

JAN05292 WHERE ARE THEY NOW? EVALUATING CONSTRUCTIVE SOLUTIONS TO THE DECLINE IN NUMBERS OF SCIENCE GRADUATES

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Abstract

With the continual decline in numbers of students studying science at tertiary level, Australian universities continue to provide opportunities for secondary school students to participate in interesting experiments in their laboratories. But do these science experiences influence the participating students' choice of career? In this paper we discuss the effectiveness of The Siemens Science Experience (TSSE), a national program that aims to provide Year 9 students with a three-day introduction to some of the wonders of science and technology. The research involved quantitative and qualitative research methods. Participants (both past and present) responded to questionnaires offering their opinions of the program. The data gained provide a sound indicator of the medium and long-term success of the program. Data analysis revealed the effectiveness of TSSE in encouraging students to study science in Years 11 and 12, and choose careers in science. Questions asked included: Where are you now and why? What role did TSSE have in your career choice? Did the program encourage a science career, but other factors intervened? Interviews and focus groups identified changes in students' interest in science as a result of participation in TSSE. Stakeholders, including local directors and organisers, and Rotary sponsors, were also interviewed about the program.

Shortage of scientists forecast

Predictions indicate that Australia will have a serious shortfall in skilled professional scientists, because the numbers of students studying science and technology at university level have declined noticeably in the last few years. The review *Australia's Teachers: Australia's future* (DEST 2003) recommended the gathering of comprehensive data about teachers in the workforce. In response to the review's findings, the Australian Council of Deans of Science commissioned a project that focused specifically on science teaching. The report *Who's Teaching Science? Meeting the demand for qualified science teachers in Australian secondary schools* (ACDS 2005) identified that 43% of senior physics teachers and 25% of Chemistry teachers lacked a major in Physics and Chemistry respectively. Without extensive knowledge in these areas teachers may not be as effective in fostering a desire in students to consider science as a viable career.

Furthermore, results of a recent study suggest that teachers of science may have degrees in disciplines other than science. Often such teachers are unable to stimulate students' interest, so these students prefer to study other discipline areas. Gunstone suggests that teachers of science and technology must be proactive to ensure they engage with students and make science fun. Teachers in many schools still present scientific knowledge using rote approaches to teach the facts in order to pass exams, but this does little to inspire students. He contends that science educators in Australia could learn from approaches in Finland where

Teachers help students achieve greater knowledge of their subject, and it provides them with a greater ability to control their own learning. They have the responsibility to try to come to grips with what it is they may find difficult to understand. (Gunstone cited in Anns, 2005:7).

In the state of Victoria the numbers of students in Year 12 VCE science courses continues to fall, and is evidence that interest in science in secondary schools is waning. This situation has repercussions for tertiary science and it is compounded by the fact that “Less than 40% of students whose year twelve subject choices best prepared them for tertiary studies in science actually undertook science studies” (Porter 2001:5). Research by Hackling, Goodrum and Rennie (2001) identified that the content of the science curriculum was having a strong negative influence on secondary students. When Ghali and Treagust (2003) explored possible causes for the decline in students choosing to study science, they found that Year 10 students perceived science and scientists negatively, and were not motivated to pursue science careers. At the University of New England, Lyons’ research focussed on high achieving students’ decisions about enrolling in physical science courses. One major finding of the study showed that students making different enrolment decisions had similar conceptions of school science, which, in most cases, did little to inspire them to engage further with science courses. Another finding was that

Students who did choose physical sciences courses described congruence between resources of family cultural and social capital, and the demands and anticipated characteristics of physical science courses. (Lyons 2004:1)

An additional concern is that Australian women are not fully involved in science careers despite making up 53% of all university graduates. The Australian Institute of Physics (AIP) carried out a survey that found female physicists are few and far between. Male physicists outnumber female physicists by 9:1. A closer look at the discipline of Physics shows that women only comprise about 25% of undergraduates and postgraduates in this field (Foley 2005). In the U.S.A. the balance is slowly changing as more women pursue advanced degrees. In the private sector and government, women only occupy a quarter of the science and engineering jobs (Ripley 2005).

TSSE designed to encourage student interest in science

An earlier report by the Australian Council of Deans of Science (1998) indicated that if Australia’s scientific capital is to be strengthened, then it will require cross-sector measures that are designed to attract more students to choose science subjects at school that lead into university science studies. Some university faculties have attempted to halt the downturn in science enrolments by introducing new programs aimed at enticing students into science. For example, Deakin University recently put in place a forensic science workshop for year 10 students.

Back in 1990, the proponents of The Siemens Science Experience (TSSE) recognised the importance of raising young Australian’s awareness of science and what scientists do, when they designed the first program for students going into Year 10. The non-profit association, the Science Schools Foundation Inc. is the body responsible for conducting TSSE, which is a hands-on three-day science program organised at universities across Australia. TSSE aims to provide every participating student with opportunities to engage meaningfully with science and technology. The program is designed for students entering Year 10 and has the main objectives to stimulate and heighten their interest in a wide range of study and career opportunities, and to encourage them to continue studies in science and technology.

TSSE is run nationally, and in the main during the summer vacation, for secondary school students. Siemens Ltd. is the major sponsor of TSSE programs, in conjunction

with Rotary Clubs who sponsor individual students. The study reported here was commissioned by the Schools Science Foundation Inc. in order to find out the perceptions of participants concerning the influence of TSSE on their interest in science. For those who had participated in previous years we wanted to find out if TSSE had influenced their decision-making in terms of school subject choice, career or university course.

The main purpose of the program is to provide students who will enter Year 10 the following year, and are at a critical stage in their education, opportunities to engage in exciting science and technology activities. In addition, during the several days of hands-on activities, students are given information concerning careers in these areas. Outcomes of such an experience should be that these students are motivated towards science and better informed about science and technology career pathways. In turn they should be in a position to decide on appropriate subjects in Years 11 and 12 that will enable them to make future career choices, whether they be university, TAFE or the workplace.

Another aim of TSSE is to stimulate student interest in science and technology. This aim is significant for Australia, because despite recognising the importance of having technically and scientifically literate citizens in our society, there continues to be a decline in numbers of students studying science at university level. This situation has resulted in fewer science graduates, and in turn, less numbers of scientists and trained science teachers.

From 1992 onwards the main sponsor of the program has been Siemens Ltd., a major worldwide high technology company. The program is actively promoted and supported by Rotary Clubs of Australia, the Australian Science Teachers' Association and the Young Scientists of Australia. Rotary clubs from around Australia provide annual sponsorship that takes the form of financial assistance for up to 700 participants so they can attend the program. Queensland programs are supported by State Departments. Corporations and local industries support the program, as do several universities who provide services without charge. At each university a Local Director arranges the program that is run by staff and other interested people. The Organiser's Handbook provides a set of guidelines for each local program. A typical program may involve the following activities, many of which are hands-on and experiential.

- Welcome by the Dean of the Science Faculty
- An icebreaker activity
- A Keynote Address
- Several hands-on activities in laboratories
- Talks on study and career opportunities
- Excursion to a local place of scientific interest
- BBQ or other social activity
- Closing ceremony (including parents and university staff) and awarding of prizes.

Since the program was initiated, a total of 423 TSSE programs have been conducted at universities throughout Australia. For several years, programs were also run in New Zealand. Since the inception of TSSE, a total of 36,364 students have attended. The highest number of participants occurred during the years 1995/96, when 3,100

students took part. Following this highly successful year the numbers of TSSE programs increased from 31 in 1995/96 to 35 in 1996/97, but then decreased to 33 the following year. The number remained at 33 until 2002/03 when it fell back to 31. Currently 31 TSSE programs are organised across Australia at both metropolitan and regional universities. Following the optimal number of participants in 1995/96 the numbers of students participating in the experience have fluctuated slightly. In 2003/04 2,497 students took part and in 2004/05 2,512 were involved.

Need for the study and research questions

Although a survey was carried out in the fourth year of its operation (Trembath, 1994), the current study reported here is the first major evaluation of TSSE. In 2004, the Science Schools Foundation Inc. decided to fund a research project that would obtain new information about how participation in the program effects students' interest in undertaking further studies, and whether it changes students' perceptions and attitudes towards science, scientists and a science career. Several research questions were posed, and in order to gain an overall evaluation of the national TSSE program, the project sought information from participants in all Australian states. The two research questions addressed in this paper are:

1. Does participation in the program increase a student's interest in undertaking further studies in science (a) in senior secondary school, and (b) at tertiary level?
2. Do perceptions and attitudes to science, scientists and a career in science change as a result of participation in the program? If so, what are the changes?

Research Methods

Evaluation of TSSE required both quantitative and qualitative data collecting approaches. Due to the large numbers of participants over the years, a quantitative approach was considered most appropriate to attain the bulk of the data. Supportive qualitative data were also deemed essential to complement the survey data. Questionnaires were considered to be the most efficient and expedient way to gather both the quantitative and qualitative data from various sources Australia-wide. Questionnaire-based surveys were mailed to previous participants; and emailed to all local directors. Qualitative data were obtained through informal conversations with the national director; Rotary members; local directors and organisers.

Each university organises its own program evaluation that is usually designed to gain feedback about specific sessions so the program can be improved. Feedback gained has been very positive, with students enjoying the hands-on activities the most. Past records kept in the national office were examined to obtain an overview of the perceptions of previous participants and directors concerning TSSE. Results of this examination informed the design of the research instrument, the questionnaire.

To determine whether they have chosen science careers and if TSSE influenced their career direction, previous participants were contacted by posting a questionnaire to the home address recorded when they enrolled in the program. The views of local directors, as well as Rotary members, were also sought using email containing specific questions. Some informal conversations between the researchers and stakeholders also provided data.

Survey of participants in previous years

Participants were identified from comprehensive records in the form of a database kept by the national office. In view of the lists of thousands of participants, to obtain a fair cross section, every 10th participant was identified from each of the five-year periods between 1992 and 2003/2004. The questionnaire was tailored to take into account the circumstance that these people had now chosen their careers. The same questionnaire was sent to participants in different states. The questionnaires were posted to the addresses lodged on the initial applications to attend the program. Sixty-seven of the questionnaires posted out were returned to the sender as undeliverable. This was not surprising given that at the time of their participation in the program participants were living at home. For the early participants, up to thirteen years had passed, and many had moved house during this time, making it difficult for the questionnaires to reach them. However this was the only way contact could be made.

The overall response rate to the questionnaires mailed to participants was 15.4% (n=140/908).

The questionnaire was designed with carefully crafted questions that addressed the aims of the study. The questionnaire required students to give direct responses to the questions and also gave them a chance to openly reflect on the program.

Question 1 was designed to identify how students initially found out about the program. It was hoped that responses would identify the individuals (e.g. science teachers) or the institutions (e.g. schools) that played a key role in informing the students about TSSE.

Question 2 explored who or what had influenced the students to take part.

Question 3 referred directly to Rotary sponsorship and sought to identify whether sponsorship was a deciding factor.

Question 4 sought to find out where and when they attended the program.

Question 5 sought to find out where they were working or studying now, and why they are there.

Question 6 asked if TSSE influenced their choice of career and if so to explain.

Question 7 asked if they chose a career other than science did TSSE encourage a science career but there were intervening factors.

Question 8 asked if TSSE encouraged them to attend similar programs?

Question 9 asked if they entered any science competitions such as BHP Billiton awards.

Questions 10 to 15 continued to focus on the participants' career progression. Responses were recorded using a Likert scale, with five levels between agreement and disagreement with the stimulus statement. Strongly Agree ranked 5 on the scale, while

Strongly Disagree ranked 1. Participants were asked to circle the number that most reflected their opinion.

Question 10 asked them if since attending TSSE they were motivated to take Years 11 and 12 science.

Question 11 required students to consider whether TSSE fostered their interest to continue their studies in science at university level.

Question 12 drew their focus to engineering/technological aspects of science.

Question 13 sought whether they had developed a better understanding of the work scientists do as a result of their participation in the program.

Question 14 again asked them to reflect on the entire experience and by doing so hoped to ascertain whether they showed enthusiasm for science and technology.

Question 15 asked participants to reflect on the experience and whether they perceived that this experience had any influence on their choice of university.

Question 16 provided an open opportunity for the participants to make any comments regarding their satisfaction with the program or recommendations for further TSSE programs.

Results: effects of participation in TSSE on interest to study science

Figure 1 shows that of the participants who attended TSSE prior to 2004, 52% strongly agreed and 38% agreed that they were more motivated to do further studies in science since TSSE, while 0.05% are undecided or disagree.

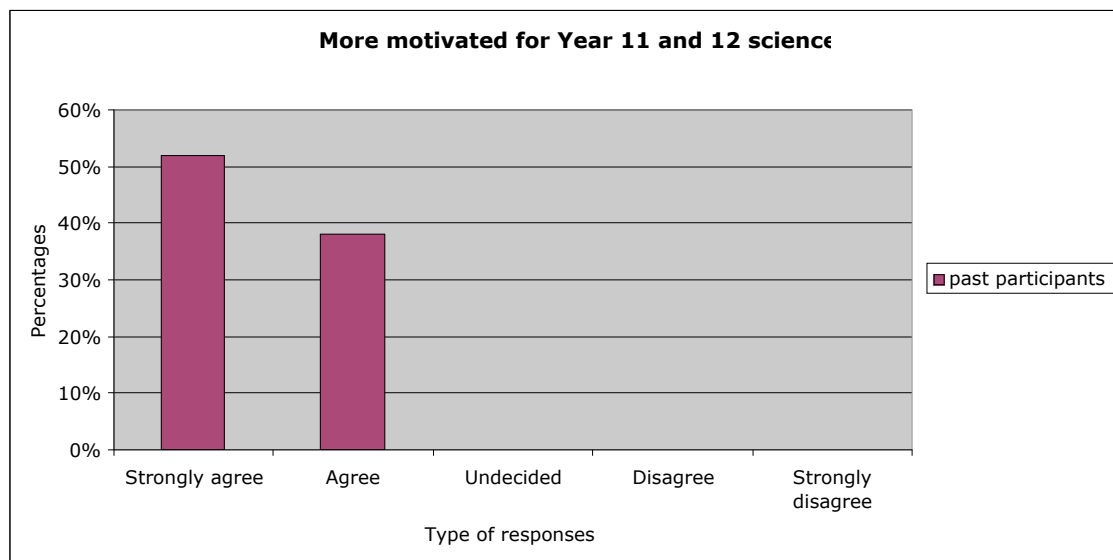


Figure 1 Effect of TSSE on motivation to study science at Year 11 and 12 for participants prior to 2004

When asked whether they were more interested in studying tertiary science since attending TSSE, Figure 2 below shows that of those participants who attended the program prior to 2004, 27% strongly agree, 42% agree, 12% are undecided, while 18% disagree and a few strongly disagree.

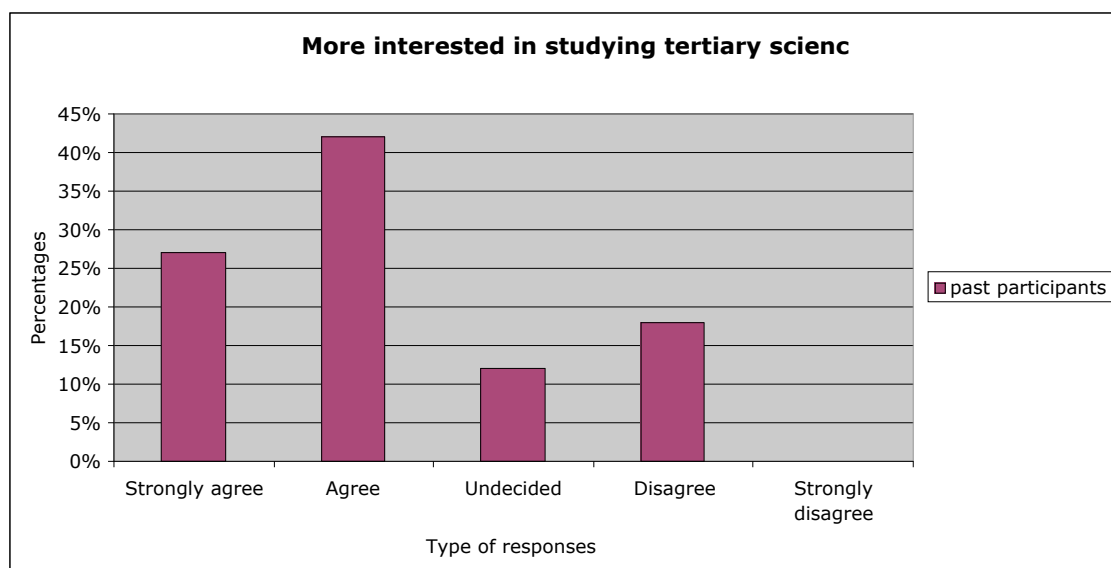


Figure 2 Effect of TSSE on interest to study tertiary science

When questioned about whether they were ‘more interested in studying engineering/technology’ since attending TSSE prior to 2004, it can be seen in Figure 3 below, that 12% strongly agree, 18% agree, 18% are undecided, 12% percent disagree, with only a few who strongly disagree.

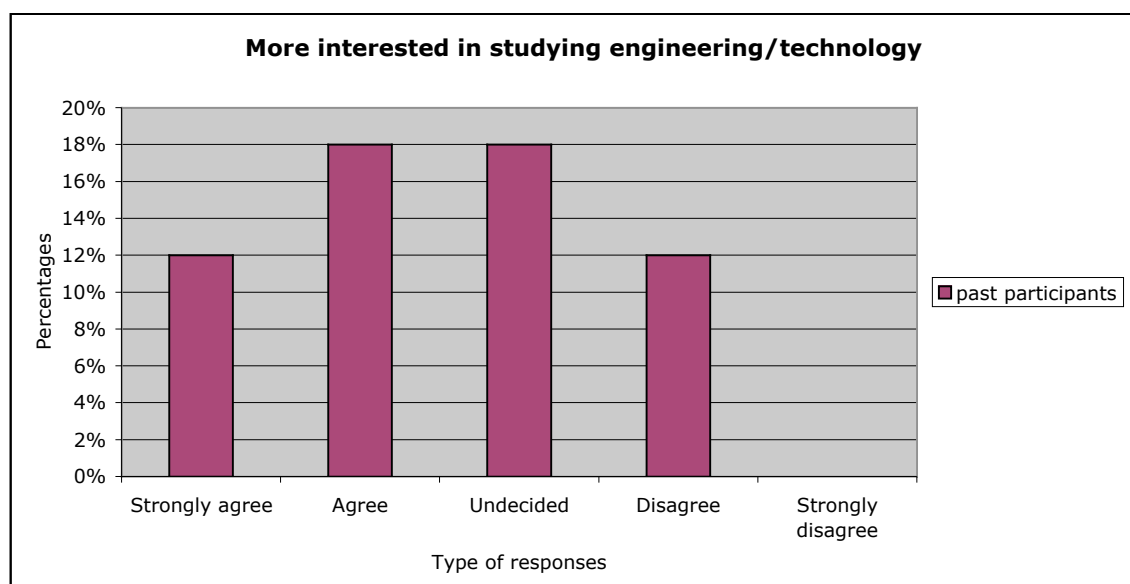


Figure 3 Effect of TSSE on interest to study engineering/technology

The following comments are from participants who were influenced by TSSE to choose science in Year 10 and beyond.

I was only in Year 9 at the time, so I was still unsure. TSSE only influenced me to the extent that I chose a science elective in Year 10. (Metropolitan University male participant, VIC, 1995)

Early encouragement and exploration of topics such as science can help direct young students to career choices that have to be made at the tender age of 17-18. By experiencing TSSE, I saw the options available after high school, which helped me choose a science career and motivate me for the remainder of my high school years. (Regional University female participant, QLD, 1995)

Attitudes towards, and interest in science after participating in TSSE

Figure 4 shows that for the participants who attended prior to 2004, the majority - 39% strongly agreed and 50% agreed - were more interested in science, 10% were undecided and a few disagreed. This means that a very high percentage, 89%, 'feel enthusiastic about science and technology', which is very encouraging.

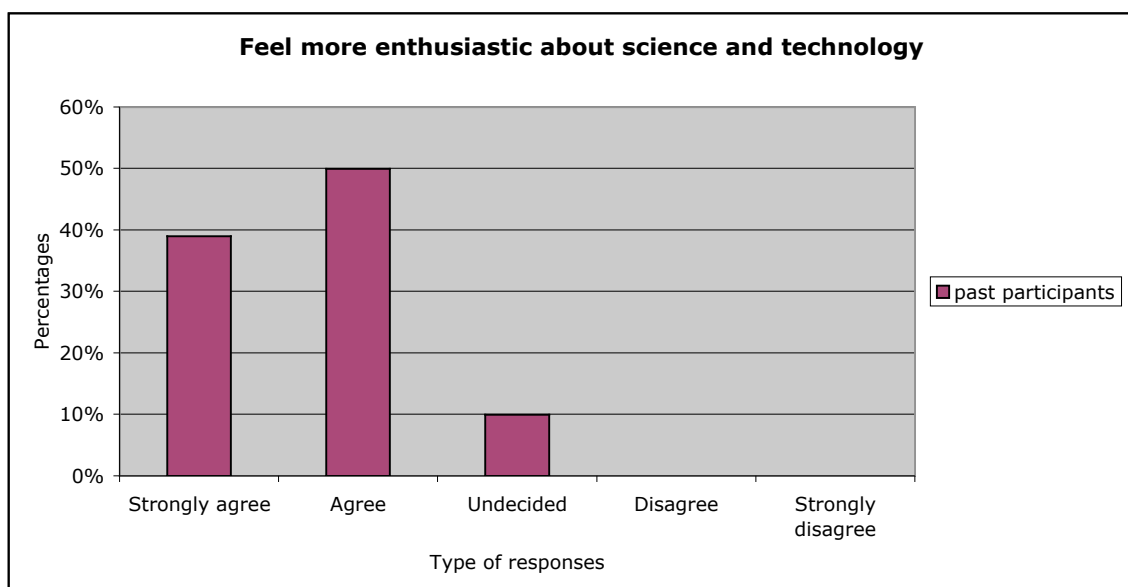


Figure 4 Effect of TSSE on the enthusiasm of participants prior to 2004 about science and technology

Participants responded that science was more interesting, and even 'cooler' than they previously thought. There was recognition that science embraces diverse fields of knowledge and is far broader and richer than school-based science experiences that focus on Physics, Chemistry and Biology. In fact, science is a massive field that has so much to explore. The response below is evidence that TSSE can change a student's view of science from a content-focused, narrow field as presented at school, to an understanding of science as a diverse field that can be fun.

In school I enjoyed science and TSSE was an advantage in broadening the fields of sciences available at school. It was an enjoyable experience. I recommend it to anyone with an interest in science as it was a hands-on introduction to the fun

side of science away from the books. (Metropolitan University male participant, QLD, 1990/1991)

Figure 5 shows that for participants prior to 2004, most (28% strongly agree, 57% agree) have a better understanding of scientists' work, while 13% are undecided and only 2% disagree. These percentages, and participants' response below, indicate that one of the strengths of TSSE is that participants get to understand what scientists do.

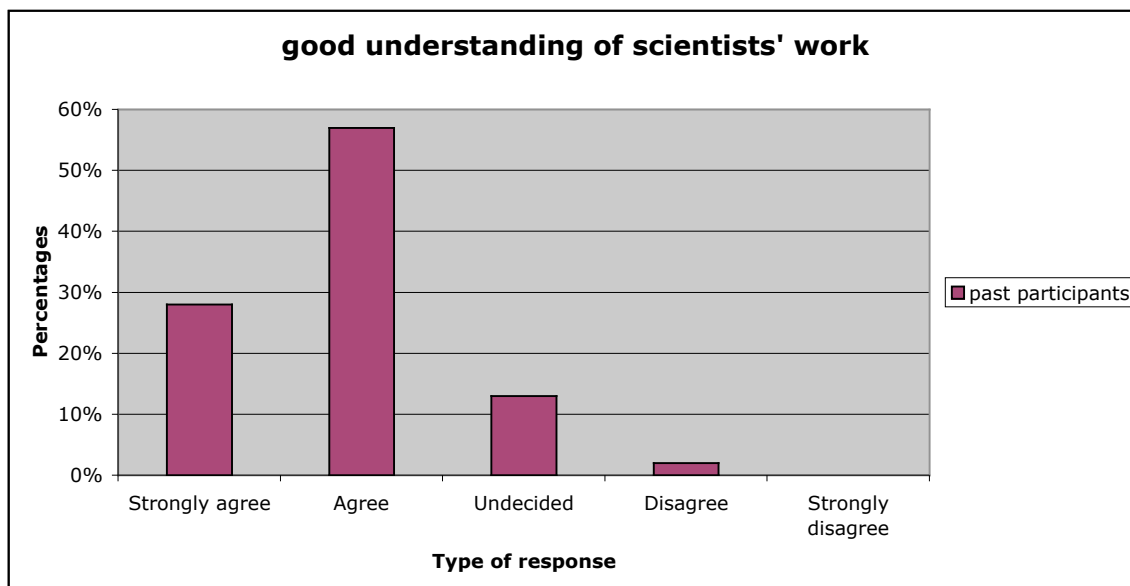


Figure 5 Effect of TSSE on participants' (prior to 2004) understanding of scientists' work

I was already interested in engineering. TSSE gave me great insight into the role of scientists. Although I attended TSSE 4 years ago, I still have vivid memories of the experience. The lecturers gave funny, interesting presentations that explored many different areas of science. This positive experience gave me great insight into what scientists do and provided an excellent boost on which to enjoy HSC sciences!! (male participant, 2000/2001)

Effects of TSSE on participants career choice

Male participants prior to 2004

Table 1 below, indicates the choice of career/qualifications made by male participants who attended the program prior to 2004.

Table 1 Male participants' (prior to 2004) choice of career/qualifications

| Question 5 | Total |
|---------------------------|-------|
| Science career | |
| Engineering degree | 4 |
| Science degree | 3 |
| Medicine degree | 2 |
| Human Movement | 1 |
| Pharmacy degree | 1 |
| Non Science career | |
| Business degree | 2 |
| Accounting | 1 |

| | | |
|--|----------------------|----|
| | Retail | 1 |
| | Law degree | 1 |
| | Office | 1 |
| | Screenwriting degree | 1 |
| | Still at school | 27 |

Forty three per cent of males responded ‘yes’, that ‘TSSE had influenced their choice of careers’. Comments below reveal that although TSSE had a positive influence, this may not translate to a career in science.

My career plans at present involve psychology that I was introduced to at TSSE. In fact, I did work experience with the psychology presenter. TSSE has encouraged science, but I still plan to do something different/more fun e.g. travelling actor for the first part of my life. (Regional University male participant, NSW, 2003/2004)

Yes TSSE confirmed that engineering was the field that I was passionate about and had an aptitude for. I therefore geared my VCE subjects towards study in this field. Due to financial constraints, I was unable to study engineering and so began working full time and forging a career in medical practice management. I am currently a full time mother and am hoping to return to study within the next two years. (Metropolitan University female participant, VIC, 1991/1992)

Fifty two percent indicated that ‘TSSE had not influenced their career choice’, while two did not respond to that question. However, some clarification is needed because some ‘no’ responses were from participants who had already decided on a science career, such as those below.

Not really as already interested in a science career. (Metropolitan University male participant, QLD, 1995/1961)

Not really, because I had always wanted to pursue science as a career. (Metropolitan University male participant, VIC, 2002/2003)

Participants responded to the question, If you chose another career other than science, did TSSE encourage a science career? Reasons given for not choosing a science career include:

There are more job opportunities and money in careers other than science.

I couldn't see science giving me enough of a career path and money long term. I really enjoyed the program, however as I got older my career choices changed. (Regional University male participant, QLD, 2000/2001)

Science is not valued enough in Australia.

TSSE helped encourage a science course but I don't think Science careers are valued or appreciated enough in Australia. This factor certainly influenced my change to an alternative career. (male participant, 1995/1996)

It is too hard to find work with a B.Sci.

The numbers of fellow students in B Sci led me to believe it would be very hard to obtain work at the end of degree – so I changed to Physio. (male participant, 1990/1992)

Other interests intervened.

Yes other factors, primarily because you needed to do post-grad studies to progress in science, and I was not committed, nor did I have enough finances. Furthermore I wanted to work overseas, and science does not give you that same opportunity. Because I chose business and marketing I have been fortunate enough to work in London and New York. Even though I chose a career path away from science, I still encourage my cousins and family friends to participate in such a program, as it gives them invaluable exposure, experience and knowledge of the science industry. (Metropolitan University male participant, VIC, 1994/1995)

TSSE encouraged a science career very much. But when I started working at McDonalds, my interest in business became stronger and eventually influenced my career. (Regional University participant, NSW, 2000/2001)

Female participants prior to 2004

Table 2 indicates female participants’ choice of career/qualifications and shows the non-science careers as being more varied than for the male participants. Forty three percent of female past participants indicated ‘yes’, that TSSE had influenced their choice of careers. Fifty seven per cent indicated ‘no’, that TSSE had not influenced their career choice.

Table 2 Female participants’ (prior to 2004) choice of career and qualifications

| | | |
|---------------------------|-------------------------------------|---|
| Science career | | |
| | Behavioural science | 3 |
| | Pharmacy degree | 3 |
| | PhD in Science | 3 |
| | Medicine Degree | 3 |
| | Nursing degree | 3 |
| | Occupational Therapist | 2 |
| | Applied Science Degree | 2 |
| | Environmental officer | 2 |
| | Pharmacist | 2 |
| | Science degree | 1 |
| | Nutritional therapy | 1 |
| | Osteopathy degree | 1 |
| | Microbiology scientist | 1 |
| Non Science career | | |
| | Primary / Secondary teaching degree | 6 |
| | Arts degree | 3 |
| | Accounting Degree | 2 |
| | Law Degree | 2 |
| | Marketing degree | 2 |
| | Navy | 1 |
| | Mother | 1 |

| | | |
|--|--------------------------|----|
| | Journalism degree | 1 |
| | Retail | 1 |
| | Salvation army volunteer | 1 |
| | Sheep Farmer | 1 |
| | Office | 2 |
| | Architecture degree | 1 |
| | Philosophy degree | 1 |
| | Teachers aide | 1 |
| | Still at school | 37 |

Reasons given by female participants for not choosing a science career included ‘other interests intervened’ as the comment below shows.

As I was unsure of which career path to take, TSSE let me explore the possibility of a career in science. It did encourage a science career, but my passion for music was too great. (Metropolitan University, female participant, QLD, 1995/1996)

*TSSE had no influence on my choice of career, other than to open my eyes to where I could have otherwise gone. TSSE made a career in science seem challenging and rewarding but I found working part time while studying actually led me to fields of more interest. (Metropolitan University female participant VIC, 1990 now working full time in a Hardware Company Head Office)
 There because great job, working environment and potential for growth.*

Similar to some male participants (see above under ‘It is too hard to find work in science’) the following female participant raises questions about the viability of choosing science as a career.

If the purpose of this questionnaire is to find out ways to market science as a career, then I believe students need to feel there is a viable career for them. I’m not speaking for myself – I know a girl who has recently transferred from her science degree into something totally unsuited to her. I also know that many of my friends are studying medicine or the health sciences because they don’t believe or doubt they can build a career from doing lab work. Another friend is studying marine biology but he doubts he can find a job after uni. (Female participant, state not supplied, 2001)

Discussion of findings

Does participation in the program increase a student’s interest in undertaking further studies in science in senior secondary school and at tertiary level?

Teaching science and technology to engage students’ interest is a key concern. Participants in TSSE overwhelmingly endorsed the ‘hands-on’ approach. Participants’ comments such as “it’s much better than school” were common. “Having fun” was another key response from TSSE participants and supports the notion that bringing the fun element into the classroom develops knowledge and empowers students. Students who are engaged with a subject will follow it through and this may influence their career pathway.

It is encouraging to see good participation rates in TSSE among young women in some areas. Their responses to open questions in the questionnaires indicate that they are seriously open to knowledge of what is available in their forthcoming years at school. In many instances, the girls expressed interest preference to study the human sciences, but like the boys, most enjoyed experiences such as robotics. TSSE is

certainly filling an important role in alerting participants to possibilities that may lead to careers in a diverse range of sciences. Although participants, and girls in particular, may be more focused on fun, friendship and like-minded people at this stage, TSSE paves the way to consider challenging careers in areas that were previously male dominated. Introducing women scientists who are attractive and well presented would perhaps go some way to alleviate the widely held stereotypical image of white-coated professionals in sterile environments.

TSSE participants were amazed by the depth and breadth of scientific fields. Their prior unawareness indicates a seeming shortfall in science programs in schools, many of which are exam oriented with focus on facts rather than illuminating the range of possibilities. TSSE to a large extent makes up for the narrow focus in some school programs. However, this could also be related to the fact that many teachers of science are teaching in curricular areas beyond their expertise.

The key question, as to whether participation in TSSE increases students' interest in undertaking further studies in senior secondary school and university, remains a vexing issue. Students are certainly interested in sciences after their involvement in the program but perhaps their enthusiasm and momentum wane once they are back at school. Most students who do pursue science and technology subjects were already interested or even passionate about them beforehand.

Do perceptions and attitudes to science, scientists and a career in science change as a result of participation in the program? If so, what are the changes?

Findings of the study indicate that the participants' attitudes to science did change as a result of their involvement in hands-on activities provided by TSSE. The study found that 90% of participants prior to 2004 agreed that they were more enthusiastic since participating in TSSE. The majority of participants, 85% for students prior to 2004, agreed that they now had a good understanding of how scientists' work. Participants clearly benefited from finding out about the broad range of careers that science can lead to. Many perceived that gaining this information was an advantage and a strong benefit of the program.

Programs designed to encourage tertiary science enrolments

For Australia to have sufficient top quality scientists in the future, young people must be encouraged to explore career pathways in the science and technology fields. A major aim of TSSE is to provide Year 9 students throughout Australia, with the opportunity to experience engaging hands-on activities in a tertiary institution. The project found that TSSE plays an important part in providing students with an understanding of the wide range of science fields.

TSSE is one of several incentives offered to middle school students in Australia to enrich their science experiences and expand their knowledge of careers in science. The organisers of TSSE recognise the importance of developing interest in science among all students, rather than only those who are considered scientifically inclined. TSSE offers a positive pathway for enthusiastic young people to consider entering diverse scientific fields. However, the study found that one of the main reasons that students choose to participate in TSSE is that they 'love science', which means that participants are already interested in science. Unfortunately their awareness of the diversity of science fields and careers in science is somewhat limited at this stage of their schooling. TSSE addresses the need to raise students' awareness, by providing

information that will help students make informed subject choices, by offering them rich experiences in university settings which expands their understanding of careers in science. Supporting young people's interest in becoming scientists may need a broader knowledge of who scientists are and what they actually do. Closer contact with a diverse range of people who work in the science field should be encouraged and TSSE is providing that contact.

Conclusion

This paper has provided quantitative and rich qualitative data that show the effects participation in TSSE has on the students who attended prior to 2004. For most students, they became more interested in studying years 11 and 12 science. However this interest did not necessarily translate into tertiary science studies. Some participants, although interested in science, have chosen careers other than science for a range of reasons. Amongst these is the perceived lack of job opportunities or career pathways in science. Most participants in TSSE are high flyers and have high aspirations in terms of going overseas and gaining financially from their careers. Many participants are interested in numerous areas and their passion for music, marketing and managerial opportunities, to name a few, tended to become prominent as they grew older. The majority of participants in the survey felt that TSSE has been a highlight in their life and they recommend the program to other students at every opportunity.

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