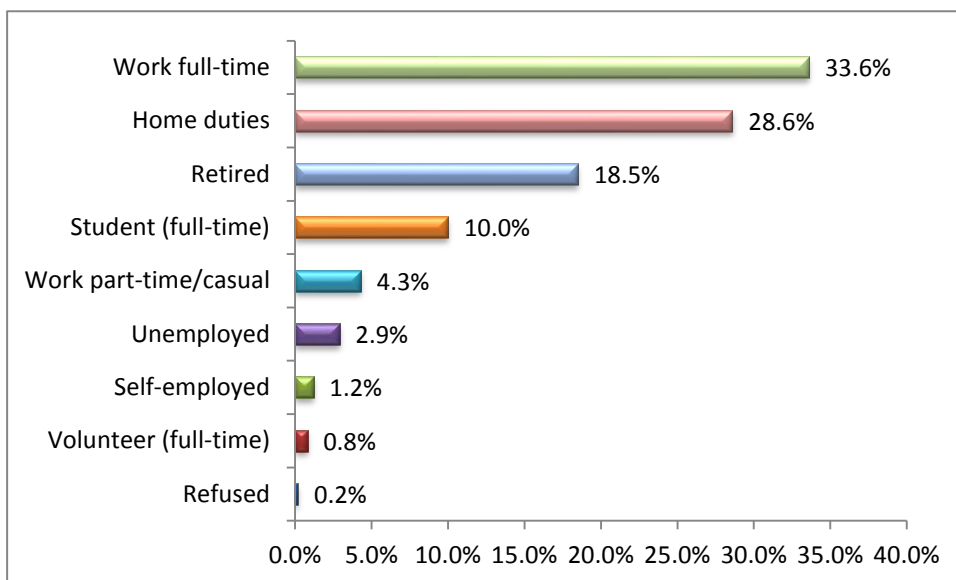
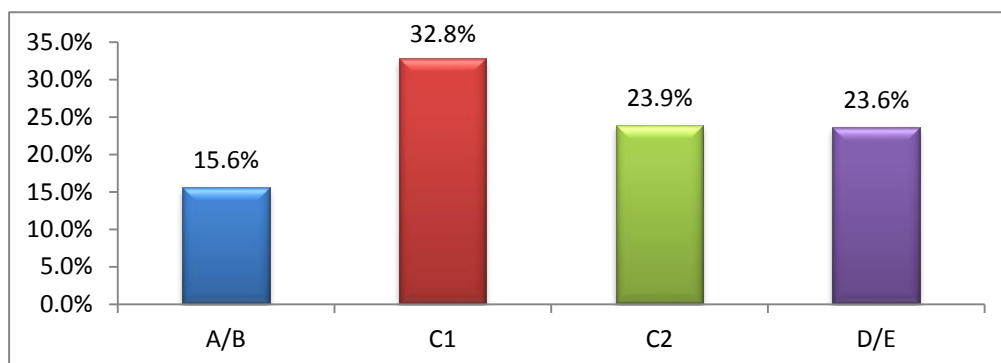
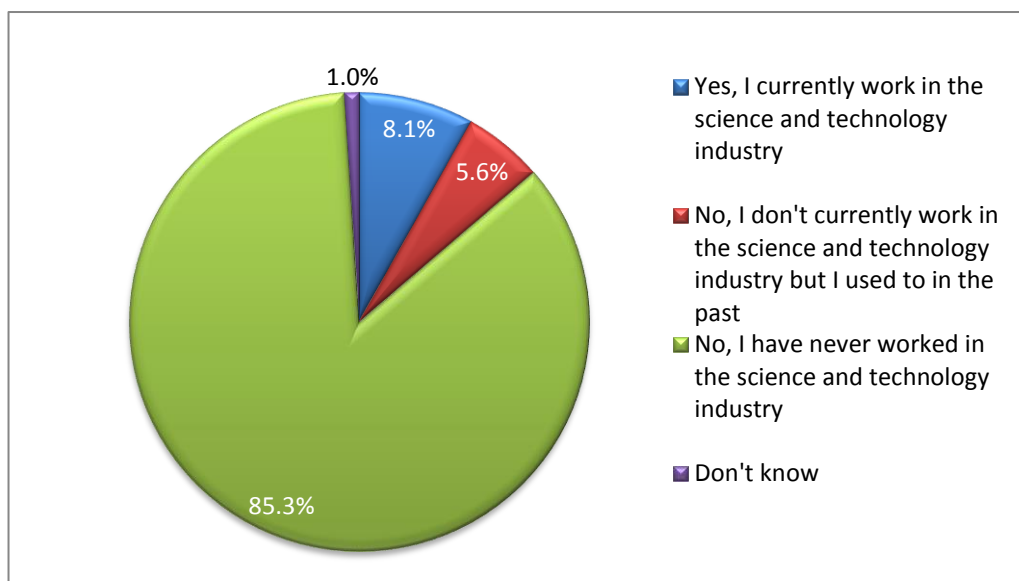


Figure 5 - Socioeconomic Class
Base: 400 respondents



7.1.6 The majority of respondents claimed to have never worked in the science and technology industry (85.3%, 341 respondents), while 8.1% said that they currently do so (33 respondents). A further 5.6% maintained that they used to work in the science and technology industry in the past (22 respondents) (Figure 6).

Figure 6 - Working in the science and technology industry
Base: 400 respondents



7.1.7 The region that the respondents live in was also determined by asking for their locality of residence. A representation of the spread of the Maltese population across regions was achieved and is shown in Figure 7. Furthermore, the localities that form part of each region are found in Table 1.

Figure 7 - Region
Base: 400 respondents

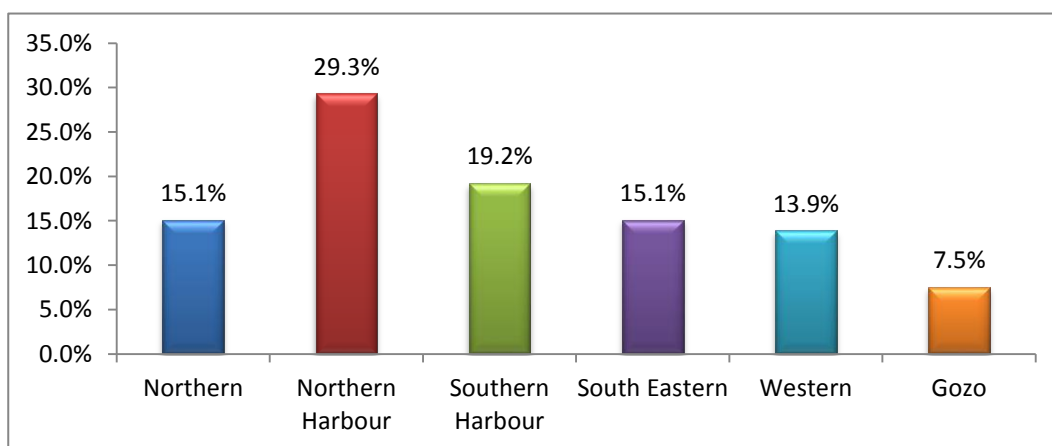
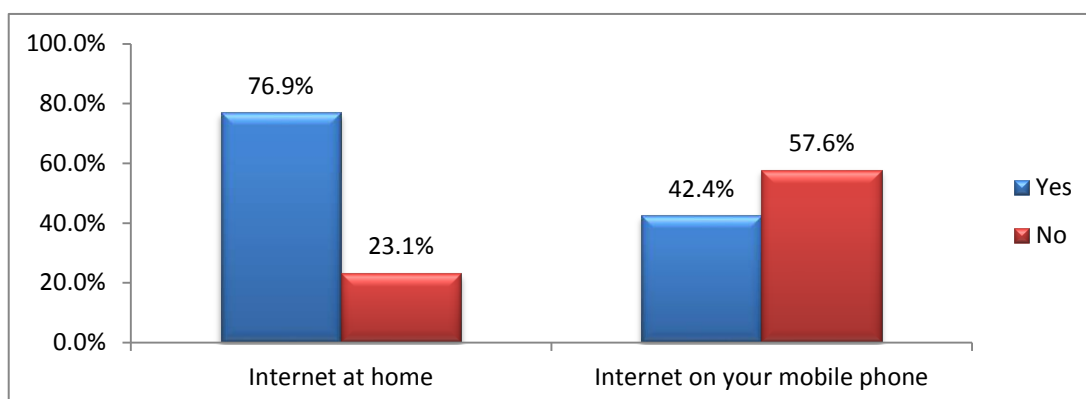


Table 1 - Localities by region

Northern	Armier	Gharghur	Mellieha	San Pawl il-Bahar
	Bahar ic-Caghaq	Madliena	Mgarr	San Pawl tat-Targa
	Bidnija	Maghtab	Mosta	Wardija
	Birguma	Manikata	Naxxar	Xemxija
	Bugibba	Marfa	Qawra	Zebbiegh
	Burmarrad			
Northern Harbour	Birkirkara	Kappara	Pieta	Sliema
	Gwardamanga	Mriehel	Qormi	Swatar
	Gzira	Msida	San Giljan	Swieqi
	Hamrun	Paceville	San Gwann	Ta' Xbiex
	Ibrag	Pembroke	Santa Venera	
South Eastern	Birzebbuga	Kirkop	Mqabba	Marsascala
	Ghaxaq	Marsaskala	Qrendi	Zejtun
	Gudja	Marsaxlokk	Safi	Zurrieq
Southern Harbour	Birgu	Isla	Paola	Valletta
	Bormla	Kalkara	Santa Lucija	Xghajra
	Fgura	Luqa	Tarxien	Zabbar
	Floriana	Marsa		
Western	Attard	Iklin	Mtahleb	Siggiewi
	Bahrija	Lija	Mtarfa	Ta' Qali
	Balzan	Mdina	Rabat	Zebbug
	Dingli			

7.1.8 More than half of the interviewed respondents claimed to have access to internet at home (76.9%, 308 respondents), while respondents were less likely to have internet access on their mobile phone. In fact, just 42.4% of respondents claimed to have such access (169 respondents).

Figure 8 - Access to internet
Base: 400 respondents



INTEREST IN SCIENCE

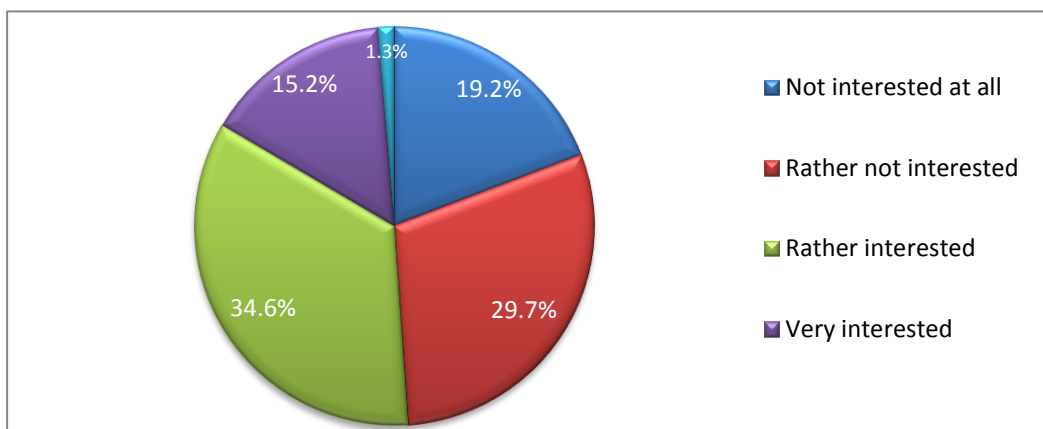
- 7.1.9 The first section of the questionnaire dealt with general interest in science. Questions focused on:
- Personal interest in science,
 - Factors that led to interest in science or lack thereof,
 - Areas of science which are found to be most intriguing,
 - Factors that would help develop people's interest in the area of science,
 - Extent of being informed about science.
- 7.1.10 When asked to rate their general interest in science on a 4-point scale, where 1 meant no interest at all and 4 meant very interested, almost half of the respondents reported a low score – meaning, they claimed to be *rather not interested* or *not interested at all* in the subject (48.9%, 195 respondents). The average score obtained by the whole population was that of 2.465.
- 7.1.11 When compared to the average result of the general population¹ (48.9%), respondents of an older generation (typically those aged 65+ years) were much more likely to report a lack of interest in science (62.2%), while those aged 16 to 18 years old were more likely to show interest (39.6%). Those belonging to lower socioeconomic classes were also more likely to be less interested in science (Socioeconomic Class C2 – 55.7%; D/E – 56.9%) than the average population (48.9%), as were those who have never worked in the science industry (51.2%), those who are retired (58%), currently unemployed (56.5%), those responsible for home duties (56.7%), those who are working full time on a voluntary basis (100%) and those with a secondary level of education (53.6%), primary level (58.8%) or never attended school (100%). Males are also more likely (50.9%) to be less interested in science than females (46.8%).
- 7.1.12 The scores obtained in interest in science of those aged 65+ years (2.078) [p=0.001], those in the socioeconomic classes C2 (2.274), D/E (2.297), males (2.448), those retired (2.233), those on home duties (2.265), those who work full time on a voluntary basis (2.000) [p=0.000], those who have never worked in the science and technology industry (2.365), and those with a secondary level of education (2.379), or primary (2.175) [p=0.017] or never attended school (1.000) [p=0.000] were all below the average score

¹ The average result of the general population is that shown in Figure 9

of the general population. On the other hand, in particular, those belonging to the highest socioeconomic class – A/B, achieved a mean score significantly higher than the average score in interest in science (2.810) [p=0.006], as did those who are currently working in the science and technology industry (3.152) [p=0.000], and those who have a post-secondary level of education and higher [p-value ranges from 0.042 to 0.000].

7.1.13 Respondents coming from the Southern regions, Western regions and Gozo are more likely to report a lack of interest in science. The highest score in interest was that obtained by respondents coming from the Northern Harbour areas (2.724) [p=0.013], while the lowest mean score was obtained by those coming from the Southern Harbour areas (2.247) [p=0.044].

Figure 9 - Interest in Science
Base: 400 respondents



7.1.14 Respondents who claimed that they were not interested in science were asked to identify the main factors that have affected their lack of interest in this area. The main factor mentioned in this regard was that these respondents never had any interest or liking for the particular field [science] (38.5%, 75 respondents). This was followed by respondents who claimed that having never learned or studied science subjects at school has led to their disinterest in this subject (22.5%, 44 respondents). Significantly, a good percentage of the respondents mentioned that they find the subject difficult to understand (18.3%, 36 respondents). The table overleaf lists all the reasons mentioned by these respondents.

Table 2 - Reasons for lack of interest in science
Base: 195 respondents (not interested in science)

Reason for lack of interest in science	%
Never had any interest or liking for science	38.5%
Never learned / studied any science subjects at school	22.5%
I don't understand the subject	18.3%
The subject is difficult	13.3%
Science is in English/ I don't understand English	7.3%
Not my line of work	7.1%
Lack of time	1.7%
I don't believe in scientists/ people working in the sector	0.5%
Lack of job opportunities in the science industry in Malta	0.2%
Media does not portray a true picture of science	0.0%
Don't know	4.9%

7.1.15 Interestingly, the majority of replies in the age group 16-18 years (82.5%) and the largest amount of replies of the highest socio-economic class A/B attribute the difficulty in understanding the subject as the main factor that has affected their lack of interest. The largest amount of replies of the age group 19-64 years and lower socio-economic classes attribute the fact that they never had any interest or liking for science.

7.1.16 On the other hand, out of the respondents who showed an interest in science (49.8%, 199 respondents), a quarter of these stated that the reason for this was to increase their general knowledge (23.5%, 47 respondents), while 14.3% maintained that it is a subject that is/was studied (29 respondents). Fifteen respondents (7.7%) could not identify a specific reason for their interest. The six most-mentioned reasons for being interested in science are featured in the table below.

Table 3 - Reason for interest in science
Base: 199 respondents (interested in science)

Reason for interest in science	%
To increase general knowledge	23.5%
Subjects studied at school/University/a specific educational course	14.3%
It affects everyday living	13.7%
I like / am interested in science	9.7%
It is part of my job	8.4%
Interested in new developments (unspecified)	7.1%

7.1.17 As expected, up to a secondary level of education, the largest amount of respondents give 'to increase general knowledge' as the main reason for why they are interested in science but from secondary upwards, the largest amount of respondents give 'subject

studied' or 'subject part of my job' as the main reason for why they are interested in science.

7.1.18 When respondents who were interested in science were asked to mention the main factors that have affected their interest in this topic, the point mentioned the most was the need to gain more knowledge (18.5%, 37 respondents). New developments in the health industry (13.0%, 26 respondents) and the fact that science affects everyday living (11.3%, 23 respondents) were other motivators. 5.2% of respondents claimed to be interested in science because their children study the topic. Once again, a proportion of the respondents were not able to identify any particular factor which led to their interest in the topic (13.4%, 27 respondents). The main motivating factors which received 5% or more of mentions, are found in the table below.

Table 4 - Main factors affecting interest in science
Base: 199 respondents (interested in science)

Main factors affecting interest in science	%
Gaining more knowledge/ General knowledge	18.5%
New developments in the health sector	13.0%
Science affects living	11.3%
I like science subjects	9.4%
Interested in technology	7.8%
My interest toward environment	7.7%
My children study science subjects	5.2%
My / a family member's line of work	5.1%
School subject/ teachers	5.0%

7.1.19 A large majority of respondents in the age range 16-18 years (71.8%) identify the gaining of more knowledge as the main factor that has affected their interest in science.

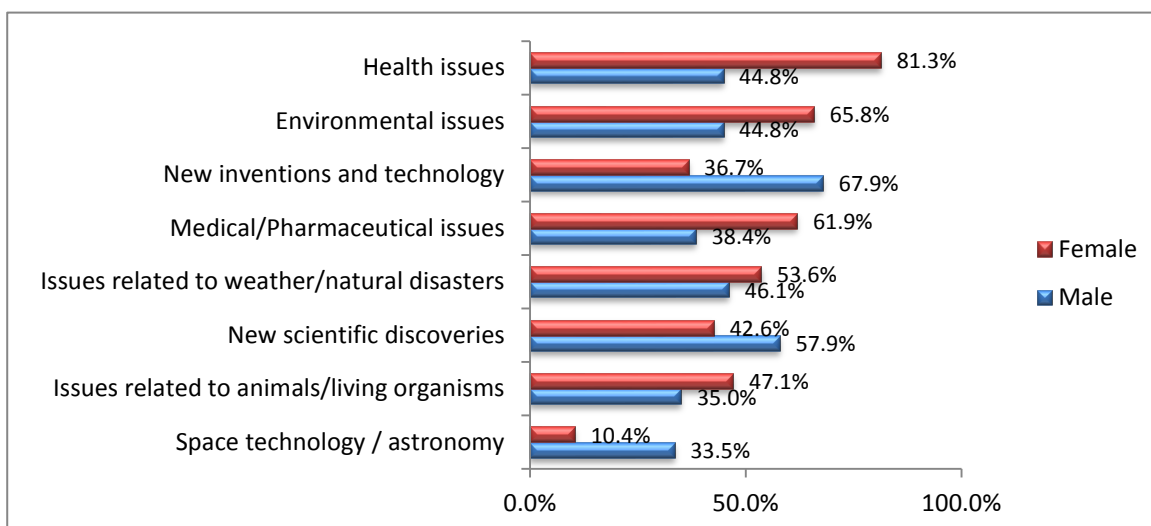
7.1.20 The areas of science which respondents felt the most curious about were:

- Health issues 64.3%
- Environmental issues (ex. Cities, deserts, forests) 56.0%
- New inventions and technology (ex. Gadgets/robots) 51.2%
- Medical/Pharmaceutical issues 51.0%
- Issues related to weather/natural disasters 50.1%
- New scientific discoveries 49.7%
- Issues related to animals/living organisms 41.5%
- Space technology / astronomy 21.1%

7.1.21 Male respondents leaned more than female respondents towards areas of discovery (specifically, new inventions and technology [67.9%], new scientific discoveries [57.9%] and space technology/astronomy [33.5%]). Females showed more interest in the health

and environment area (specifically, health issues [81.3%], environmental issues [65.8%], weather/natural disasters issues [53.6%], medical and pharmaceutical issues [61.9%] and issues related to living organisms [47.1%]) (Figure 10).

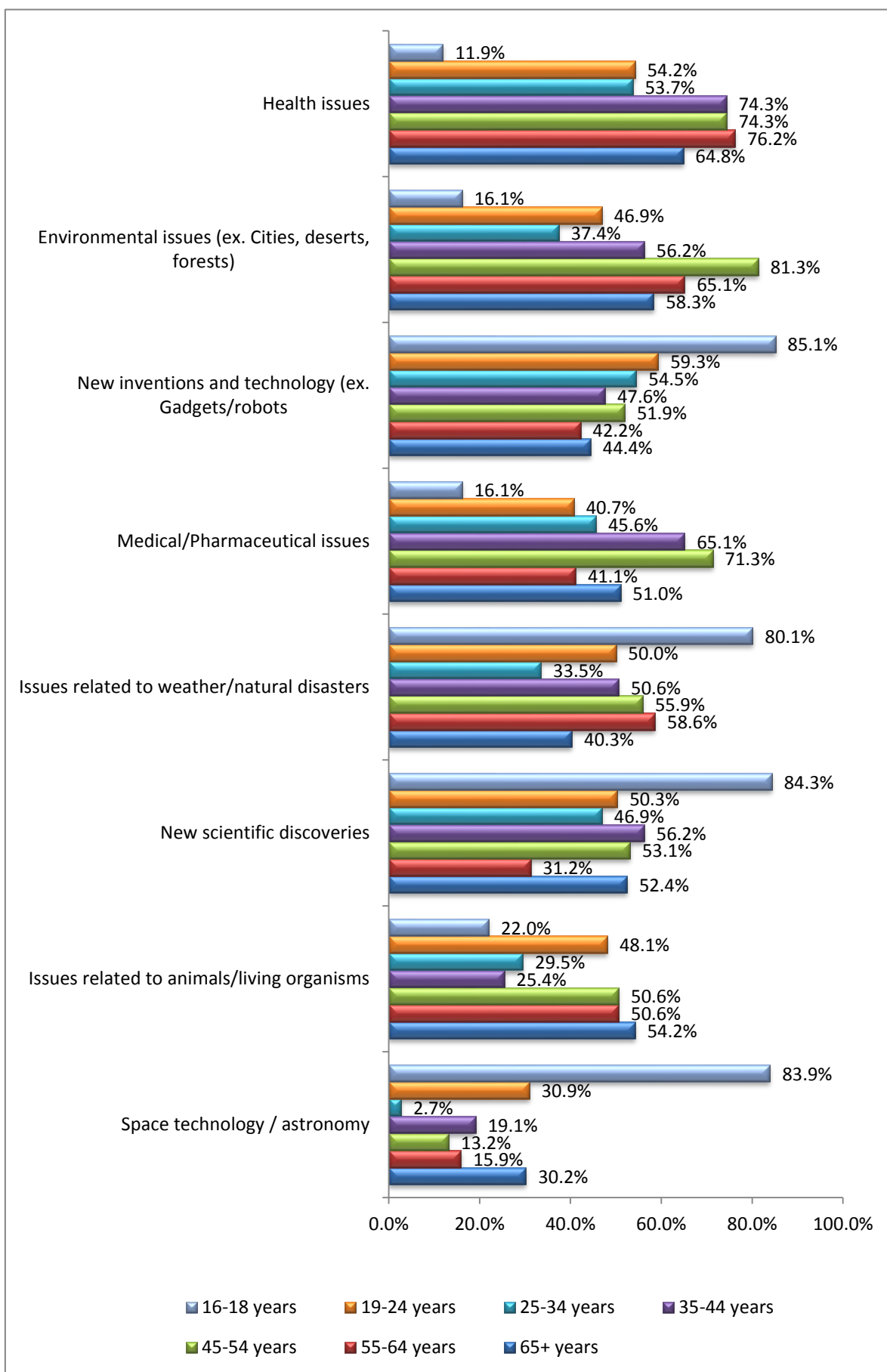
Figure 10 - Interest in area of science analysed by gender
Base: 199 respondents (interested in science)



7.1.22 The younger generation – particularly those aged 18 year or younger - were more likely to be interested in new inventions and technology, issues related to weather/natural disasters, new scientific discoveries and space technology/astronomy.

7.1.23 On the other hand, health issues were more likely to be a topic of significance for individuals aged 35 years and over, with those aged between 35 and 54 years giving specific focus to medical and pharmaceutical issues. Respondents aged 45 years and over were also more likely to show interest in environmental issues (Figure 11 overleaf).

Figure 11 - Interest in area of science analysed by age
Base: 199 respondents (interested in science)



7.1.24 Respondents believe that a more hands-on and interactive approach to science during school lessons (12.1%, 48 respondents), more emphasis on science in education (12.1%, 48 respondents) and the introduction of new laboratories (10.9%, 44 respondents) are the top three factors which would help people, especially youth, to foster an interest in science. The other factors mentioned by more than 2% of respondents are found in the table below.

Table 5 - Factors to help increase interest in science
Base: 400 respondents

Factors to help increase interest in science	%
A more hands-on/ interactive approach during school lessons	12.1%
More emphasis on science in school/education/modern schooling	12.1%
Introduce new laboratories (training and research centres)	10.9%
More courses/seminars/opportunities to learn	9.7%
Awareness programmes/ media	9.5%
Children's exposure to science from a young age (parent's involvement/approach towards science)	9.2%
Incentives when choosing studies for a science career	6.1%
Make science more interesting/fun	5.5%
Environmental awareness	4.0%
More emphasis on computer studies	2.8%
Internet (unspecified)	2.4%
Approach through social media (facebook)	2.4%
More science related activities / exhibitions	2.3%
Awareness about health through science	2.2%
Increase advertising	2.2%

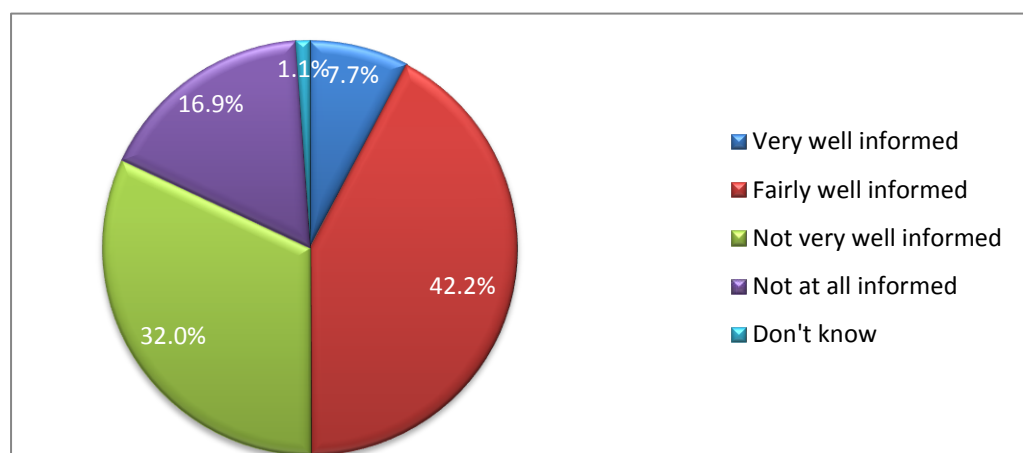
7.1.25 A large majority of respondents in the age group 16-18 years (72.6%) believe that a more hands-on approach would help increase interest in science.

7.1.26 When asked about how well informed they feel they are about science, about half of the respondents claimed to be *not very well* or *not at all informed* about this field (48.9%, 196 respondents) (*Figure 12 overleaf*). This is the same percentage as those who are not interested in science. Naturally, out of all respondents, those who lacked interest in the area of science were the more likely not to feel well informed. The opposite holds for those who claim to be interested in science.

7.1.27 The majority of respondents who claimed to be not well informed about science were also not interested in science, while the majority of respondents who claimed to be well informed about science were also interested in science.

7.1.28 Respondents aged between 16 to 18 years (91.6%) [2.944: p=0.000] and 19 to 24 years (65.4%) [2.756: p=0.004] were much more likely to be well informed about science when compared to the average results of the population² (49.9%; score – 2.412). On the other hand, those aged 55 years and older, were much less likely to be well informed (35.0% of 55-64 year olds; 30.1% of 65+ year olds [2.025: p=0.001]). Those who have a primary level of education [1.987: p=0.001], never attended school [1.000: p=0.000] or never studied science [1.600: p= 0.000] were the least likely to be well informed about science (23.3%, 0% and 13.3% respectively).

**Figure 12 - How well informed do you feel you are about science?
Base: 400 respondents**



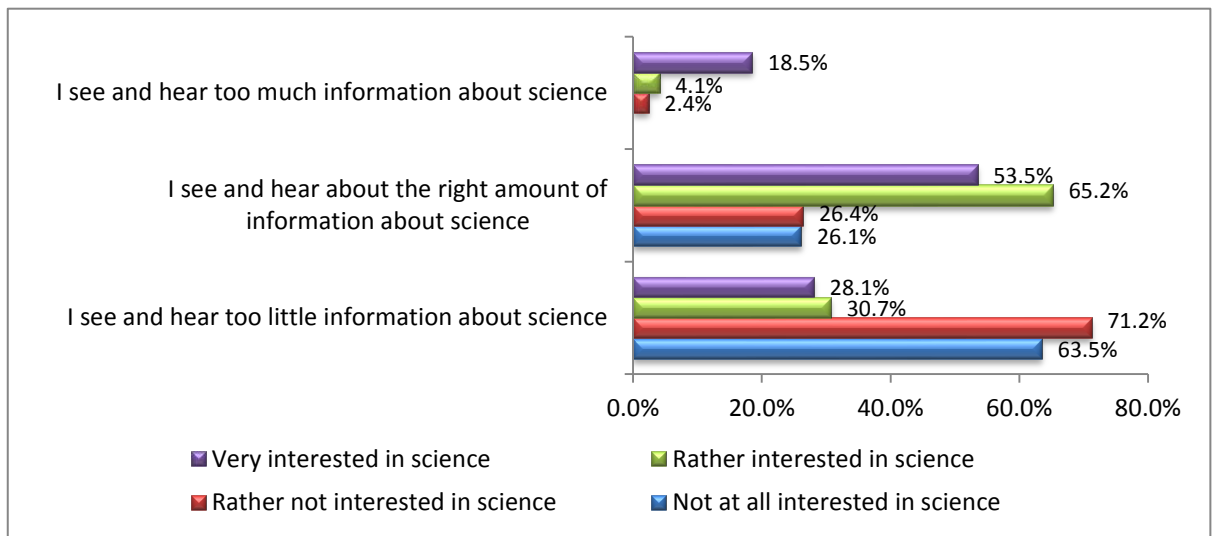
7.1.29 Those coming from Southern areas and Gozo were less likely to be well informed about science (Southern Harbour: 32.3% [2.169: p=0.019]; Southern Eastern: 45.5% and Gozo: 38.1%).

7.1.30 The same holds for those who are retired (34.3%), unemployed (31.3%), on home duties (36.9%) [2.134: p=0.003], have never worked in the science and technology industry (47.3%) or work full time on a voluntary basis (0%) [2.000: p=0.000], and coming from the lower socio-economic classes C2 (46.6%) and D/E (31.1%) [2.054: p=0.001].

² The average result of the general population is that shown in Figure 12

- 7.1.31 Males were more likely (51.6%) to be well informed about science than females who in their majority (51.2%) claimed to be *not very well informed* or *not at all informed* about science.
- 7.1.32 Interestingly, when asked whether they are exposed to too much, too little or about the right amount of information about science, most respondents claimed that they see and hear too little information (49.5%, 198 respondents) – This in line with what almost half of the interviewed respondents claimed, when they said that they are not well informed about the topic (48.9%) (*Figure 12*). A mere 5% claim to hear too much information while 43.5% maintained that they receive about the right amount of information on the subject.
- 7.1.33 The majority of respondents who mentioned that they receive too little information about science were also those who had previously claimed to feel *not very well informed* or *not at all informed* about science (68.1% - 135 out of 198 respondents). The converse holds as well in this regard.
- 7.1.34 It is also noteworthy that the absolute majority of 16-18 yr olds (92.6%) claimed to see and hear about the right amount of information about science and that a very large majority of people coming from the Southern Harbour claimed to see and hear too little information about science (74.4%).
- 7.1.35 The majority of respondents who mentioned that they receive too little information about the subject were also those who had previously claimed that they have little or no interest in science (67.3% - 134 out of 198 respondents). The converse holds as well in this regard. A noteworthy figure is that around 30% of respondents who had previously declared that they were rather or very interested in science also claimed that they see and hear too little information about the topic (59 out of 198 respondents) (*Figure 13*).

Figure 13 - Perception of amount of information received analysed by interest in science
Base: 400 respondents



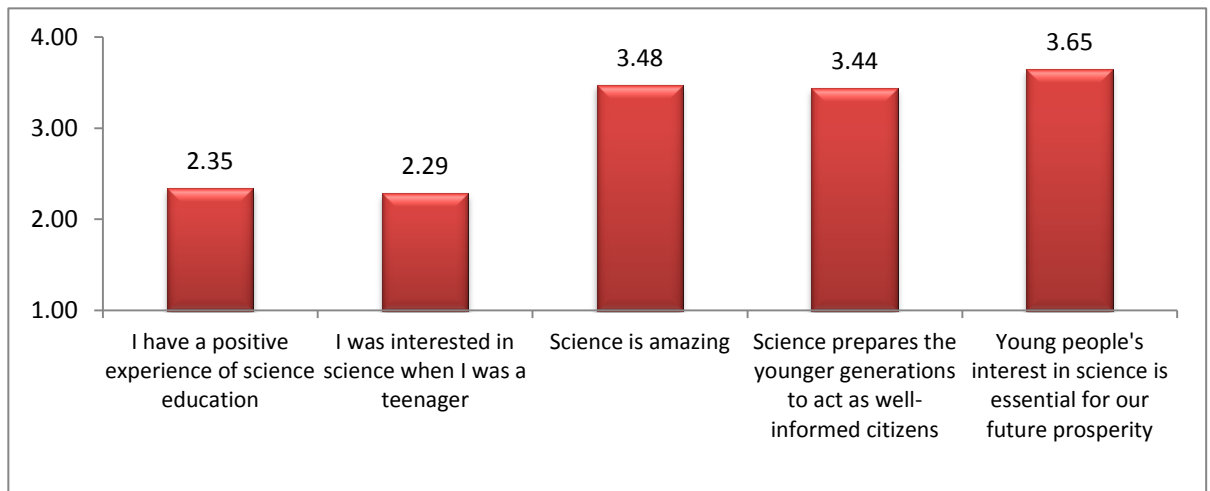
7.1.36 The majority of respondents with a level of education in science higher than secondary level claim to see and hear about the right amount of information about science.

7.1.37 Interestingly, the majority of respondents currently working in the Science and Technology industry also claim to see and hear too little information about science.

7.1.38 Respondents were presented with a list of statements about science and were asked to rate the extent to which they agree with them. Statements were rated on a 4-point scale where 1 meant that they strongly disagree and 4 meant that they strongly agree. The statements are featured in the list and in the graph below, together with the average score given to each statement:

- I have a positive experience of science education
- I was interested in science when I was a teenager
- Science is amazing
- Science prepares the younger generations to act as well informed citizens
- Young people's interest in science is essential for our future prosperity

Figure 14 - Perception towards science I
Base: 400 respondents



- 7.1.39 When compared to the average result of the whole population agreeing with the first statement (43.9%), young respondents – those aged between 19 and 24 years old were the most likely to give a positive rating to their experience of science education (65.8%) [2.756: $p=0.017$]. On the other hand, only 30.2 % of those aged 55-64 years and 34% of those aged 65+ gave a positive rating to their experience of science education, bringing down the average score to 2.030 [$p=0.014$] and 2.039 [$p=0.025$] respectively, showing their lack of agreement to these statements.
- 7.1.40 Males were more likely to have a positive experience of science education than their female counterparts.
- 7.1.41 Interestingly, the majority of respondents who reported to be interested in science reported having had a positive experience of science education. The converse also holds true. Moreover, the majority of those who carried on with their studies in science after secondary schooling also reported having had a positive experience of science education, more so than the average score [p-values range from 0.024 to 0.000].
- 7.1.42 The majority of respondents who reported to be not interested in science do not give a positive rating to their experience of science education. The converse also holds true in this regard.
- 7.1.43 The majority of respondents aged under 35 years report interest in science in their teenager years unlike the majority aged 35 years and over. In general, males (49.6%)

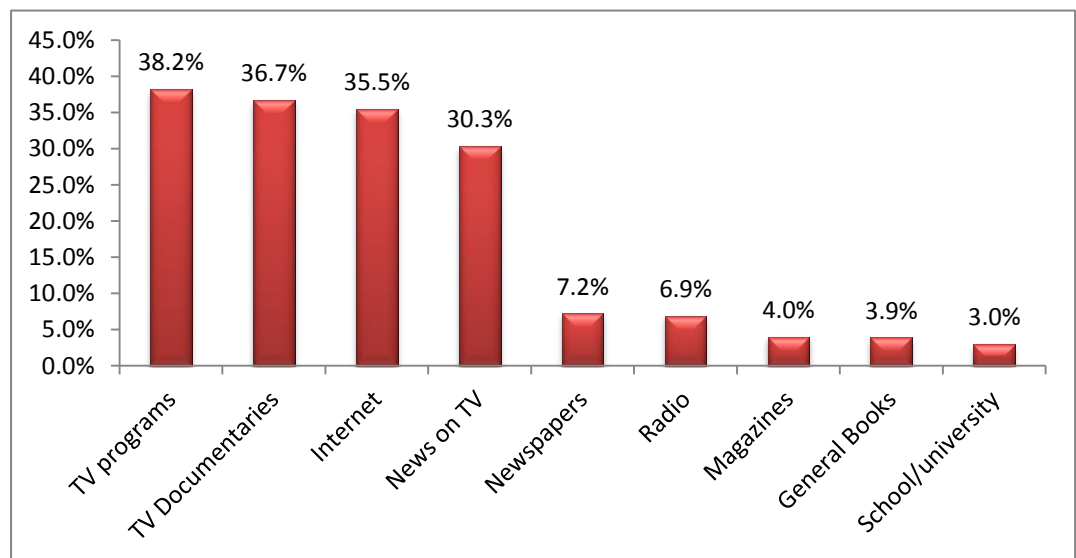
were more likely to have been interested in science than their female (38.3%) counterparts.

- 7.1.44 The majority of respondents who continued studying science after their secondary education, reported interest in science in their teenager years.
- 7.1.45 The majority of respondents who reported having had interest in their teenager years have maintained this interest in science and the majority of respondents who reported not being interested in science in their teenage years have also maintained this low level of interest. The converse also holds true in both cases.
- 7.1.46 The majority of respondents across all categories strongly believe that science is amazing, and agree with the positive effect of science on well informed youth and interest in science on future prospects.

SEARCHING FOR SCIENCE AND TECHNOLOGY-RELATED INFORMATION

- 7.1.47 Television and internet were the two most mentioned media on which respondents come across information about science and technology, when they are not actively searching for it.
- 7.1.48 Respondents less than 55 years of age (19-54) and respondents from higher socio-economic classes (A/B or C1) were more likely to mention internet as one of the two most mentioned media on which they come across information.

Figure 15 - Sources on which information about science and technology is come across
Base: 400 respondents



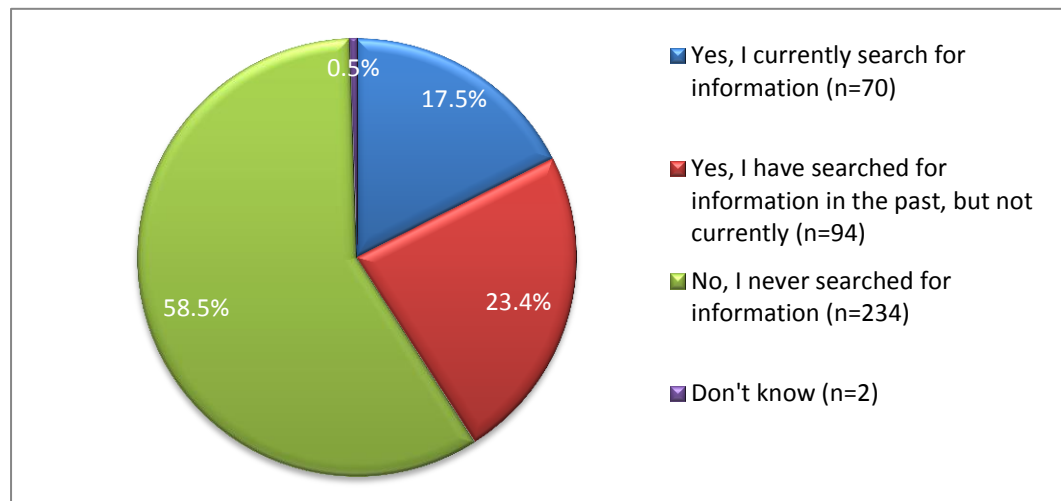
- 7.1.49 More specifically, those who come across science-related information on the internet, mentioned search engines (78.3%) and Facebook (22.9%) as the two primary sources for this. The rest of the sources identified by 3% or more of respondents are listed in the table overleaf.

Table 6 - Sources on which science-related information is come across
Base: 400 respondents

Source	%
Search engines (ex. Google)	78.3%
Facebook	22.9%
Science websites	7.7%
Wikipedia	7.6%
News Websites	7.1%
Blogs written by scientists or science commentators	5.4%
General websites	4.3%
You Tube	3.7%
Academic websites	2.5%

- 7.1.50 Individuals with no financially-rewarding activity (specifically, the retired, unemployed, those responsible for home duties and students) were more likely to come across science-related information on television (programs and documentaries). Individuals with a full-time activity, especially self-employed, were more likely to come across this information on the internet (54.9% and 87.4% respectively). The same generally holds for individuals with a level of education higher than that of a secondary level.
- 7.1.51 Individuals 55 years and older were more likely to encounter science-related information on the television and radio, while younger respondents (typically, those aged 34 and below) were more likely to mention the internet and television.
- 7.1.52 When specifically asked whether they have ever searched for information about science and/or technology, 40.9% claimed that they either currently search (70 respondents) or have searched for this type of information in the past (94 respondents), while 58.5% stated that they do not (*Figure 16 overleaf*). It is interesting to note that the majority of those aged 35 years up, and those with a secondary level of education or lower have never searched for information about science and/or technology.

Figure 16 - Actively searching for science-related information
Base: 400 respondents



7.1.53 Most of the 70 respondents who currently search for science-related information tend to do so on weekly basis or more often (32.3%, 23 respondents), but not on a daily basis.

7.1.54 The main reason cited for actively searching for science-related information is to increase general knowledge (38.2%, 27 respondents). Others mentioned that it is related to their work (17.2%, 12 respondents) or study (13.1%, 9 respondents) or due to their personal curiosity (13.1%, 9 respondents).

7.1.55 On the other hand, respondents who do not search or have never searched for information about science and/or technology (58.5%, 234 respondents), mainly cited the reason of no interest in the subject (59.3%, 139 respondents). This was followed by those who find science-related subjects difficult (13.0%, 30 respondents). The reasons which received two or more mentions are featured in Table 7.

Table 7 - Reasons for not searching for science-related information
Base: 234 respondents (do not search / have not searched for information about science and/or technology)

Reasons	%
Not interested in the subject	59.3%
Subject is too difficult	13.0%
Too busy to bother	7.5%
No particular reason	6.7%
My level of education is not very good	4.4%
Did not have access to research	1.7%
Don't know where to search	0.9%

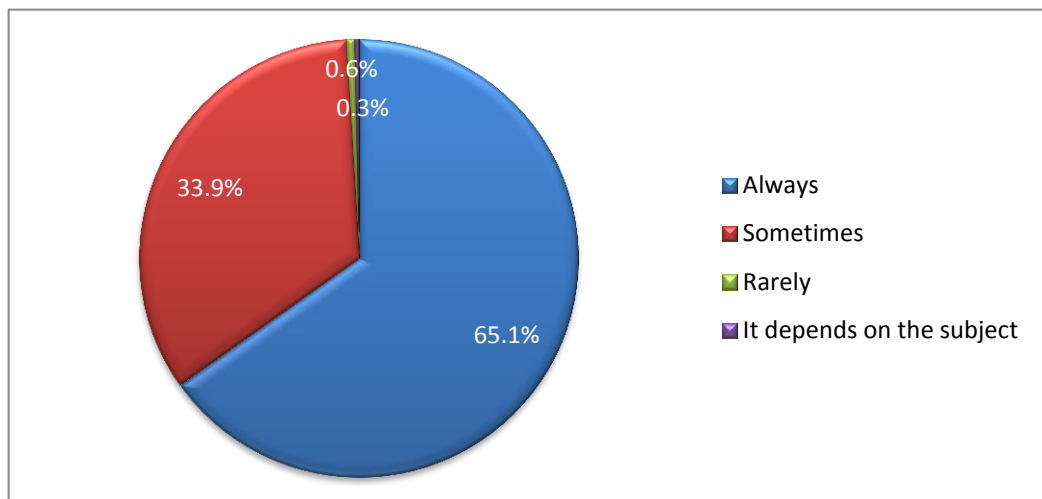
7.1.56 For respondents who do currently search for science-related information (70 respondents), the internet is by far the main source that the majority of respondents resort to, when they actively search for this type of information. In fact, more than three out of every five respondents who currently actively search for science-related information, chose this medium (*Table 8*). Specific focus was given to search engines – which were mentioned by more than half of the respondents who mentioned the internet as an information source (66.4%, 37 respondents) – and science websites (10.4%, 6 respondents). The rest of the internet sources received two mentions or less.

Table 8 - Sources used for actively searching for science-related information
Base: 70 respondents (currently actively search for information about science and/or technology)

Source	No. of mentions
Internet	55
TV programs	3
TV Documentaries	2
News on TV	2
Text books	2
General Magazines	2
Academic Journals	2
General Books	1
School/university	1

- 7.1.57 Respondents who currently actively search or have searched for information about science and/or technology in the past (164 respondents) were then asked whether they tend to generally find what they are/were looking for, when they actively search for information. Only one respondent mentioned that she rarely finds the kind of information that she is looking for, while another respondent stressed that this depends on the subject³.
- 7.1.58 Sixty-five percent of individuals claimed that they always find the information that they are or were searching for (107 respondents), while 33.9% said that sometimes they do, while sometimes they do not manage to find this information (56 respondents) (*Figure 17*).
- 7.1.59 The majority of respondents in the age brackets 55 - 64, 65+, those in the lowest socio-economic class D/E and those with a primary level of education or never studied science find some difficulty in finding the information they require when they look for it.

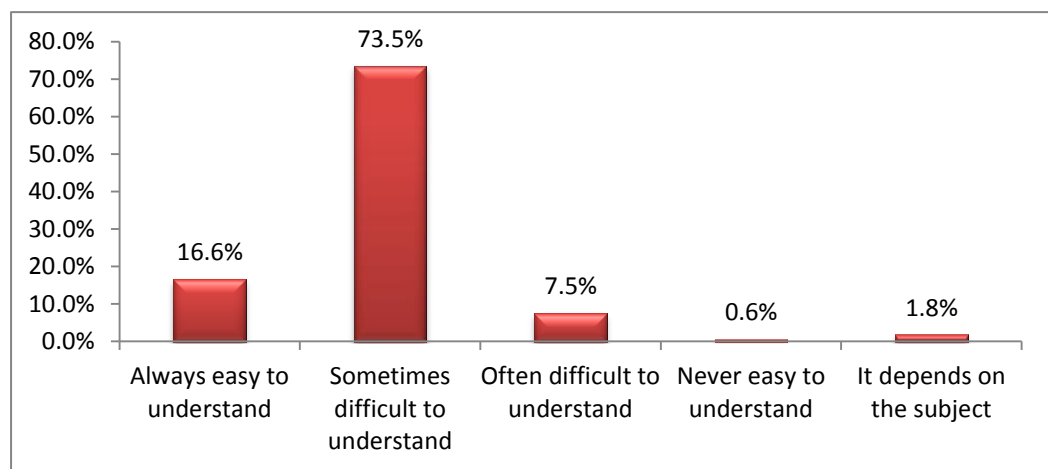
Figure 17- Ease of finding science-related information
Base: 164 respondents (currently actively search / have searched for information about science and/or technology)



³ When this respondent was asked to identify the subject that she was referring to, the respondent mentioned results of experiments.

7.1.60 The majority of respondents who currently actively search for science-related information or have done so in the past and generally find what they are looking for (163 respondents), feel that this information is *sometimes difficult to understand* (73.5%, 120 respondents), while 7.5% believe that this information is *often difficult to understand* (12 respondents). Only 16.6% of individuals claim that this information is *always easy to understand* (27 respondents) (Figure 18).

Figure 18 - Understandability of science-related information found
Base: 163 respondents (currently actively search / have searched for information about science and/or technology; generally find what they are/were looking for)



7.1.61 Surprisingly, 24.8% of those having a doctorate level of education in science find science *never easy to understand*.

7.1.62 Respondents finding science *often difficult to understand* are more likely to come from the Southern harbour areas.

7.1.63 Respondents were then asked about their awareness of Maltese science researchers. There seems to be a great lack of awareness in this area, as three quarters of respondents (74.3%, 297 respondents) were unable to identify any particular Maltese science researchers when asked to do so. When compared to the average result of the whole population, the most likely to be in this category were those aged 16 to 18 years (93.4%), those unemployed and responsible for home duties (82.8%) and those belonging to the D/E socioeconomic classification (82.0%).

7.1.64 The majority of respondents who have a secondary level of education (83.9%), never attended school (100%), never studied science (85.6%), and coming from areas in the Southern Harbour (86.6%) or Gozo region (86.1%) also fall in this category.

7.1.65 Out of those respondents who were able to identify an individual, the one which received the most mentions was Sir Temi Zammit (10.3%, 41 respondents). Other names mentioned include Dr Marco Cremona (4.2%, 17 respondents) and Dr. Ing. Nicholas Sammut (3.4%, 13 respondents) – albeit being mentioned by a far smaller number of respondents. The following is a list of individuals mentioned by at least 1 respondent.

Table 9 - Individuals considered being Maltese science researchers
Base: 400 respondents

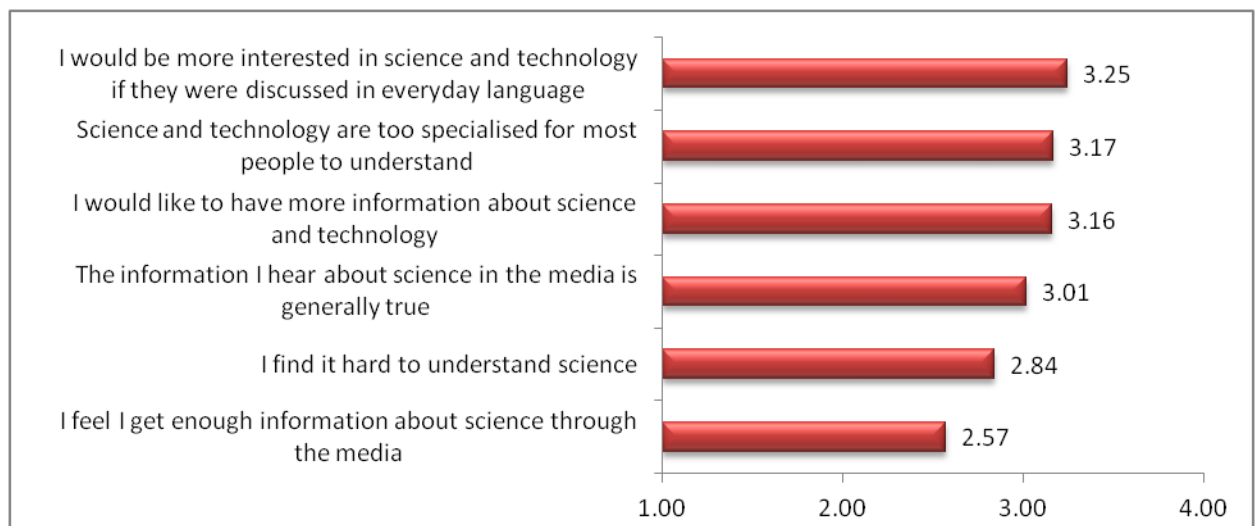
Individual identified	No. of mentions
Sir Temi Zammit	41
Marco Cremona	17
Dr. Ing. Nicholas Sammut	13
Prof. Richard Muscat	5
Dr Ernest Azzopardi	3
Dr Grima	2
Dr Buttigieg	2
Peter Serracino Inglott	2
Profs Alfred Vella	2
Dean Debono	1
Dr Bianco	1
Emmanuel Scerri	1
George Pisani	1
Prof Azzopardi	1
Annalise Xuereb	1
Dr Bernard Coleiro	1
Dr Noel Debono	1
Dr Pierre Schembri Wismayer	1
Mr Matrenza	1
Nicholas Portelli	1
Pippo Psaila	1
Prof Robert M Borg	1
Profs Alex Felice	1
Charles Farrugia	1
Dr Deo Debattista	1
Dr Zarb	1
Prof Debono	1

7.1.66 Once again, respondents were presented with a list of statements about science and were asked to rate the extent to which they agree with them. Statements were rated on a 4-point scale where 1 meant that they strongly disagree and 4 meant that they

strongly agree. The statements are featured in the list and in the graph further below, together with the average score given to each statement:

- I feel I get enough information about science through the media
- I would be more interested in science and technology if they were discussed in everyday language
- The information I hear about science in the media is generally true
- I would like to have more information about science and technology
- I find it hard to understand science
- Science and technology are too specialised for most people to understand

Figure 19 - Perception towards science II
Base: 400 respondents



7.1.67 Most respondents are concerned with the language used when the subject of science and technology is discussed. In fact, 64.8% of respondents said that they find it hard to understand science, 79.3% of respondents stated that they would be more interested in science and technology if they were discussed in everyday language and 79.4% of respondents stated that science and technology are too specialised for most people to understand. However, there is a general interest in this field, with 77.6% of respondents claiming that they would like to have more information about science and technology.

7.1.68 The majority of those who are not interested in science or do not feel well informed about science, find science hard to understand. Moreover, the converse also holds: the majority of those who find it hard to understand science are not interested in science and do not feel well informed about science.

- 7.1.69 With regards to age and level of education, a large percentage of respondents in the age bracket 16-18 years (84.5%) and those with a primary level of education (84.6%) [3.313: p=0.000] find it hard to understand science.
- 7.1.70 More females (67.1%) than males (62.5%) find science hard. The majority of females (80.9%) also believe that science and technology are too specialised for most people to understand compared to males (77.8%).
- 7.1.71 As expected, the majority of respondents with a level of education equal to that of a bachelor degree or above find science easy to understand [p-value range from 0.027 to 0.001].
- 7.1.72 A larger majority of females (88.5%) [3.449: p=0.003] compared to males (70%) would be more interested in science and technology if they are discussed in everyday language. Moreover, the majority of respondents who had shown lack of interest in science and feel not well informed about science also agree that simpler language would make them become more interested in science. Thus it seems that the number of interested people could potentially increase should simpler language be used.
- 7.1.73 A staggering 44.8% of respondents in the age group 16-18 years claim that simpler language will not make them more interested in science [2.667: p=0.001].
- 7.1.74 Respondents seem divided over whether they get enough information about science through the media. In fact, just 50.7% agree with the statement. The largest percentage of respondents who agree with the statement in the different categories are those in the age group 25-34 years (65.8%) [2.871: p=0.017], females (58.3%), those on home duties (58.6%), those in the highest social- economic class A/B (57.5%) and those with a doctorate level of education (83.2%) and in science in particular (100%).
- 7.1.75 The less interest in science that the respondents have, and the less well informed they feel, the smaller the percentage of those who feel that they get enough information about science through the media.
- 7.1.76 The majority of respondents (66.9%) agree that information about science on the media is generally true. Among the lowest percentage of respondents who agree to this are those in the age group 16-18 years (23.6%) [2.278: p=0.000], those who attended College education (22%), those having a Primary level of education (50%), students

(49.7%) [2.615: $p=0.001$] and those who have worked in the Science and Technology industry in the past (48.2%) [2.522: $p=0.007$].

- 7.1.77 The less interest in science that the respondents have, and the less well informed they feel, the smaller the percentage of those who feel that the information they hear about science in the media is generally true.
- 7.1.78 The largest percentage of respondents who would like to have more information about science are those coming from Gozo (90%), those who have worked (92.1%) [3.478: $p=0.029$] or currently work in the science and technology industry (91.9%) [3.455: $p=0.018$], those in the age group 25-34 years (93.3%) [3.471: $p=0.000$], those self-employed (95.9%) [4.000: $p=0.000$] and working on a voluntary basis (100%) [4.000: $p=0.000$], those with a masters level of education (97.9%) [3.818: $p=0.000$], and those having a diploma, post-graduate, master [4.000: $p=0.000$] or doctorate in science.
- 7.1.79 Interestingly, the majority of the respondents who had claimed to be not interested in science or not to be well informed about science would still like to have more information about science and technology.

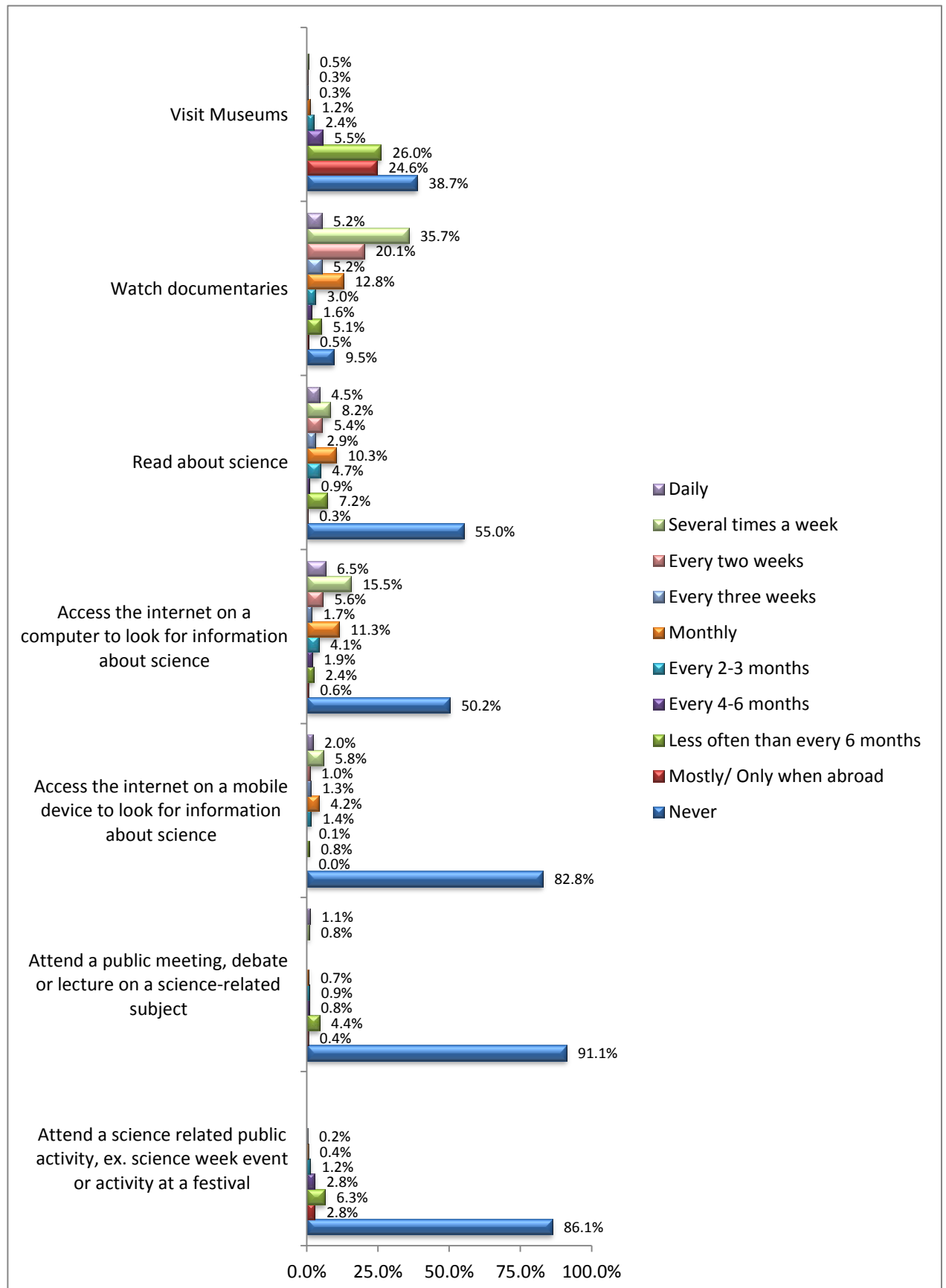
AWARENESS AND PARTICIPATION AT SCIENCE-RELATED EVENTS

- 7.1.80 This section of the questionnaire focused on science-related activities that respondents have participated in or that they potentially might show interest in.
- 7.1.81 Respondents were read out the following list and were asked to identify the frequency of carrying out each of these activities:
- Visit Museums
 - Watch documentaries
 - Read about science
 - Access the internet on a computer to look for information about science
 - Access the internet on a mobile device to look for information about science
 - Attend a public meeting, debate or lecture on a science-related subject
 - Attend a science related public activity, ex. science week event or activity at a festival
- 7.1.82 The activity which is carried out most often is watching documentaries (40.9% watch documentaries daily and up to several times a week). On the other hand, reading about science (55.0%), attending public meetings and events on science-related topics⁴ and accessing the internet to look for science-related information – whether on a computer (50.2%) or a mobile device (82.8%), were the activities which most respondents have never engaged in. Museums were visited for the most part either less often than every 6 months (26%) or when respondents are abroad (24.6%) (*Figure 20 overleaf*).
- 7.1.83 It is interesting to note that the older the respondents were, the higher the percentage of those who never engaged in reading about science, and accessing the internet on a computer to look for information about science.
- 7.1.84 A large percentage of respondents in the age bracket 45+, with a secondary level of education or lower, who are retired (70.7%), unemployed (68.4%), on home duties (67.1%), work on a voluntary basis (100%), in the socio-economic classes C2 (65%) and D/E (63.2%) and coming from areas in the Southern Harbour (64.9%), Southern Eastern (62.5%) and Gozo (60.3%) region never read about science.

⁴ 86.1% of respondents claimed that they never attend science related public activities and 91.1% claimed that they never attend public meetings, debates or lectures on a science-related subject

- 7.1.85 A larger percentage of females (55.5%) compared to males (54.6%) never read about science. A larger percentage of females compared to males also never access internet for info on their computer or on their mobile phone and attend public meetings on a science-related subject. On the other hand a larger percentage of males (86.9%) compared to females (85.4%) have never attended a science public activity.
- 7.1.86 The lower the socio-economic class, the higher the percentage of respondents who have never accessed the internet on a computer to look for information about science, visited museums, or attended a science related public activity.
- 7.1.87 It is interesting to note that 92.4% of respondents who say to be rather interested in science and 67.2% of respondents who are very interested in science have never attended a public meeting, debate or lecture on a science-related subject. Neither have 84.3% of respondents who say to be rather interested in science and 61% of respondents who are very interested in science have ever attended a science related public activity.
- 7.1.88 Respondents who previously maintained that they were not interested in science or do not feel well informed about science were the least likely individuals to have participated or engaged in any of these activities.

Figure 20 – Frequency of science-related activities engaged in
Base: 400 respondents



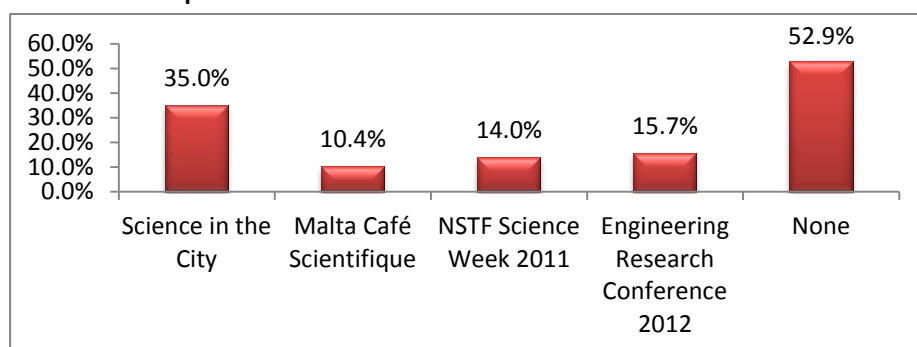
7.1.89 Respondents were presented with four main science and technology-related public events and asked which of them they have heard of. The events included:

- Science in the City
- Malta Café Scientifique
- NSTF Science Week 2011
- Engineering Research Conference 2012

7.1.90 Slightly more than half of the respondents stated that they have never heard of any of them (52.9%, 212 respondents). These respondents tended to be those aged 55 years and over⁵. They were more likely to have never studied science (71.8%), be males (56.0%), coming from Gozo region (70.1%), belonging to the C2 (71.7%) and D/E (54.3%) socioeconomic classes, those with a primary level of education (77.8%) or lower, working on a voluntary basis (100%), retired (66.1%) or responsible for home duties (61.6%). Then, there were those who have never worked in the Science and Technology industry (56.9%), those who are not at all interested in science (79.4%) and those who feel not very (57.4%) or not at all (72.7%) informed about science⁶.

7.1.91 Science in the City was the event that most respondents were aware of (35.0%, 140 respondents). These were more likely to be coming from Northern regions (47.9%), females (39.2%), those aged between 19 and 24 years old⁷, those forming part of the higher socioeconomic classes – A/B (59.7%), those with a high level of education, those having an interest in science⁸ and those claiming to be very (42.7%) or fairly (44.5%) informed about the topic⁹.

Figure 21 - Awareness of science and technology-related public events
Base: 400 respondents



⁵ 61.6% of 55-64 year olds; 70.5% of 65+ year olds

⁶ Comparisons are made to the average result of the general population shown in Figure 21

⁷ 54.5% of 19-24 year olds

⁸ 40.6% of those rather interested in science; 44.6% of those very interested in science

⁹ Comparisons are made to the average result of the general population shown in Figure 21

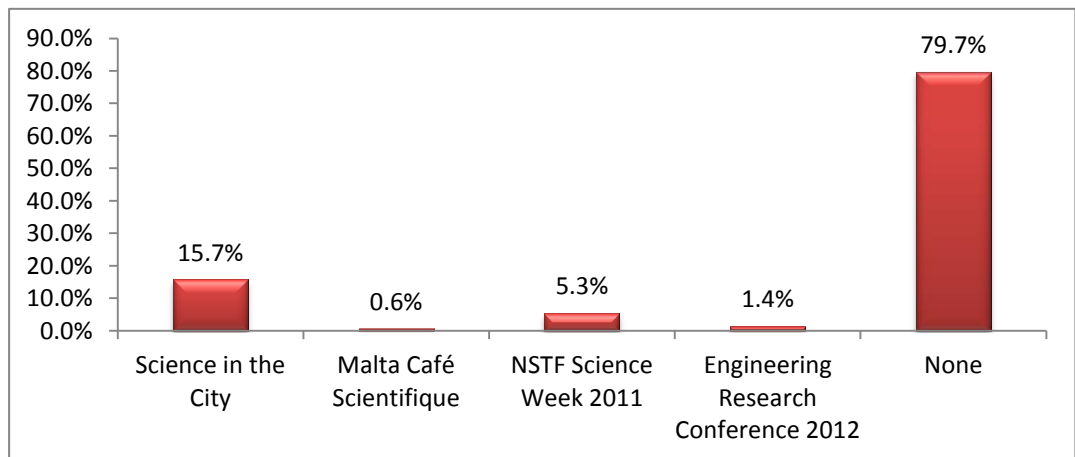
7.1.92 Respondents who were aware of any of the aforementioned science-related events, were then asked whether they have actually attended any of them. Once again, the majority of respondents said that they did not take part in these events (79.7%, 150 respondents) and those who did, mentioned Science in the City the most (15.7%, 30 respondents) (Figure 22).

7.1.93 98.7% of those on home duties and a larger percentage of female respondents (81.4%) compared to males (77.7%) have never visited the activities or events mentioned. The lower the social-economic class and the lower the level of education, the higher the percentage of those who never visited such events.

7.1.94 The age group which has the largest percentage of visitors is 19-24yrs (37.2%).

7.1.95 Respondents who previously maintained that they were not interested in science or do not feel well informed about science were the least likely individuals to have visited such events.

Figure 22 - Participation in science and technology-related public events
Base: 188 respondents (have heard of the listed science and technology-related public activities or events)



7.1.96 The main reason why respondents took part in these events was because they find them interesting (61.9%, 24 respondents), followed by those who participated due to their children’s or grandchildren’s interest (9.4%, 4 respondents). The rest of the reasons for attending these events were mentioned by three respondents or less.

- 7.1.97 Respondents who have heard of the above science and technology-related public activities or events, and have visited or taken part in one or more of these activities or events, were asked whether they believe there are other science and technology-related activities or events that could be organized.
- 7.1.98 Slightly more than one in every three respondents could not identify any other specific events (36.0%, 14 respondents), while out of those who did, most mentioned a more hands-on approach to science at school for children (4 respondents). The rest of the suggested activities mentioned by at least one respondent, are featured in the table below (*Table 10*).

Table 10 - Suggested science or technology-related events to be organised
Base: 38 respondents (have heard of the listed science and technology-related public activities or events; have visited or taken part in one or more of these activities or events)

Activity	No. of mentions
More hands-on science for children	4
School involvement in events	4
Science events should be organised more often	4
More inexpensive exhibitions	2
School projects should be open to the general public	2
Seminars / public conferences	2
More activities similar to science in the city	1
Events that are related to Maltese geography	1
More interactive activities	1
Science in the city should be more interactive	1
Science in the city should be more scientific	1
ICT events should be organised more often	1
Science in the city should be held more often	1
More experiments	1
Activities related to health	1
Science activities organised on a local / parish level	1
Opening science museums	1

- 7.1.99 There is a general belief among respondents that science and technology improve society. When asked to rate their agreement to this notion on a 4-point scale, where 1 meant that they strongly disagree and 4 meant that they strongly agree, 95.3% of respondents gave a score of 3 and 4. The statement received an average score of 3.71 out of a possible maximum score of 4. Nevertheless, as already observed, there is a general lack of engagement in related events organised and active searching for science-related information.
- 7.1.100 Compared to the average score obtained by the respondents of 3.710, the lowest scores were obtained by the age group 16-18 yrs old (3.444) [p=0.034] and older than 65 (3.539), those with a post-secondary level of education (3.467), those who are self-employed (3.500), those having attended College (3.000), those who never studied science (3.071) [p=0.000], those who never attended school (1.000) [p=0.000] and those coming from areas in the South Eastern region (3.426) [p=0.028].

SCIENCE AND THE GOVERNMENT

7.1.101 This section of the questionnaire dealt with the topic of science and issues related to authority and government.

7.1.102 Respondents were first asked who they think is the best qualified person and/or organisation to explain the impact of scientific and technological advancements to the public. More than two out of every three respondents (68.7%, 275 respondents) feel that this should be done by scientists, followed by science commentators (40.3%, 161 respondents). The table below lists, in descending order, the individuals or organisations which respondents feel are the best qualified persons and organisations to explain the impact of scientific and technological advancements to the public.

Table 11 - Best qualified person and organisations to explain the impact of scientific and technological advancements

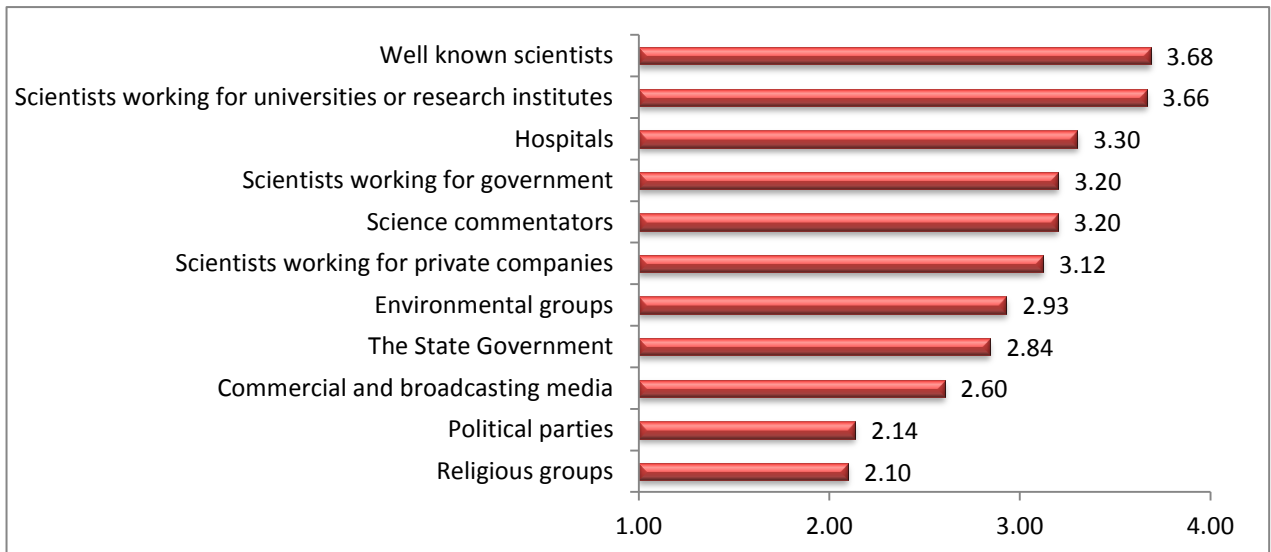
Base: 400 respondents

Individual/Organisation	%
Scientists	68.7%
Science commentators	40.3%
Commercial and broadcasting media, including newspapers, TV, radio	39.6%
Environmental groups	36.8%
Hospitals	34.4%
The State Government	29.2%
Religious groups	10.8%
Political parties	8.9%
Teachers	1.1%
Educational department	0.9%
Engineers	0.6%
Local councils	0.4%
Family members	0.2%

7.1.103 Respondents were then asked to rate their trust in various persons and organisations when it comes to them divulging science and technology information to the public. Each person/organisation was rated on a 4-point scale where 1 meant no trust at all and 4 meant a great deal of trust towards the scientific and technological information that these parties communicate.

7.1.104 Individuals working in the science industry are considered to be the most trustworthy source to pass on scientific and technological information - being given a score of 3.12 or higher out of a possible score of 4 - whereas political parties (2.14 out of a possible score of 4) and religious groups (2.10 out of a possible score of 4) are the least trusted.

Figure 23 - Most trusted sources for scientific and technological information
Base: 400 respondents



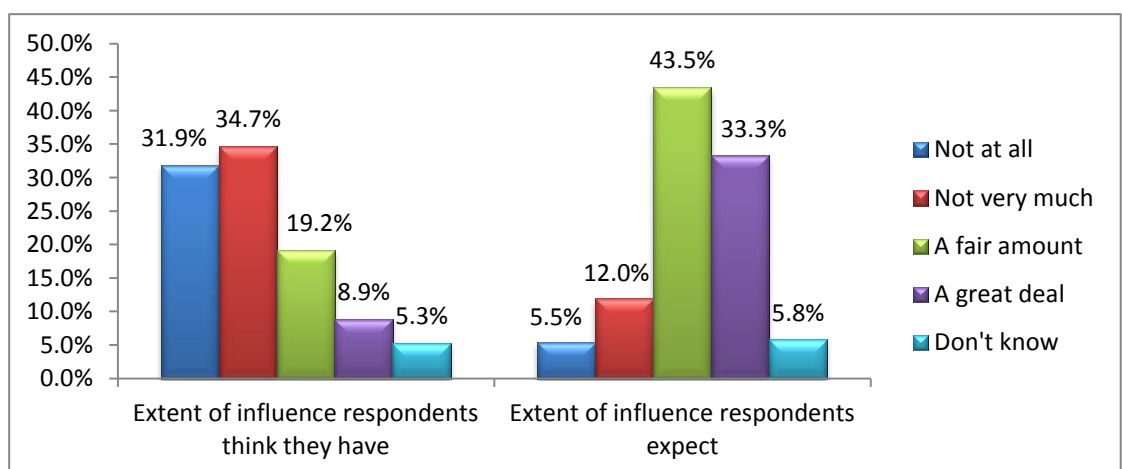
7.1.105 Well known scientists or scientists working for universities or research institutes are the most trusted out of all scientists, obtaining a score of 3.68 and 3.66 respectively.

7.1.106 The reason why respondents tend to trust some and not others to relay this type of information is because they are experts in their field (22.0%, 85 respondents), while other respondents mentioned that many entities are after their own benefit (16.1%, 62 respondents).

7.1.107 Respondents were also asked about their perception on the extent of their influence on laws about scientific issues. They were asked to rate how much they believe they have influence on these types of laws on a 4-point scale, where 1 meant no influence at all and 4 meant a great deal of influence. Further to this, they were also asked to identify the extent of influence which they would like to have on these same laws.

- 7.1.108 In the former case, respondents reported that they have little influence on laws about scientific issues, with two-thirds of respondents (66.6%, 267 respondents) giving a score of 1 (no influence at all) and 2 (not a lot of influence) on a possible score of 4. However, respondents would like the state of their current influence to increase – 76.8% (307 respondents) of respondents claimed that they would like a fair amount or a great deal of influence in such cases (Figure 24).
- 7.1.109 It is interesting to note that quite a large percentage of respondents aged 16-18 years (47.5%) feel that they shouldn't have much influence on laws on scientific issues that are important to them.
- 7.1.110 The higher the level of education of the respondents, the more influence respondents feel they should have. Moreover, a larger percentage of females (80.8%) compared to males (72.5%) would like to have influence on laws on scientific issues that are important to them.
- 7.1.111 When compared to the average result of the general population, it was even those respondents who had previously claimed to have no interest at all in science (62.2%) and those who feel not at all informed about scientific matters (58.6%), that desired a level of influence (a fair amount / a great deal) on laws about scientific issues¹⁰.

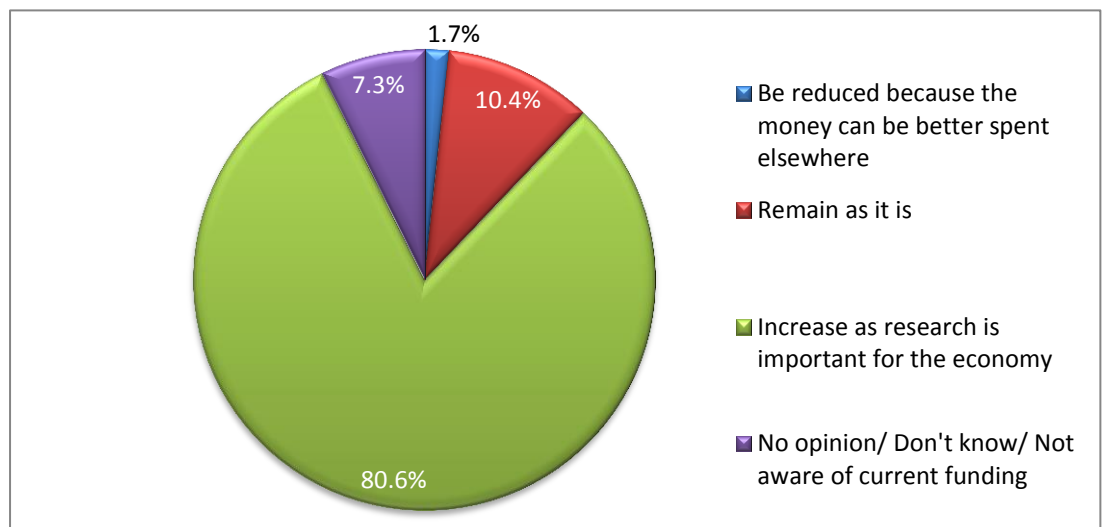
Figure 24 - Perceived and desired level of influence on laws about scientific issues
Base: 400 respondents



¹⁰ Comparisons are made to the average result of the general population shown in Figure 24

7.1.112 In general, the majority of respondents believe that Government funding for science research should increase, as research is important for the economy (80.6%, 322 respondents) (Figure 25).

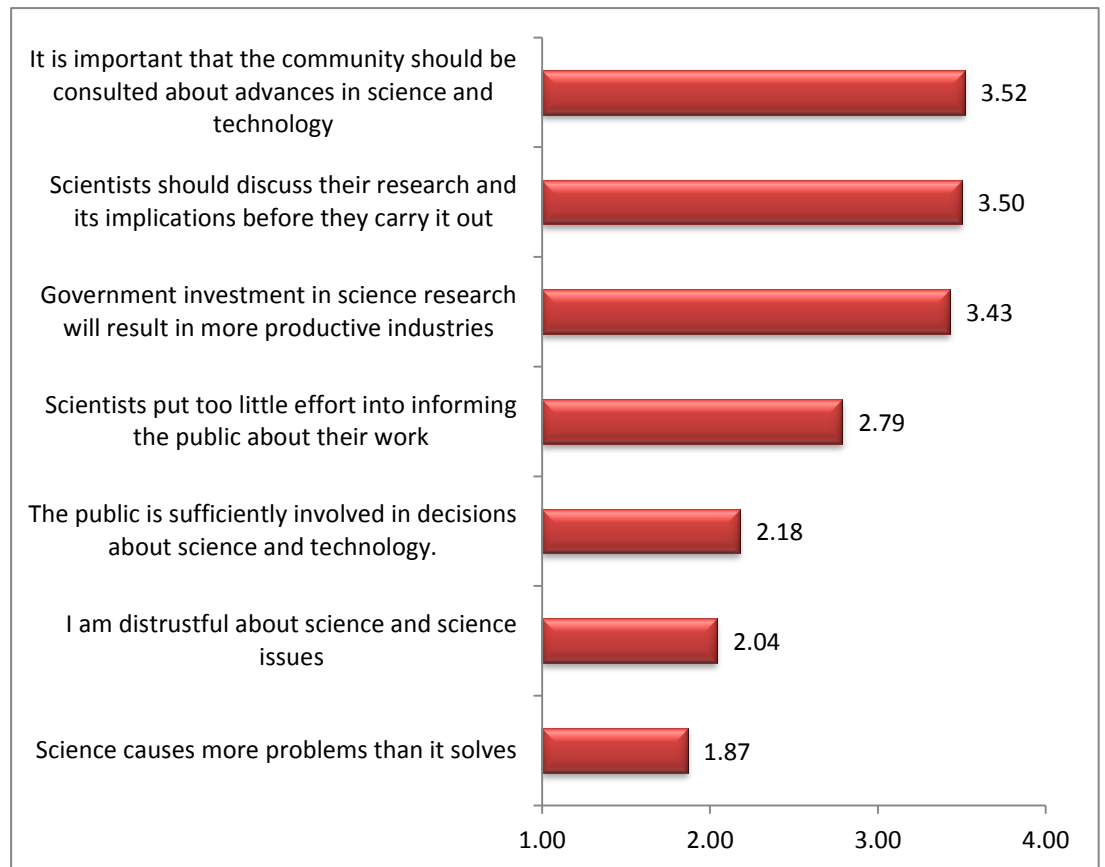
Figure 25 - Do you think that Government funding for science research should...
Base: 400 respondents



7.1.113 At the end of the questionnaire, respondents were again presented with a list of statements about science and awareness of the public about advancements in this area, and were asked to rate the extent to which they agree with each of these statements. Statements were rated on a 4-point scale where 1 meant that they strongly disagree and 4 meant that they strongly agree. The statements included:

- Science causes more problems than it solves
- It is important that the community should be consulted about advances in science and technology
- I am distrustful about science and science issues
- Government investment in science research will result in more productive industries
- The public is sufficiently involved in decisions about science and technology
- Scientists put too little effort into informing the public about their work
- Scientists should discuss their research and its implications before they carry it out

Figure 26 - Perception towards science III
Base: 400 respondents



7.1.114 The statements which respondents agree most strongly with, are those pertaining to consulting the public about advancements in the area of science (3.52 out of a possible score of 4) and the discussion of scientific research and its implications (3.50 out of a possible score of 4).

7.1.115 The majority of respondents (70.1%) disagree with the statement ‘Science causes more problems than it solves.’ The smallest percentages who disagree are those with a primary level of education (58.4%), those who never studied science (58.5%), the unemployed (48.7%), those in the age brackets 16-18 years (56.6%) and 55-64 years (59.5%) and those coming from Northern regions (57.1%). Interestingly, a larger percentage of females (26.4%) compared to males (22.5%) agree with this statement.

7.1.116 The majority of respondents (86%) agree that the community should be consulted about advances in science and technology. The smallest percentage who agree are those in the age bracket 16-18 years (55.3%) [2.944: p=0.011]. Interestingly, a larger percentage of females (89.1%) compared to males (82.9%) agree with this statement.

- 7.1.117 The majority of respondents (65%) are not distrustful about science and science issues. However, the low value given to it is worrying especially since 43.3% of respondents aged 16-18 years old are distrustful of science. Those in the age group 45-54 years (38.6%), those who never studied science (37.1%) [2.677: $p=0.000$], those with a Higher National Diploma (61.9%) and those who are retired (41.5%) [2.463: $p=0.001$] also have a large percentage of respondents showing their distrust towards science.
- 7.1.118 In line with what was discussed previously, only 28% of respondents agree that the public is sufficiently involved in decisions related to science and technology. The lowest percentage of respondents who agree with the statement are those coming from the South Eastern (14.6%) and Western (17.5%) region. Interestingly, the large majority of those with a Masters and Doctorate in science (79.5%; 52.4%) agree with the statement.
- 7.1.119 In fact, the majority of respondents (87.4%) agree that scientists should discuss their research and its implications before they carry it out. The majority, although on a smaller scale (59.3%) also feel that scientists put too little effort into informing the public about their work. A larger percentage of males (65.5%) compared to females (53.2%) feel that this is the case.
- 7.1.120 In continuation with respondents' positive views regarding government funding for science research improving the economy, respondents also believe that government investment in science research will result in more productive industries (3.43 out of a possible score of 4).

CONCLUSION

- 8.1 Results show that there is a general interest in the field of science, with 78% of respondents claiming that they would like to have more information about science and technology. However, most respondents are concerned with the language used when the subject of science and technology is discussed. In fact, most respondents said that they find it hard to understand science, that they would be more interested in science and technology if they were discussed in everyday language and that science and technology are too specialised for most people to understand.
- 8.2 Respondents see the importance of science, both in everyday life and for future prosperity, however they lack engagement with the subject. Respondents either have a passive interest in the subject – coming across information mostly on television – or have an interest in the subject because of academic reasons.
- 8.3 Television seems to be the most appropriate medium to informally inform and educate the public about science and technology, while the internet can be used for more targeted information-giving.
- 8.4 There is a general lack of awareness and participation for science-related events organised.
- 8.5 There is a general belief among respondents that science and technology improve society and the majority of respondents believe that Government funding for science research should increase, as research is important for the economy.
- 8.6 They also believe that the public should be more involved in laws related to scientific issues, and should be better informed about advancements in the area of science and the implications of these advancements.
- 8.7 With regards to general population interest in science, noteworthy differences were found between the overall mean score and certain groups in society, as explained in Chapter – Interest in Science. Further to this, when compared to the average results of the population, statistical significance was also found in the lower interest in science of those aged 65+ years [$p=0.001$], those who work full time on a voluntary basis [$p=0.000$], those coming from the Southern Harbour areas [$p=0.044$], those with a primary level of education [$p=0.017$] or who never attended school [$p=0.000$].

- 8.8 A higher interest in science than the overall mean score of the general population by the A/B socioeconomic class [p=0.006], those who are currently working in the science and technology industry [p=0.000], those coming from the Northern Harbour areas [p=0.013] and those who have a post-secondary level of education and higher [p-value ranges from 0.042 to 0.000], was also found to be statistically significant.
- 8.9 Interesting observations were also made with regard to how informed the general population is about science (see chapter - Interest in Science). A statistical significant difference was found in the higher proportion of well informed individuals who form part of the 16 to 18 year [p=0.000] and 19 to 24 year [p=0.004] age groups. On the other hand, those aged 65 year old and over [p=0.001], those having a primary level of education [p=0.001], never attended school [p=0.000] or never studied science [p=0.000], those on home duties [p=0.003] or work full time on a voluntary basis [p=0.000], those living in the Southern Harbour [p=0.019] and coming from the D/E socio-economic class [p=0.001] were statistically significantly less likely to be informed about science.
- 8.10 Respondents aged between 19 and 24 years old [p=0.017], together with respondents who carried on with their studies in science after secondary schooling [p-values range from 0.024 to 0.000], were the most likely to give a statistically significant positive rating to their experience of science education; while those aged 55-64 years [p=0.014] and those aged 65+ [p=0.025] gave a statistically significant less positive rating than the overall mean score of the general population.
- 8.11 A statistical significance was also found in the higher proportion of respondents with a level of education equal to that of a bachelor degree or above, who find science easy to understand [p-value range from 0.027 to 0.001], and the lower proportion of respondents with a primary level of education [p=0.000] who find it harder to understand science when compared to the overall population.
- 8.12 When compared to the overall population, the larger proportion of respondents who would like to have more information about science was statistically significant for those in the age group 25-34 years [p=0.000], those self-employed [p=0.000] and working on a voluntary basis [p=0.000], and those with a masters level of education [p=0.000].

- 8.13 With regards to the belief of the improvement of society through science and technology, when compared to the average score obtained by the respondents, the lower mean scores obtained by the age group 16-18 yrs old [$p=0.034$], those who never attended school or studied science [$p=0.000$], and those coming from areas in the South Eastern region [$p=0.028$] were statistically significantly different.

RECOMMENDATIONS

- 9.1 Simpler and more colloquial language could be used when discussing science and technology-related topics and subjects discussed should relate to everyday life. This helps individuals relate to the topic and apply their understanding to practice, thus allowing learning and increasing of knowledge.
- 9.2 There is room for more science-related activities and events to be organised. Better exposure and marketing campaigns for these events could help increase awareness of and also the number of attendees. These science-related activities and events should be more engaging, interactive and hands-on.
- 9.3 The younger population is a valuable target in this field. Interactive science-related education should begin from a younger age. It would help, should a more practical approach to science in schools be adopted.
- 9.4 Parents and grandparents inevitably come in contact with the subject due to their children's or grandchildren's involvement and interest. Therefore having campaigns or activities that focus on individuals with this specific demographic, would help these individuals find science more appealing.
- 9.5 The aim should be to involve the public more when it comes to legislation regarding science-related issues, and they should be better informed about the implications of this legislation.

ANNEX I – The Questionnaire

Perception and Attitudes towards Science

Good morning/afternoon. I am _____, from MISCO International and we are currently carrying out a survey about science. We are looking for individuals aged 16 years and older. Is there anyone in that household who I can speak to please?

SCREENER

101. How old are you?

WRITE IN: _____

1	Younger than 16 years	TERMINATE
2	16 -18 years	GO TO Q201
3	19 – 24 years	
4	25-34 years	
5	35-44 years	
6	45-54 years	
7	55-64 years	
8	65+ years	

INTEREST IN SCIENCE

For the purpose of this survey, when we mention science, we are referring to information relating to chemistry, physics, astronomy, biology, computer science, maths, medicine, geology, and engineering acquired either at school, work, leisure or by any other means.

Technology means the practical application of science which includes examples like electricity generation in power stations, antibiotics, sewage treatment, IVF and so on.

201. On a scale of 1 to 4, where 1 means no interest at all and 4 means very interested, how interested are you, in science? **READ OUT**

1	Not interested at all	GO TO Q203
2	Rather not interested	
3	Rather interested	GO TO Q204
4	Very interested	
5	Neither interested nor disinterested	GO TO Q207
6	Don't know	

ASK Q203 IF Q201=1-2

203. What have been the main factors that have affected your lack of interest in science?

1	Never had any interest or liking for science
2	I don't understand the subject
3	Never learned / studied any science subjects at school
4	Not my line of work
5	The subject is difficult
6	Science is in English/ I don't understand English
7	I don't believe in scientists/ people working in the sector
99	Don't know
Others (please specify)	

ASK Q204-Q206 IF Q201=3-4

 204. Why are you interested in science? **MR**

	It is part of my job
	Subjects studied at school/University/a specific educational course
99	Don't know
Others (please specify)	

 205. What have been the main factors that have affected your interest in science? **MR**

99	Don't know
Others (please specify)	

 206. Which areas of science interests you the most? **READ OUT; MR**

1	Health issues
2	Environmental issues
3	Medical/Pharmaceutical issues
4	Space technology
5	New inventions and technology (ex. Gadgets/robots)
6	New scientific discoveries
99	Don't know
Others (please specify)	

ASK ALL

207. What do you think are the top three things that would help people, especially youth, to become more interested in science?

99	Don't know
Others (please specify)	

208. How well informed do you feel you are about science?

For the purpose of this survey, when we mention science, we are referring to information relating to chemistry, physics, astronomy, biology, computer science, maths, medicine, geology, and engineering acquired either at school, work, leisure or by any other means.

1	Very well informed
2	Fairly well informed
3	Not very well informed
4	Not at all informed
5	Don't know

209. Which of these statements do you most agree with? When we mention science, we are again referring to information relating to chemistry, physics, astronomy, biology, computer science, maths, medicine, geology, and engineering acquired either at school, work, leisure, any science-related events or by any other means. **READ OUT**

1	I see and hear too much information about science
2	I see and hear about the right amount of information about science
3	I see and hear too little information about science
4	Don't know

210. I am now going to read out some statements about science and technology, and using a scale of 1 to 4, where 1 means you strongly disagree and 4 means you strongly agree, I would like to know how much you agree with each of them.

	Strongly disagree	Rather disagree	Rather agree	Strongly agree	Don't know
I have a positive experience of science education	1	2	3	4	9
I was interested in science when I was a teenager	1	2	3	4	9
Science is amazing	1	2	3	4	9
Science prepares the younger generations to act as well informed citizens	1	2	3	4	9
Young people's interest in science is essential for our future prosperity	1	2	3	4	9

SEARCHING FOR SCIENCE AND TECHNOLOGY-RELATED INFORMATION

301. Where do you usually come across information or news about science and technology when you are not actively looking for it? **DO NOT PROMPT; MR**

1	Radio
2	Magazines
3	Newspapers
4	School/university
5	Other people (colleagues, family, friends)
6	General Books
7	Text books
8	TV programs
9	TV Documentaries
10	DVDs
11	General Magazines
12	Science magazines
13	Academic Journals
14	Internet
15	News on TV
16	At my place of work
17	Adverts
Others (please specify)	

ASK Q301a IF Q301=14

Q301a. Where exactly do you come across information on the internet?

1	Search engines (ex. Google)
2	Facebook
3	Twitter
4	News Websites
5	General websites
6	Science websites
7	Academic websites
8	Blogs written by scientists or science commentators
9	Wikipedia
Others (please specify)	

 302. Do you **currently or have you ever**, actively searched for information about science and/or technology?

1	Yes, I currently search for information	GO TO Q303
2	Yes, I have searched for information in the past, but not currently	GO TO Q307
3	No, I never searched for information	GO TO Q310
99	Don't know	GO TO Q311

303. How often do you actively search for information about science and/or technology?

READ OUT

1	Daily
2	Weekly or more often
3	Fortnightly
4	Monthly
5	Every 2-3 months
6	Every 6 months
7	Less often
99	Don't know
Others (please specify)	

 304. For what reasons do you actively search for information about science and/or technology? **If it is school or work related, please specify how this information is used. MR**

99	Don't know
Others (please specify)	

305. When you search for information about science and technology, where do you normally look first? **DO NOT PROMPT; SR**

	Radio
	Magazines
	Newspapers
	School/university
	Other people (colleagues, family, friends)
	General Books
	Text books
	TV programs
	TV Documentaries
	DVDs
	General Magazines
	Science magazines
	Academic Journals
	Internet
	News on TV
	At my place of work
	Adverts
	Others (please specify)

ASK Q305a IF Q305=14

- Q305a. Which internet sources do you use?

1	Search engines (ex. Google)
2	Facebook
3	Twitter
4	News Websites
5	General websites
6	Science websites
7	Academic websites
8	Blogs written by scientists or science commentators
9	Wikipedia
	Others (please specify)

307. When you look for or have looked for information about science and technology in the past, did/do you generally find what you were looking for? **SR**

1	Always	GO TO Q308
2	Sometimes	
3	Rarely	
4	Never	GO TO Q309
5	It depends on the subject	
99	Don't know	GO TO Q311

308. Is the information that you find...? **READ OUT - SR**

	Always easy to understand
	Sometimes difficult to understand
	Often difficult to understand
	Never easy to understand
	It depends on the subject (DO NOT READ OUT)
99	Don't know

ASK Q309 IF Q307=4-5

309. What subjects do you find it difficult to find information about?

WRITE IN:

ASK Q310 IF Q302=3

310. Why don't you actively search for information about science and/or technology?

	Not interested in the subject
	Subject is too difficult
99	Don't know
Others (please specify)	

ASK ALL

311. Can you mention a Maltese science researcher? **MR**

1	Dr. Ing. Nicholas Sammut
2	Marco Cremona
3	Sir Temi Zammit
4	Prof. Richard Muscat
99	Don't know
Others (please specify)	

312. I am now going to read out some statements about science and technology, and using a scale of 1 to 4, where 1 means you strongly disagree and 4 means you strongly agree, I would like to know how much you agree with each of them.

	Strongly disagree	Rather disagree	Rather agree	Strongly agree	Don't know
I feel I get enough information about science through the media	1	2	3	4	9
I would be more interested in science and technology if they were discussed in everyday language	1	2	3	4	9
The information I hear about science in the media is generally true	1	2	3	4	9
I would like to have more information about science and technology	1	2	3	4	9
I find it hard to understand science	1	2	3	4	9
Science and technology are too specialised for most people to understand	1	2	3	4	9

AWARENESS AND PARTICIPATION AT SCIENCE-RELATED EVENTS

401. How often do you...

	Daily	Several times a week	Every two weeks	Every three weeks	Monthly	Every 2-3 months	Every 4-6 months	Less often than every 6 months	Mostly/ Only when abroad	Never
Visit Museums	1	2	3	4	5	6	7	8	98	99
Watch documentaries	1	2	3	4	5	6	7	8	98	99
Read about science	1	2	3	4	5	6	7	8	98	99
Access the internet on a computer to look for information about science	1	2	3	4	5	6	7	8	98	99
Access the internet on a mobile device to look for information about science	1	2	3	4	5	6	7	8	98	99
Attend a public meeting, debate or lecture on a science-related subject	1	2	3	4	5	6	7	8	98	99
Attend a science related public activity, ex. science week event or activity at a festival	1	2	3	4	5	6	7	8	98	99

402. Which of these science and technology-related public activities or events have you heard of?

READ OUT

403. Which of these activities or events have you visited or taken part in?

	Q402 Heard of	Q403 Visited
Science in the City	1	2
Malta Café Scientifique	1	2
NSTF Science Week 2011	1	2
Engineering Research Conference 2012	1	2

ASK Q404 IF Q403=AT LEAST ONE EVENT/ACTIVITY WAS CHOSEN

404. What was the main reason why you participated in this event or activity?

1	I like these kind of events/ These events are interesting
99	Don't know
Others (please specify)	

ASK Q405 IF Q403=AT LEAST ONE EVENT/ACTIVITY WAS CHOSEN

405. What other science and technology-related activities or events do you think could be organized?

99	Don't know
Others (please specify)	

406. On a scale of 1 to 4, where 1 means you strongly disagree and 4 means you strongly agree, how much do you agree that science and technology improve society?

	Strongly disagree	Rather disagree	Rather agree	Strongly agree	Don't know
Science and technology improve society	1	2	3	4	9

SCIENCE AND THE GOVERNMENT

501. Who do you think are the best qualified people and/or organisations to explain the impact of scientific and technological advancements to the public? **READ OUT - MR**

1	The State Government
2	Political parties
3	Environmental groups
4	Scientists
5	Hospitals
6	Religious groups
7	Commercial and broadcasting media, including newspapers, TV, radio
8	Science commentators
99	Don't know
Others (please specify)	

502. On a scale of 1 to 4, where 1 means no trust at all and 4 means a great deal of trust, how much trust do you have in the science and technology information provided by the following groups? **READ OUT**

	No trust at all			A great deal of trust	Don't know
The State Government	1	2	3	4	9
Political parties	1	2	3	4	9
Environmental groups	1	2	3	4	9
Scientists working for private companies	1	2	3	4	9
Hospitals	1	2	3	4	9
Religious groups	1	2	3	4	9
Commercial and broadcasting media, including newspapers, TV, radio	1	2	3	4	9
Science commentators	1	2	3	4	9
Well known scientists	1	2	3	4	9
Scientists working for universities or research institutes	1	2	3	4	9
Scientists working for government	1	2	3	4	9

ASK Q503 IF Q502=3-4

503. What makes you trust some and not others?

99	Don't know
Others (please specify)	

504. On a scale of 1 to 4, where 1 means none at all and 4 means a great deal, how much influence do you think you have on laws about scientific issues that are important to you? Examples of laws about scientific issues include Health laws such as IVF bill, Cigarette bans from public places, Legal age for drinking / smoking etc ...

505. And on the same scale, how much influence, if any, do you think you personally **should** have on laws about scientific issues that are important to you?

	Q504	Q505
A great deal	1	1
A fair amount	2	2
Not very much	3	3
None at all	4	4
Don't know	9	9

506. Do you think that Government funding for science research should ...

	Be reduced because the money can be better spent elsewhere
	Remain as it is
	Increase as research is important for the economy
	No opinion/ Don't know/ Not aware of current funding

507. I am now going to read out some statements about science and technology, and using a scale of 1 to 4, where 1 means you strongly disagree and 4 means you strongly agree, I would like to know how much you agree with each of them.

	Strongly disagree	Rather disagree	Rather agree	Strongly agree	Don't know
Science causes more problems than it solves	1	2	3	4	9
It is important that the community should be consulted about advances in science and technology	1	2	3	4	9
I am distrustful about science and science issues	1	2	3	4	9
Government investment in science research will result in more productive industries	1	2	3	4	9
The public is sufficiently involved in decisions about science and technology.	1	2	3	4	9
Scientists put too little effort into informing the public about their work	1	2	3	4	9
Scientists should discuss their research and its implications before they carry it out	1	2	3	4	9

DEMOGRAPHICS

801. Do you own or have easy access to the following:

		Yes	No
A	Internet at home	1	2
C	Internet on your mobile phone	1	2

802. Gender (**DO NOT ASK**)

1	Male
2	Female

803. Which of the following best describes your work situation? **READ OUT**

1	Work full time
2	Work part time/casual
3	Self-employed
4	Retired
5	Unemployed
6	Home duties
7	Student (full-time)
8	Volunteer (full-time)
Other (please specify)	

804. Do you currently work, or have worked sometime in the past, in the science industry? Jobs related to the science industry include those involved in areas of chemistry, physics, astronomy, biology, computer science, maths, medicine, geology, and engineering; production of goods and/or services related to science and technology; doctors/nurses, pharmacists, those working in software, technicians, gaming, IT, retail of IT products, production of computer/electronic components. **READ OUT**

1	Yes, I currently work in the science industry
2	No, I don't currently work in the science industry but I used to in the past
3	No, I have never worked in the science industry
4	Don't know

805. What is the occupation of the breadwinner in that household (the person who financially support the family)? **IF PENSIONER ASK FOR PREVIOUS JOB**

WRITE IN : _____

1	Professional / Managerial (high ranking police/army officers, engineer, accountant, lawyer, doctor)
2	Business Owner (more than 10 employees)
3	Business Owner (less than 10 employees)
4	Clerks/Executives/Administration Staff/Sales Representatives/Supervisors/Office Workers/ Stock Controllers/Housekeepers
5	Armed Forces/Police
6	Skilled Workers (plumbers, electricians, tile layers, carpenter, photographers, Heavy vehicle drivers, Bus drivers)
7	Unskilled Workers (sales assistants, waiters, care workers, cleaners, factory workers, delivery persons, labourers)
8	Student/Apprentice (living alone)
9	Living on Social Benefits /Unemployed

806. What is your highest level of education **in general**?

1	Doctorate (incl PhD)
2	Masters (incl LL.D; MD)
3	Post-graduate
4	Bachelor
5	College (Ex-teachers)
6	Higher National Diploma
7	Diploma
8	Post-secondary (6 th form)
9	Special secondary (technicum)
10	Secondary
11	Primary
12	Never attended school
99	Don't know
98	Refused

807. What is your highest level of education **in science**? When we speak of science we are referring to these subjects among others, chemistry, physics, astronomy, biology, computer science, maths, medicine, geology, and engineering. **Teachers graduated in a science subject – ex M.E/B.Ed Physics – code 4)**

1	Doctorate (incl PhD) (specifically chosen subjects)
2	Masters (incl LL.D; MD) (specifically chosen subjects)
3	Post-graduate (specifically chosen subjects)
4	Bachelor (specifically chosen subjects)
5	College (Ex-teachers)
6	Higher National Diploma (specifically chosen subjects)
7	Diploma (specifically chosen subjects)
8	Post-secondary (6 th form) (specifically chosen subjects)
10	Secondary (compulsory subjects)
11	Primary (compulsory subjects)
12	Never studied science-related subjects
99	Don't know
98	Refused

808. Locality: