Examining Parents' Responses to CSIRO's Holiday Science Activities

The Commonwealth Scientific and Industrial Research Organisation

4 March 2011

An Interactive Qualifying Project Report
completed in
partial fulfilment of the Bachelor of Science degree at
WORCESTER POLYTECHNIC INSTITUTE
Division 51: HXA-A113

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Abstract

Our team conducted an in-depth analysis of the Commonwealth Scientific Industrial Research Organisation's (CSIRO) Holiday Science Activities in Melbourne, Australia. We obtained data through parental surveys before the activities; observations of the children during the activities; telephone interviews with parents after the completion of the activities; observations and interviews with program directors of other holiday programs around Melbourne; and interviews with the CSIRO staff. We concluded that the programs satisfied both parents and children by exciting science interest in children; however, we also identified possible improvements for future programs.

Acknowledgements

Our time in Australia has been wonderful and it was worth every mile (or kilometre) that we travelled. There are so many people we would like to thank for helping us with our project and making our experience in Melbourne the time of our lives.

First, we would like to thank our advisor, Professor Ault, for directing the Melbourne Project Centre allowing us to experience our project in a different country and culture. Thank you for all the suggestions, corrections, and guidance throughout the past two terms. Your help has been greatly appreciated in making this project successful. And most importantly, thank you for all the delicious snacks and treats you provide us with (as long as we return your baking pans).

We would also like to thank Professor Shockey for the instruction in ID 2050 and for helping us make sure we were prepared for our time in Australia.

A huge thank you to all the staff at CSIROSEC Victoria for making us feel welcome in the office. Thank you to Caitlin for answering all of our questions, helping us with absolutely anything, and taking Chris' place at the final presentation. We could not have gotten half the information we needed from Chris without you. Thank you Sean for graciously driving us to the Holiday Science Activities and giving us a couple extra minutes of appreciated sleep. Also, thanks Cath for listening in on our writing sessions and providing suggestions to make our sentences flow better (especially when we were banging our heads together over a single sentence for hours at a time).

Thank you to Elke, Cath, Gemma, and Sean for being interviewed and giving us "correct answers" to almost all the questions. And thank you for to the rest of the staff that answered any of our inquiries into Holiday Science Activities or any other CSIRO programs.

Thank you Gemma for inviting us to your house on Phillip Island. We hope you continue playing the card games we taught you. We had a great weekend, one we will never forget! Thank you for the crumpets, hopefully you can try an American biscuit one day. Thanks to Sean and Steph for driving us there. Steph, don't you worry, we will never get lost again thanks to the help of the Tram Tracker Beagle. And thanks to Sophie for introducing us to the Tim Tam Slam! Nicola, thanks for inviting us to your house and playing ping-pong. Thanks to Ava for organising an awesome night of trivia with the CSIRO staff (although we think it may have been rigged).

Thank you to our families who allowed us to fly to the other side of the world for seven weeks. Your constant love and support was always felt and appreciated. Where would

we be without you?

Last, and *certainly least*, thank you to Chris for always giving us additional ideas, plenty of distractions, introducing us to the newly discovered Southern Ocean, and always making us laugh. Brie still can't understand a word you say, but she's learned to laugh along. Also, thanks for providing us contact information to numerous organisations, insight on various educational concepts, and watching all of our presentations to make sure we were the best team every Wednesday night. We have learned so much from you that we will continue to use throughout our careers and lives.

Thank you everyone who contributed to our project and helped in making it such a positive experience.

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ABS- Australian Bureau of Statistics

CSIRO – Commonwealth Scientific and Industrial Research Organisation

CSIROSEC – Commonwealth Scientific and Industrial Research Organisation Science Education Centre

STEM – Science, Technology, Engineering and Mathematics

DEECD – Department of Education and Early Childhood Development

VELS – Victorian Essentials Learning Standards

SEDL – Southwest Education Development Laboratories

WPI – Worcester Polytechnic Institute

Executive Summary

The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia's national science agency, strives to promote science interest in children. This is a difficult task as new innovations in science and technology are constantly being developed. However, CSIRO has taken action to ensure that the children of today are well prepared to face the challenges this may present tomorrow. To promote science interest, CSIRO travels to schools as well as hosts a variety of holiday activities through their Science Education Centre (CSIROSEC).

The success of the Holiday Science Activities has never been formally analysed. Are these Holiday Activities an important part of CSIRO's infrastructure? Are they satisfying the needs of the parents and children? Why do they continually book out weeks in advance? With these questions in mind, we developed several methodological approaches to obtain data to measure the responses of parents and children to the holiday programs.

Our methods consisted of a pre-program parent survey administered immediately before the program, a post-program telephone interview with parents completed 2-3 weeks after the conclusion of the program, and observations of the children taken during the program activities. We also assessed other holiday activities in Victoria and interviewed CSIRO staff members to supplement the program data. We targeted our methods to answer the following questions:

- Why do parents bring their children to CSIRO Holiday Activities?
- Do the activities have an educational impact on the children?
- What other holiday activities are available to children and how do they compare to CSIRO's Holiday Activities?
- Are the CSIRO Holiday Activities satisfying parents and children?
- What improvements can be made to the Holiday Activities?

An essential aspect of this project consisted of determining the reasons governing parents' decision for choosing CSIRO's Holiday Activities for their children. To quantify parental responses, we had parents rate a total of nine factors that we deemed important. These responses would aid us in identifying the main factors influencing parents when booking a holiday program.

Parental feedback provided us with parents' perception of the overall impact of the

activities on their children. As a science organisation, CSIRO strives to instil a motivation to learn science in the children that attend their Holiday Activities. The activities have the potential to serve as a medium for increasing a child's general interest in science. Thus, the activities are structured to capture a child's attention through hands-on science education.

To ensure that CSIRO is effectively delivering science education, we looked at other holiday activities, science-based and non science-based, around the area. Through the examination of these activities we devised a general list of positive features that encompass parents' image of a holiday program. These features aided in compiling a list of recommendations about possible improvements to CSIRO's Holiday Activities.

Our analysis of CSIRO's Holiday Activities offered answers to the questions outlined above. Additionally, we were able to note any increase in children's immediate science interest. Most importantly we were able to confirm parents' overall satisfaction with the activities.

We found that the parents of children who attended the Summer 2011 Holiday Science Activities were well educated and well informed about science and technology related topics. CSIRO wants to have an impact on children who are interested in science and those who are not. Currently, they are mainly attracting children who have a high interest in science. Most of the people who attend the Holiday Activities heard about them through CSIRO's Double Helix Science Club, word of mouth, or from prior attendance. Although CSIRO conducts no formal marketing, the activities consistently book out weeks in advance. If CSIRO aims to spark science interest in those who are not interested in science, then they should promote their activities to a broader audience.

Opening up a new program site is also another way to reach new children. Additional sites would attract people from new areas without taking away from the population who attend the activities at existing sites. New program sites could also offer CSIRO a new demographic of people attending their activities.

Our data tell us that the majority of parents and children were satisfied with the Holiday Activities. We found that some parents and children thought the Intermediate level activities were too simple for the age range (10-13), closely resembling activities presented to the Junior level (age 7-9). As a result, we recommended that the activities be specifically designed to challenge each age group.

Further recommendations on the structure include program flexibility with the length of the activities, duration of activities, and availability of equipment. We propose to make all

the activities equal in length of time. Also, there needs to be enough equipment for every child to participate and complete each activity individually.

Some parents thought that the items their children brought home did not reflect the parents' investment in the program. To improve their satisfaction, CSIRO should have the children make one or two higher quality items instead of three basic items. A handout explaining the item, its use, and its function could also be sent home with the child to help the parents understand the device. CSIRO could also post additional information and activities on their website so children can experiment at home. Parents also suggested the idea of a multi-day program for science-interested children. We found that many parents expressed their interest in this idea, and we would like to recommend this to CSIRO.

CSIRO currently offers one set of three activities at each site. CSIRO should consider expanding the number of sets offered at a particular site so children can attend multiple activities at the same site. Furthermore, we proposed additional studies that could further improve the Holiday Activities:

- Determine why there is a decrease in attendance from the Junior level to the Intermediate level
- Explore the potential of opening new sites further away from the current ones
- Develop a connection between the school activities and the holiday activities

Through our five steps of data collection, we were able to successfully evaluate the parents' responses to CSIRO Holiday Science Activities. The information gathered in this report reflects CSIRO's goal of promoting science interest, impacting the children, and the importance of the Holiday Science Activities to CSIRO.

Chapter 1 Introduction

The world we live in changes every day through science and technological discoveries. A strong background in science literacy is essential for understanding the economic, social and environmental challenges we face. One of the goals of the Commonwealth Scientific and Industrial Research Organisation (CSIRO) is to help people keep pace with new discoveries and innovations because technology is always improving (CSIRO, 2005b). "Science is changing our society daily - but can our society keep up?" asks Dr. Kath Kovac, editor of the Helix, a popular magazine published by CSIRO. She also states that a scientifically literate society begins with strong science education. However, secondary schools are showing decreased student enrolment in high level physics and chemistry classes (CSIRO, 2005b). Dr. Kovac and many others are concerned that Australia's science literacy will continue to decrease if the country does not see an improvement in science education.

The Australian Government Department of Education, Science and Training released a National Action Plan in 2008 to address and increase students' science literacy. One way the government plans to implement this is by having students learn from hands-on activities, open-ended investigation, and increased group work. The department wants to motivate students towards science in hopes that they will not shy away from these fields. However, "school students spend less than 20% of their waking hours in school, and less than 20% of this time will be explicitly about science" (Goodrum, 2007, p. 27). Science literacy must be a life-long learning process that also occurs outside of the classroom.

CSIRO is a national science organisation established by Australian Government that seeks to instil a science interest amongst the younger generation. Their mission states that, "by igniting the creative spirit of our people we deliver great science and innovative solutions for industry, society and the environment" (CSIRO, 2010b). The education sector of CSIRO works to promote science inspiration in and out of school through classroom workshops, weekend events, and community activities. All of their programs contribute to CSIRO's goal of having an impact on the Australian community by encouraging students to enjoy science and pursue technological careers.

CSIRO Science Education Centre (CSIROSEC) of Victoria provides these types of science activities. CSIRO's Holiday Science Activities are a group of science-oriented day programs that are provided for the community during school holidays. While the programs are not linked to a school curriculum, they are educationally designed to provide students with a foundation in basic science. CSIRO hopes to motivate children to learn more about

science. The Holiday Activities have been very popular as they always fill to capacity several weeks prior to their commencement.

The programs have never been formally assessed, and CSIRO would like to better understand the reasons for their popularity. They also inquire whether or not the programs are impacting students' enthusiasm toward science. Because CSIRO is always working to improve their science education, the programs should be evaluated.

CSIRO asked our team to complete an in-depth assessment of their Holiday Activities. We determined the parents' reasons and motivations for bringing their children to the Holiday Activities and the impact these programs had on students. We presented our data to CSIRO with recommendations so they could continue to improve their programs. This will benefit their organisation by fulfilling their goal of teaching and promoting science. In turn, the Victorian community will benefit through an improved holiday program that encourages students to pursue science careers.

If CSIRO's mission of spreading science knowledge is to be successful, then their Holiday Activities must also be successful for parents and children. Our project measured this success from various perspectives so the value of the programs can be maintained through future improvement.

Chapter 2 Literature Review

Before we could assess CSIRO's Holiday Science Activities, our team investigated a few conceptual topics in greater depth. First, we evaluated CSIRO's role in Australia's science community. Second, we examined the science curricula of Australia and Victoria. Next, we discussed the differences between formal, non-formal, and informal education as well as the motivation for hands-on learning. We also summarized other holiday activities in Victoria. Finally, we explored a variety of research methods, some of which were applied to our assessment.

2.1 CSIRO Background

Founded during the 1920s, CSIRO has been a leading science research agency throughout Australia for about 80 years. The organization has sought to create an impact within the Australian community by putting forth technological advances, revolutionizing the way the community views science, and aiding in industrial innovation. In doing so, CSIRO improves the standards of living in Australia by providing jobs and maintaining a sustainable environment. CSIRO enriches the Victorian community by offering student workshops, research projects, science demonstrations and community programs revolving around science-based topics (CSIRO, 2010b).

Since the year 2000, CSIRO has implemented four stages of strategic planning in hopes of increasing their impact and benefit to society. The stages were designed to improve the annual operational plans of CSIRO as a research enterprise. The first stage took place from 2000 to 2003, when CSIRO sought to view their stakeholders and clients with more importance. The second stage, from 2003 to 2007, focused on executing their goals and strategies more efficiently. The third stage, from 2007 to 2011, focuses on the momentum of the organization when delivering basic science education. Lastly, the fourth stage, from 2011 to 2015, will concentrate on CSIRO's position as the nation's leading science agency by bringing about educational and environmental benefits to the Australian society. Overall, these four stages have set the foundation for the activities, programs, and goals of the organization, and how it will impact the Victorian community (CSIRO, 2007). Currently, CSIRO is undergoing their third stage of planning. In this stage they focus on delivering basic science education; one way they accomplish this is through their Holiday Activities.

2.1.1 CSIRO's Relation to STEM Education

CSIRO is "an independent statutory authority governed by the *Science and Industry Research Act 1949"* (CSIRO, 2006, p. 1). CSIRO faces the nation's challenges from environmental, climate change, and industrial development to health related issues. The twelve core areas that CSIRO excels at include: Astronomy & Space; Climate Change; Energy; Environment; Farming & Food; Health & Well-Being; Information & Communication Technologies; Manufacturing; Materials; Mining & Minerals; Ocean & Coasts; and Transport & Infrastructure (CSIRO, 2008). CSIRO promotes a technology-oriented lifestyle through the development of new technologies. They believe that the organisation can provide the Australian citizens with a safer environment based on sustainable practices. Most importantly, CSIRO strives to "advance the frontiers of science" and maintain its position as the nation's leading science agency (CSIRO, 2007, p. 12).Their impact has reached three different levels: organisational, national, and global. A portion of this impact is visible in their contribution to science, technology, engineering, and mathematics (STEM) education of primary and secondary students. Rodger W. Bybee, an executive director of the United States based Biological Sciences Curriculum Study, states that "a true STEM education should increase students' understanding of how things work and improve their use of technologies" (Bybee, 2010, p. 996). This statement relates to one of CSIRO's core objectives: to promote a STEM-oriented science education.

2.1.2 CSIRO's Holiday Science Activities

CSIRO's Science Education Centre in Victoria hosts a diverse range of science education programs that target both primary and secondary students. These programs are further supported by the Department of Education and Early Childhood Development from the Victorian government, as well as the Catholic Education Office in Melbourne. Since 1986, one of their most prevalent offerings is known as the Double Helix Science Club. The club seeks to motivate children to become enthusiastic about science through programs and magazines (CSIRO, 2010a).

As means of expanding the children's science knowledge, CSIROSEC offers many programs to schools and communities. The majority of the school programs last from 75 to 120 minutes and are conducted at local schools or at the Highett site, home to CSIROSEC Victoria. The programs are available to children of all ages and address different subjects such as biodiversity, robotics, and chemistry (CSIRO, 2010e).

For the community, CSIRO offers various Holiday Activities that change with each holiday but include three topics per day (CSIRO, 2010d). These programs are designed to spark an interest in science. By practicing science outside of their school classroom in a hands-on and positive environment, children build on their life-long, science learning experience. These programs address CSIRO's hope of impacting the students to become enthusiastic about learning science.

The programs offered during the summer holidays are also designed to make science enjoyable for children. The Holiday Activities were offered at four sites in Victorian in 2011; Highett, Glen Waverley, Yarraville, and Kew. At Highett and Kew, a day consisted of the three programs: Survival Science, Under Pressure, and Healthy Heart. At Yarraville and Glen Waverley, a different trio of programs was offered: Circus Science, Brain Teasers, and Imagine Images. Survival Science demonstrated the importance of water, keeping warm, and direction when lost in the wilderness. Under Pressure explained how air is always applying pressure on us, and also helps planes fly. Healthy Heart looked into the anatomy and functions of the heart, and children built their own stethoscope. Circus Science explored the extraordinary science behind circus tricks such as juggling balls and spinning plates. Brain Teasers challenged children to solve many types of word and physical puzzles. Lastly, Imagine Images showed how the eye works and how it can be tricked into thinking still images are in motion. In between each program were breaks for morning and afternoon tea. Lunch was also provided for children in the middle of the day. The programs were facilitated by three presenters and one additional staff member; each presenter led one of the three programs. The age groups considered for these activities range from 5-13 years old. The program offered to children from 5-6 years old is called Little Learners. The older participants are divided into two levels, junior [7-9 years old] and intermediate [10-13 years old] (CSIRO, 2010d).

2.2 Victorian Education

CSIRO's Holiday Science Activities do not fall under any national or state mandated standards; however, it is important to understand these curricula, as learning is a combination of experiences in and out of school. This section looks at the new Australian curriculum and the Victorian curriculum. Researching the educational system in Australia allowed our team to understand how holiday programs like CSIRO's fit into the education of a student.

2.2.1 Australia Curriculum

Until 2009, the Australian Government did not have a uniform prep-12 national school curriculum. For the past thirty-five years there have been various attempts to create one; however it was not until about a year ago that the Australian Government began the process of implementing one (Reid, 2005). The first phase of the new curriculum is being developed for English, Science, Mathematics, and History. The goal is to ensure that students are competent in all areas of school so that they are effective and educated Australian citizens (ACARA, 2009). The Australian Curriculum focuses on the prep-10 curriculum. It proposes three standards that each school's science curriculum should implement. First, the science curriculum should give students a strong skill set to prepare for science in upper level schools, such as secondary school and university education. Second, the science taught in classrooms should engage students in order to prepare them to use science in daily life. Lastly, the curriculum should revolve around science understanding, science inquiry skills, and science as a human endeavour to further advance Australian society (ACARA, 2009). The Australian government is aiming to make the Australian curriculum for science and all other subjects universal among states.

2.2.2 Victorian Curriculum

The focus of the Department of Education and Early Childhood Development (DEECD) is to ensure children in the school systems of Victoria succeed. DEECD is the name of the Victorian State Government Educational sector. The DEECD works to provide The Victorian Essential Learning Standards (VELS), the standards that each prep-10 school in Victoria should follow. The VELS guide the curriculum that the schools in Victoria use to ensure that each student in the prep-10 age group develops and progresses in his or her education (Victorian Curriculum and Assessment Authority, 2009). There are six levels of the VELS, which focus on different years at school. Level one is devoted to preparatory grades (kindergarten), while each level from two through six provides the standards for the next two grades in ascending order. In these education standards, science is classified as discipline-based learning and not implemented into the curriculum until level three, or grade three (VELS Curriculum, Victorian Curriculum and Assessment Authority, 2009). With the curriculum being implemented in Australia, science will be brought into children's teaching during their third and fourth year of schooling. By the end of a student's training under the Victorian school curriculum, students should be able to recognize that diverse cultures of people have helped to shape science, recognize that energy can explain phenomena such as

global atmospheric changes and plate tectonics, explain trends in data, and identify how science has had an impact on and been influenced by society (Victorian Curriculum and Assessment Authority, 2009).

2.3 Impact of Science Education Outside the Classroom

Most students learn science in a formal educational setting. They are in classrooms with teachers or professors that have a structured curriculum for their students to follow (Ainsworth & Eaton, 2010). Most students show a high level of interest in science as they make the transition from primary to secondary schooling. However, a large number of students show decreased interest in science education after their secondary schooling begins. This is when the majority of students make decisions about their careers. It is important to sustain the students' interest in science education throughout their schooling. If their interest lies elsewhere, then the students will in all likelihood pursue something other than science as a career (Speering & Rennie, 1996).

2.3.1 Formal vs. Non-formal vs. Informal Education

There are three types of education: formal, non-formal, and informal education. Formal education is very structured and organized. The teachers have a goal for teaching specific material and a structured curriculum they need to follow. Usually with formal education, there is some academic credit awarded once the curriculum is completed. This type of education is typically found in primary schools, secondary schools, colleges, and universities (Ainsworth & Eaton, 2010).

Informal education is the second type of education. It is the opposite of formal education. There is no structure to informal education, and it is often considered to be spontaneous. Also, there is no curriculum. It is viewed as experiential learning and the outcomes vary from person to person. This type of education lacks intention and objectives (Ainsworth & Eaton, 2010).

The third type of education is called non-formal education. It is the middle road between formal and informal education. It can be intentional or established, but these are not necessary requirements for non-formal education. It also does not need to have any affiliation with a school or university. Although non-formal education does not require set standards, it must have some structure. Non-formal education will not award credit (Ainsworth & Eaton, 2010). Figure 1 describes the key attributes of each approach.

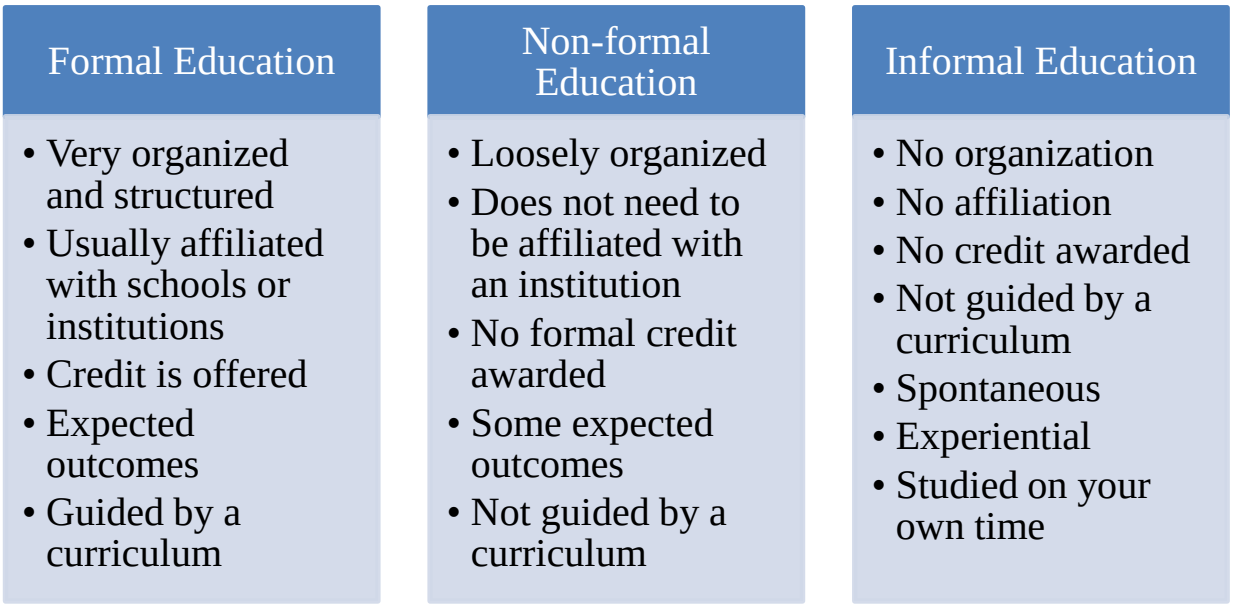

Figure 1: Types of Education

(Adapted from Ainsworth & Eaton, 2010)

CSIRO's Holiday Science Activities are not considered formal education because they are not guided by a curriculum, do not award credit, and do not have any affiliation with a school or institution. They are also not considered informal education because the Holiday Activities do have some structure to them. Therefore, the Holiday Activities are considered to be non-formal education.

2.3.2 Motivation for Hands-on Learning

As students prepare for the transition from primary to secondary schooling, their enthusiasm towards science education is at its peak. It is expected that the hands-on learning they have grown accustomed to increases in secondary schooling. However, students are often disappointed with how science is taught in secondary schools and lose their enthusiasm. An Australian study showed that in primary schooling students enjoyed the work they were doing and found the curriculum interesting. The science curriculum in secondary schools can negatively affect student's views on science. Here, the students considered the curriculum to be uninteresting and irrelevant. This could be caused by the differences between primary and secondary school educational strategies (Speering & Rennie, 1996).

Primary schools take a view on science education that is activity-based and student-centred. On the other hand, secondary schools are more teacher-centred and content-driven. Also, the means by which the curriculum is taught varies from primary to secondary schools. Primary school teachers find that a positive attitude towards science is more important than

science knowledge. However, secondary school teachers believe that knowledge in the sciences is more important than the attitude the students have toward science (Speering & Rennie, 1996). The VELS website shows that there is no set science standard in level one or level two. The first time science education is introduced is in level three, years three and four in school (VELS Curriculum, Victorian Curriculum and Assessment Authority, 2009).

Supporters of hands-on learning believe that this method promotes learning because it incorporates different parts of the brain that textbook learning does not, and it increases interest through motivation and engagement. Conversely, critics believe that hands-on learning is less effective, less efficient, produces irrelevant information, and costs more than conventional science teaching (Klahr et al., 2007). Pine et al. conducted a study that compared the performance in hands-on and textbook-based curricula. Although the study involved four activities that were intended to produce an answer to this debate, the research team found that the two curricula taught the material equally well. There are numerous factors that still need studying and a variety of topics that need exploring before a definitive answer can be reached (2005).

In short, students prefer hands-on learning over textbook studies. They enjoy the student-directed lessons and examining science matters that relate to everyday life. Students are not generally fond of note taking, working from a textbook, and memorization. The change in teaching methods from primary to secondary schooling could be the cause of this dissatisfaction (Speering & Rennie, 1996). The study by Pine et al. shows that hands-on learning is just as effective as textbook learning (2005). If students' motivation towards science education is to increase, then hands-on learning needs to be executed better in secondary education.

2.3.3 Parental Influence on Children's Science Learning

Hands-on learning is a factor in child motivation towards science education; however, this is not the only factor that influences children. Another factor is parental influence. Studies have found that a child is more motivated to succeed in the classroom if there is outside motivation from their parents (Kaya & Lundeen, 2010; Fan & Chen, 2001; Hoover-Dempsey & Sandler, 1995; Frome & Eccles, 1998).

Kaya and Lundeen state that parents who feel intimidated or uncomfortable with science do not reinforce the material at home. Even if they start to emphasize science education, they do not continue for very long because they feel more comfortable with math or reading material. Parents who are exposed to science in a positive manner tend to be more

interested in the material. As a result of increased interest, parents are more comfortable reinforcing science material at home. Kaya and Lundeen conducted a study where they hosted a Family Science Night at two schools to increase science interest in parents and children. The study found that parents were often scared of science because of their experience at school. After participating in the Family Science Night, parents were more interested in science and therefore more comfortable emphasizing science at home with their children (2010).

It is important for students to be exposed to science education throughout their schooling, but reinforcement of the material at home is a critical element to the child's enjoyment in the material. Kaya and Lundeen also state that parental involvement is an important factor in the child's career path in math and science (2010).

2.4 Other Holiday Programs

CSIRO's Holiday Science Activities in Victoria are unique because there are very few science-based holiday programs available to children. There are a variety of programs offered throughout Victoria during the summer holiday; however most of them do not focus on science. Through research and CSIRO's parents' responses, we selected seven other organisations which offered holiday programs. In researching these organisations, we focused on examining programs which were both science and non-science based, had similar age ranges to those of CSIRO, varied in the program length, and varied in price. Table 1 compares these factors. Individual descriptions of each program can be found in Appendix A.

Table 1: Holiday Activity Comparison

	Program length	Days child attends	Price range	Age range	Content
CSIRO Victoria	3-6 hours	1	$45-$90	5-13	Science
Scienceworks	30 minutes (workshop only*)	1	$8	6+	Science
Monash Science Centre	1-2 hours	1-4	$20-$30	5-13	Science
Melbourne Museum	No specified length*	1	$8	None specified	Science
CHIP	10 hours	1-5	$100-$195	5-11	Science*
Heide Museum of Modern Art	1-2.5 hours	1	$30	5-15	Art
Melbourne Zoo	6 hours	1	$58	5-12	Animals
Questacon*	Not specified	1	Varies by program	3-17	Science

*Please see Appendix A for details

The programs will be further assessed through observations and interviews as described in chapter three, Research Methodology.

2.5 Research Surveying

Our project obtained feedback from parents and students that participated in the Holiday Activities. To best understand our strategies for evaluating the programs, we began by describing and comparing various evaluation techniques. A brief portion was devoted to interviewing children, followed by a case study on a series of after school programs.

2.5.1 Strategies

There are many methods by which one can obtain feedback from a sample population. Each survey type is different in its style, purpose, advantages, and disadvantages. This section looks at five different survey methods to determine the appropriate method(s) for our research: questionnaires, interviews, focus groups, telephone interviews, and internet-based surveys.

A questionnaire is an administered survey on paper where questions are presented with multiple-choice or scaled answers provided. Open-ended questions may be included, but usually many are not because they increase the time to complete the survey. The respondent answers all questions to the best of their knowledge and cannot ask questions regarding the survey. Questionnaires are used on large sample sizes or to do a preliminary survey (Gillham, 2005). Because there is no interviewer, the questions must be worded so they produce an appropriate response. Gordon B. Willis states that even simple questions such as, "Do you own a car?" are too vague because a person could answer "no" if they lease a car or if they own a truck (2005). Therefore, questions must be specified so only appropriate responses will be received. The format of a questionnaire is standardized. This makes response time fairly quick.

An interview is administered verbally, typically in a face-to-face conversation. The length of an interview is often longer as more open-ended questions are asked and responses are detailed. An interview would be used when a survey wants to produce more in-depth results than a questionnaire (Gillhan, 2005). Questions must still be worded carefully, but because answers are not always preset, the interviewer can easily clarify or ask supporting questions to reinforce an aspect of the survey. Interviews may be standardized like a questionnaire, but other strategies are often used instead. For example, an interviewer may use a think-aloud technique where the respondent is asked to vocalize their thought process while answering a question, or verbal probing where the interviewer asks a question in immediate response to an answer (Willis, 2005). Both of these techniques are easy to use and provide more extensive responses.

Focus groups are a moderated interview with a group of similar people. The set of subjects can vary from four to ten individuals based on the topic and setting (Willis, 2005; Greenbaum, 1998). The focus group is more of a discussion between the subjects where the moderator keeps the conversation on track with the topic. A focus group tries to answer a single question or narrow topic in this discussion setting. Often, the group discussion is recorded so the responses of the group do not have to be quickly written. However, this may not be reasonable as an acoustically poor room or bad recording device can make the recording incoherent (Gillham, 2005). Willis suggests that a focus group has a narrowed topic since fewer questions can be asked (2005). Gillham agrees, but also implies that broader topics can also be discussed when used as an "exploratory study" (2005). However, focus

groups take time to assemble the subjects and thoroughly discuss a topic, and they cannot be used for quantitative research (Greenbaum, 1998).

Distance methods such as telephone, email, and internet surveys allow the sample to respond to the surveys from anywhere they can use a phone or computer. These methods are not preferred and should only be used when the previously mentioned techniques will not work. The surveys are often standardized and shorter than face-to-face interviews because all distance methods involve a less personal communication. Telephone interviews still allow for communication between the interviewer and respondent; however, the increased number of large-scale corporate surveys has caused many people to view telephone interviews as a disturbance (Greenbaum, 1998). The standardization on the survey prevents telephone interviews from encouraging in-depth responses (Holstein, 2003). Internet and email surveys are increasingly popular and allow a standardized survey to be completed at any time, but there are some disadvantages of using this technology. Because email can be an informal form of communication, Gillham suggests that an email survey produces a response that is too casual (2005). The largest problem with electronic surveys is that many people do not have access to or choose not to use the internet (Solomon, 2001; Zhang, 2000). This limits the sample and may cause a bias. Zhang predicts that as technology continues to improve, this bias will disappear, but for now these interview methods must be used with caution (2000). It has been ten years since Zhang's article was written; however, some communities still do not rely on computers as much as others. Therefore, a community should be assessed for computer reliance before an internet survey is implemented.

One method will not satisfy all surveying challenges. The method must be selected based on the objective of the survey, setting, and sample size. Techniques may be combined to provide a wider range of content. For example, a questionnaire could be combined with an interview aiming to get answers from the questionnaire, and the reasons behind the answers in the interview. Interviews may also be combined with observation where the interviews serve as a clarification of the participants' thoughts during the program (Gillham, 2005).

Because our project included speaking with children, the differences in interviewing children from adults were accounted for. Questions directed towards children should not resemble any questions that could be asked in a classroom setting to prevent children from answering what is expected of them as opposed to what they actually think (Holstein, 2003). Mauthner, Punch, and Holstein all agree that group interviews work more effectively with children, especially young children. This allows them to feel more comfortable because they

will be with their peers. The overall goal is to make the children feel comfortable so they will be willing to talk to a complete stranger (Mauthner, 1997; Punch, 2002; Holstein, 2003). "The challenge is to strike a balance between not patronising young people and recognizing their competencies but maintaining their interest and keeping the research familiar and relevant to them" (Punch, 2002, p. 54).

2.5.2 Evaluation Case Study

The Southwest Educational Development Laboratory (SEDL) evaluated twelve after school programs in Texas. These programs aim to provide enhanced education to mediocre performance schools according to state standards (SEDL, 2006a). While these programs differ from CSIRO's Holiday Science Activities they are still a supplement to formal education and can be assessed similarly. SEDL aimed to assess the programs through a three-step process: observations of the programs, interviews with directors and coordinators, and surveys for staff, students, and parents. The programs were then cross-analysed to determine best practices that could be implemented into other after school programs (SEDL, 2006b).

The results of the assessment showed that the programs which yielded higher rates of student and parent satisfaction had seven common characteristics. Some of these characteristics were: a variety of academic practices including hands-on learning, a positive atmosphere for learning, a strong relationship between staff and students, and parental awareness. SEDL viewed these programs as potentially successful as a supplement to formal education. The common characteristics exhibited by these programs were recommended for other after-school programs in Texas (SEDL, 2006b).

2.6 Segments of the Community

In order to examine the science and technology interest of the Victorian community, we studied a report called *Community Interest and Engagement with Science and Technology in Victoria* from the Victorian Department of Innovation, Industry, and Regional Development. This report found that 65% of the Victorian community are interested in science and technology, leaving 8% of the community neutral, and 27% of the community uninterested. These groups are further broken down into six different segments to identify their level of interest in science and technology, their motivation and ability to find information, and whether they understand what they are finding (Quantum, 2008).

Segment 1 makes up 23% of the population and includes people who are interested in science and technology, but do not actively search for information related to the subject.

These people are excited to be informed of new and popular subjects, but are not passionate about science overall. They are easily identified because of their sudden interest in a popular subject, or a subject that may benefit their family. After absorbing as much information as needed, they return to their normal life. Overall, Segment 1 includes the oldest range of people, usually with no dependants, and consists of the highest proportion of retirees. This segment is almost evenly split as to whether they find science difficult to understand or not. Out of the three segments of people who manifest an interest in science & technology, Segment 1 is the least excited about the subject matter. This group has a high population of people that appreciate new technology and devices but are not likely to be the first to buy a new device. They are happy to accept or ignore information when it is about science and technology (Quantum, 2008).

Segment 2 makes up 27% of the population. This segment includes those who are interested in science and technology, can search for it, and understand it. Out of all six segments, they are the most engaged and involved in the topic. Interest comes from early involvement, most likely from their teenage years. Most work full time and have the highest level of science and general education. Usually enjoyment from science comes from working in a science related field or reading information about science and technology. Many people in this segment attend museums, libraries, zoos, botanical gardens, and art galleries in their leisure time. They believe they understand science and feel well informed but are always on the lookout for additional information. Almost everyone in this segment agrees that science and technology is beneficial for their family, and for solving societal problems. Generally, these are the people who want to be first to get a new device. People in Segment 2 are driven to convince people to better appreciate science (Quantum, 2008).

Segment 3 makes up 16% of the population and consists of people who are interested in science and technology, actively search for it, but are unable to find or understand it. This group is the second most engaged segment. It is also seen that interest starts early as with people in Segment 2. People in Segment 3 are the most likely to think media does not provide sufficient information. Their ability to understand the information is limited, yet they take pleasure in science-related reading, visiting museums, and watching documentaries. Their desire for more information is visible, but would be heightened if the available information was less technical. It is not necessary for these individuals to have latest technology at hand. Science interest would be boosted if explanations were simpler, clearer, and relatable to every day experiences (Quantum, 2008).

Segment 4 makes up 8% of the population and encompasses people who are neutral towards science and technology and not interested in looking for additional information about either. The report notes that this group neither has a strong interest nor a disinterest in science and technology. This segment can be involved with science, but does not feel a need for involvement. The group consists of people who are more likely to be employed part-time as compared to the general population. Their likelihood of researching and reading scientific information is less because their interests are elsewhere. Science does not relate to their everyday life style and behaviour. They are the least likely to buy a new technology; but they do not hate technology; they just are not interested in it. Motivation for a better learning experience is limited because they are not stimulated to learn more about science (Quantum, 2008).

Segment 5 is comprised of 19% of the population. People in this segment are uninterested in science and technology and do not look for more information on the subjects. They are the least likely segment to immerse themselves in science and technology based activities. The group tends to be students and people earning $40,000 a year or less. As teenagers, this group of people did not exhibit an interest in these subjects, thus stunting their current curiosity as adults. People in Segment 5 consider themselves the least informed and struggle to understand science-based material. Information transmitted through media does not aid their understanding about the subject. They do not care how things work as long as they function correctly. People in this group tend to think technology has gone overboard, thus do not care to acquire the latest technology. It is hard to convince people in Segment 5 to change their current opinion about the matter (Quantum, 2008).

Segment 6 contains the remaining 8% of the population, including those who are neutral towards science and technology, but actively look for information regarding both. When they find information they may or may not be able to understand it, if they are even able to find the information. This is the youngest segment encompassing a population between the ages of 18-34 who work part time jobs and most commonly live in the outer suburbs of Melbourne. Their science-based leisurely activities extend to visiting the zoo and wandering around the botanical gardens. This group is classified as having a moderate interest in technology and search for information even though they are not necessarily interested in it. About half the time, people understand what they are reading but they obtain most of their information through media. This group will likely buy new technology as it comes or the market. Some suggest that many of these people are interested in having trendy

technology rather than learning about it. Segment 6 is noteworthy because people are not interested or engaged but still seek more information (Quantum, 2008).

This study formulated a thorough breakdown of the different segments of people interested in science and technology in Victoria. It clearly delineates how each person can fit into a segment based on contributing factors of their personalities and interests. This report will be used to determine the breakdown of CSIRO Holiday Program parents into these six segments.

2.7 Summary

This research has enhanced our knowledge about CSIRO's goals to create an impact within the Victorian community. The organisation focuses on delivering basic science education to primary and secondary schools. To understand CSIRO's role in science education in Victoria, we researched the science curriculum of Australia as well as the differences between non-formal, formal and informal education. CSIRO's Holiday Science Activities do not follow a set curriculum, thus are referred to as a non-formal type of education. Additionally, the Holiday Activities are designed to enhance children's exposure to science by providing hands-on activities. Studies exploring hands-on learning have shown that it is as effective, if not more so, than textbook learning. To form a comparison to CSIRO's Holiday Science Activities, we researched the holiday programs offered by various organisations throughout Victoria. To formally assess the Holiday Activities, we examined a diverse range of methodological approaches that assisted us in the design of our methodology. These approaches aided in our understanding of how to obtain both qualitative and quantitative data. Through the use of these methodological approaches and the data collected, we measured the impact and success of CSIRO's Holiday Science Activities. The methodological approaches utilized can be found in the following chapter.

Chapter 3 Methodology

Our project goal was to assess CSIRO's Holiday Science Activities by determining parental and child satisfaction, analysing other holiday programs, determining the reasons why parents' enrol their children, and shaping improvements that could be made to CSIRO's Holiday Science Activities. Through this, the project also examined the programs' impact on the students. We collected data in a five-step process consisting of a pre-program survey distributed to parents, observations of students taken during the activities, a post-program telephone interview with parents, an assessment of other holiday activities, and interviews with CSIROSEC staff.

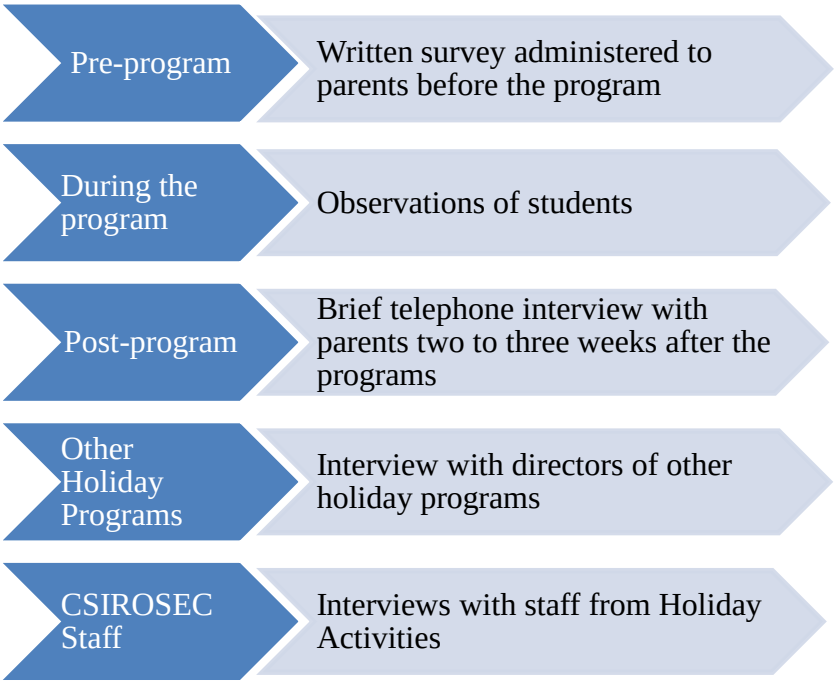

Figure 2: Five Steps for Data Collection

Analysing these data in conjunction with our literature review allowed us to answer some of the questions that interest CSIRO:

- Why do parents bring their children to CSIRO's Holiday Science Activities?
- Do the programs have an educational impact on the children?
- What other holiday activities are available to children and how do they compare to CSIRO's Holiday Science Activities?
- Are CSIRO's Holiday Science Activities satisfying parents and children?
- What improvements can be made to the Holiday Activities?

For each step of our data collection, we tried to minimize variables that could have caused errors in our results. Each day of the Holiday Activities was unique because the children were different each day, the presenters sometimes changed, the order of activities varied, and sites were set up in different ways. To isolate these variables, we made sure to date each survey and note the site where it was filled out. Also, our interview questions were designed to prompt accurate answers instead of responses that the interviewees thought we wanted to hear. These actions prevented sources of error from diminishing the quality of our data. The following sections detail each step of our data collection, showing the design and implementation.

3.1 Assessing Parental Motivation

The first step of data collection, the pre-program survey, focused on determining the motivation for bringing a child to CSIRO Holiday Activities. The written survey began with a short demographic section to determine the scope of the current population, what relationship the accompanying adult had with the student, what sector they work in, etc. A subsequent portion about interest in science and technology allowed us to see if the parents are aware and curious about science. We also segmented the parents into the six community segments as described in the Literature Review. The last five questions asked general information such as how many times the child had previously attended CSIRO's Holiday Science Activities and how the parents heard about the programs. The end of the survey asked if the parent would be willing to have a phone interview 2-3 weeks after the program in order to gain their feedback. We assured each participant that the surveys were completely confidential.

The survey was distributed before the program. After the parent registered their child, one of the team members spoke with him or her and presented the survey. The survey was designed to take five to ten minutes so we did not delay any parent's schedule. If a parent did not have time to fill out a survey, they either took it home to bring it back in the afternoon, returned it via email, or opted not to take it at all. To be prepared for many parents entering with their children at once, we were equipped with plenty of writing utensils, clipboards for writing, and a designated sitting area. Team members handled logistical issues that arose, and were available to answer any questions that the parents asked.

We obtained 124 surveys. Of these 124 surveys, we selected 46 parents to contact for a post-program phone interview and interviewed 36 of those selected. The procedure for this portion of our data collection is outlined later in this chapter.

The data collected in the pre-program survey were used to determine the motivation for parents to bring their children to the program. The data were mostly quantitative; however, some questions were open-ended yielding qualitative data. The full survey may be found in Appendix B.

3.2 Observation of Children

The second step of our data collection included observing the students while they were participating in the Holiday Activities. CSIRO wanted us to determine the impact their programs have on the students. This task required us to observe the students and take notes on their behaviour. We looked for behavioural cues that indicated interest or boredom.

During the first two days of the programs, we tested our pre-program survey and observation chart. Initially, we asked the children questions individually during morning tea, lunch, or afternoon tea. This process was satisfactory, but we enhanced it by asking the entire group at once. As a result of this modification, we received full participation from the students in a more effective manner. A few examples of the questions we asked were:

- What is your favourite subject in school?
- Are you enjoying the program?
- Have you attended a CSIRO Holiday Activity before?
- What do you want to be when you grow up?

We noted all behavioural cues using an observation chart (see Appendix C). Some signs of interest were as simple as paying attention to the instructor or asking questions. A few cues that indicated boredom were lack of attentiveness and little participation. We also created a section at the bottom of the chart for any additional comments that arose that did not fit into a category on the observation chart. This chart helped us determine if the children viewed the Holiday Activities as entertainment and educational, or boring and uninteresting. Every day, a set of observations was recorded by each team member. At each site, there would be a total of two sets of observations on any given day, except for the last day where there were four sets of observations.

To simplify our observations, we focused on observing the class as a whole. Since there were about 25 students per group, keeping track of every child would have been difficult. Despite this challenge, the observation period was critical to our analysis of CSIRO's Holiday Science Activities and needed to be performed thoroughly.

3.3 Assessing Program Impact on Children

A few weeks following the completion of the programs, we conducted a post-program survey consisting of telephone interviews with parents who provided contact information on the pre-program survey. The interview was designed to gain more insight about the program's impact on the children.

We asked questions to the parents regarding their satisfaction and their child's satisfaction towards the Holiday Activities. The one-on-one conversations with the parents revealed their perspective of the educational outcome of the programs. A portion of the interview questions focused on determining a noticeable difference in the child's interest in science as a result of attending the Holiday Activities. Additional questions served to further investigate their reasons for choosing CSIRO's Holiday Science Activities. Responses obtained were then used to draw conclusions about the child's participation in the program.

Parental consent for the post-program phone interview was greater than expected; thus, we were faced with the issue of selecting which parents to contact from the entire sample. The sample pool was narrowed by choosing a number of surveys that would accurately represent the entire population. Criteria were set in place to focus our interviews on a set sample. This mainly included identifying specific answers to the surveys. We then compiled a back-up list in case we were not able to interview a sufficient number of parents from the representative groups. Further, although rare, challenges we faced included parents not answering the phone or treating the call as an inconvenience. The information gathered from this process helped us understand the factors that influence children to become active in science education. The post-program interview questions can be found in Appendix D.

3.4 Assessing the Competition

We also assessed other holiday activities that have similarities as well as distinct differences to CSIRO's Holiday Science Activities. The goal of this step was to compare CSIRO's Holiday Science Activities to these other programs. From online research and with the help of CSIRO staff, we identified a variety of other holiday programs. To supplement this research, we used our pre-program parental survey to request their knowledge of other holiday activities. The list of programs was split into science and non-science based programs and prioritized by the number of times it was mentioned by parents.

We interviewed with the program directors of the seven other holiday programs listed in our background chapter. Three of the seven programs were observed during the holidays. Ideally we wanted to observe a variety of these activities, but most of them ended before our

schedule allowed us to observe them. The majority of the school holiday was devoted towards evaluating CSIRO's Holiday Science Activities. However, we did observe a few programs before the school holiday ended in early February. To supplement these observations, we interviewed program directors or staff. We used interviews because our sample size was small and we asked mostly open-ended questions.

These interviews ascertained the content of the programs, exposed goals and objectives, and determined the success of the programs. Also, we tried to see if parents were satisfied with these programs through the view of a program director. We were careful to note that the view of the director could be biased towards positive feedback. The assessment of external holiday activities helped us to recognize possible improvements that could be made to CSIRO's Holiday Science Activities. The semi-structured interview can be found in Appendix E.

3.5 CSIRO Staff Interviews

The last step of our methodology was to interview CSIRO staff that worked the Holiday Activities. We interviewed the staff because many of them have instructed the programs for multiple years and have experience working for other holiday programs. Through these interviews, we discovered possible improvements that could be made to the programs in terms of participation, strengths, and weaknesses. The interviews assisted us in our assessment of other holiday programs because many staff members could make comparisons between CSIRO and the other programs.

For our interviews, we chose four staff members who were full time CSIRO employees. We picked the four staff members based on their experience working for CSIRO and working in science education. These one-on-one interviews provided us with opinions on CSIRO's Holiday Science Activities from a different perspective. They also improved our understanding of some of the other holiday programs in the area.

3.6 Data Analysis

The data from all five steps were analysed separately. In our data, "n" is the sample size of the sample or the number of observations we collected. To analyse our data on the pre-program parental survey we used the Wilcoxon Two Sample Test. This test ranks two samples of varying sizes together and determines if there is a significant difference between the samples. We used an online calculator which calculates a probability, "p". This value of "p" was that compared to the alpha value .05. The alpha value is the level of confidence that

we can say a hypothesis is true. If “p” < alpha then we can say with 95% confidence that there is a significant difference (Statistical Tests, n.d.).

Trends were noted by comparing results from different steps. For example, we used the data from observations and post-program telephone interviews to determine if there was an educational impact on children. These correlations were used to answer the questions outlined in the beginning of this chapter. With this, we were able to present to CSIRO our assessment and recommendations on how to improve the Holiday Activities.

Chapter 4 Holiday Science Activities Assessment

This chapter will detail our assessment of CSIRO's Holiday Science Activities. First, an overview of data collection outcomes will be presented followed by a description of our respondents. Next, applicable data from our five methodological steps will be analysed to address the following objectives:

- Determine the reasons parents bring their children to CSIRO's Holiday Science Activities
- Determine parent and child satisfaction
- Examine the impact of the Holiday Activities on children
- Assess other holiday programs in Victoria

Finally we will discuss the successfulness of CSIRO's Holiday Science Activities.

4.1 Data Overview

The following table shows the number of pre-program surveys we collected from parents each day at CSIRO's Holiday Science Activities, and the number of follow-up interviews conducted with the survey respondents.

Table 2: Holiday Program Data Summary

Site	Date	Age Group	Number of Children	Number of Surveys	Number of Interviews
Glen Waverley	13/1/11	Juniors	25	15	3
Glen Waverley	14/1/11	Juniors	26	14	3
Highett	13/1/11	Juniors	22	5	1
Highett	14/1/11	Juniors	26	11	5
Highett	17/1/11	Little Learners	25	15	4
Kew	17/1/11	Intermediate	23	8	3
Kew	18/1/11	Juniors	26	13	2
Kew	19/1/11	Juniors	23	12	4
Kew	20/1/11	Little Learners	22	13	5
Yarraville	18/1/11	Intermediate	11	5	2
Yarraville	19/1/11	Juniors	25	14	4
Total			254	124	36

4.2 Demographics of Children and Parents

An important goal of CSIRO's Holiday Science Activities is to reach a wide variety of children, encompassing many different communities and backgrounds. While it is essential that their programs are available and appealing for all members of the community, it was necessary to determine the audience that CSIRO is mainly reaching.

The first question on the pre-program survey asked the relationship of the person filling out the survey to the child that he or she was dropping off. We did this so that we could primarily focus on the parents, as opposed to grandparents, nannies, etc. Surveys completed by persons that were not parents, (16) were eliminated from the study. The results are shown in Figure 3. Mothers filled out 65% of the surveys. An additional 15% of respondents identified themselves as a parent, but did not specify their gender.

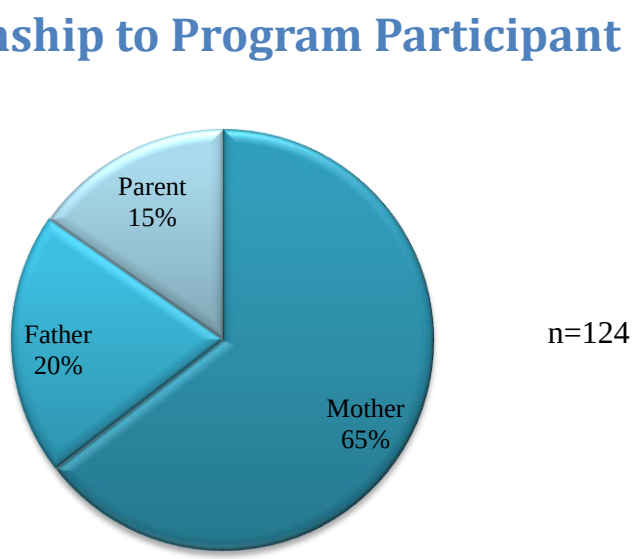

Figure 3: Relationship to Program Participant

The next two questions on the survey asked the parents for their highest level of education. We found that 65% of the parents had a postgraduate degree and 23% of them had an undergraduate degree. This is much higher than the state of Victoria average; according to the 2006 census, only 20% of the population had an undergraduate degree or higher (ABS, 2006). The following question asked the respondents for their highest level of science education. From this we learned that 29% had a postgraduate degree in science and 21% had at least an undergraduate degree in science. These two survey questions showed that the

parent were highly educated overall, specifically in science. Figure 4 below shows the general and science education of the parents.

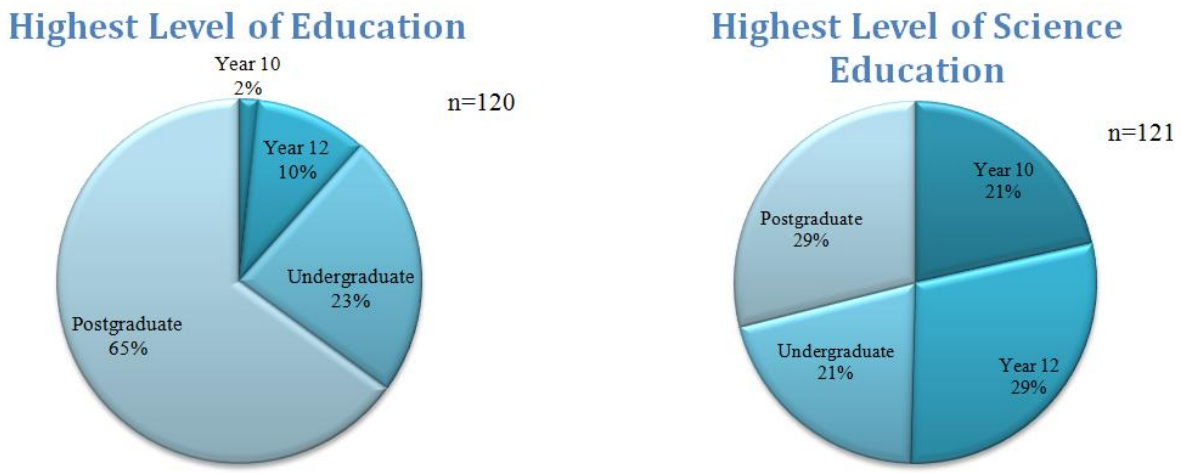

Figure 4: Highest Level of Education

We determined the science interest of parents by looking at their responses to questions six through nine in the pre-program survey. Based on the report *Community Interest and Engagement with Science and Technology in Victoria*, we collaboratively segmented them into six groups. The descriptions of each segment can be found in the Chapter 2 Literature Review. Figure 5 details the percentages of each segment for the parents that brought their children to CSIRO's Holiday Science Activities. Next to this chart is the segmentation for the Victorian community.

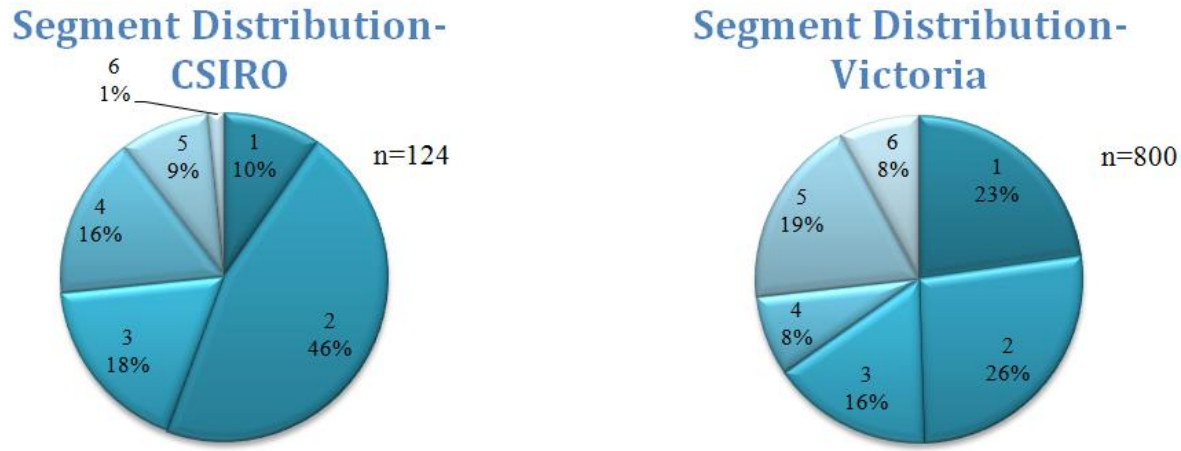

Figure 5: Segment Distribution of CSIRO and Victoria (Data from Quantum, 2008)

Because CSIRO is attracting more parents from Segment 2 than any other segment, we can infer that CSIRO's audience consists of parents with science interest. Based on information obtained from our pre-program survey, we can say that many of the parents also look for science information, can find it, and understand almost everything they find. However, this is logical because the parents are also very well educated. Therefore, they are more likely to be interested in science and want to search for information. We can also conclude that CSIRO is not attracting parents from Segments 5 and 6. These segments should be targeted if CSIRO wants to attract families of all levels of science interest.

To follow up with these questions, we asked the parents to identify the sector in which they work. The majority of parents worked in the educational sector, followed by health, home duties, and science and technology. Figure 6 shows the breakdown of parents' work sectors.

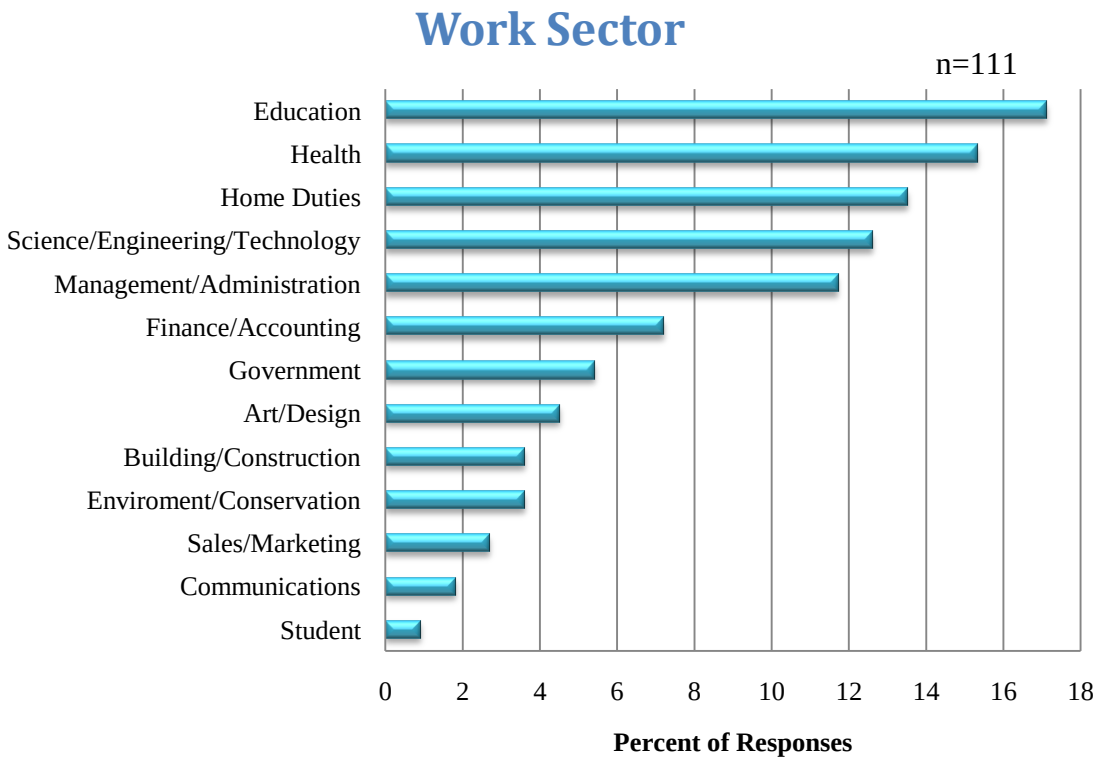

Figure 6: Parents' Work Sector

A wide variety of people bring their children to the program. From the post-program interviews, we noted that a substantial number of people had a spouse that worked in a science-related field. Thus, many families have some science influence from the parents' occupations which could factor into the child's science interest. It could also show that

parents who are interested in science are looking for science-related programs for their children. Many children attending the Holiday Activities have not been exposed to science in school, as science does not appear in the Victorian curriculum until level 3 (Victorian Curriculum and Assessment Authority, 2009). So, if they express interest in science, they are getting it from other influences. Our literature review reveals that if a parent works in a science-related field or is interested in science, then the child may be more likely to have an interest in science, a finding that appears to be reflected in our data.

From the surveys we discovered that about 63% of the children lived within 10 kilometres of the program site. This shows that parents do not travel very far to go to the activities. In the post-program phone interview, we learned that many parents were willing to travel farther in order to attend a program. Figure 7 below shows how far parents travel to the Holiday Activities.

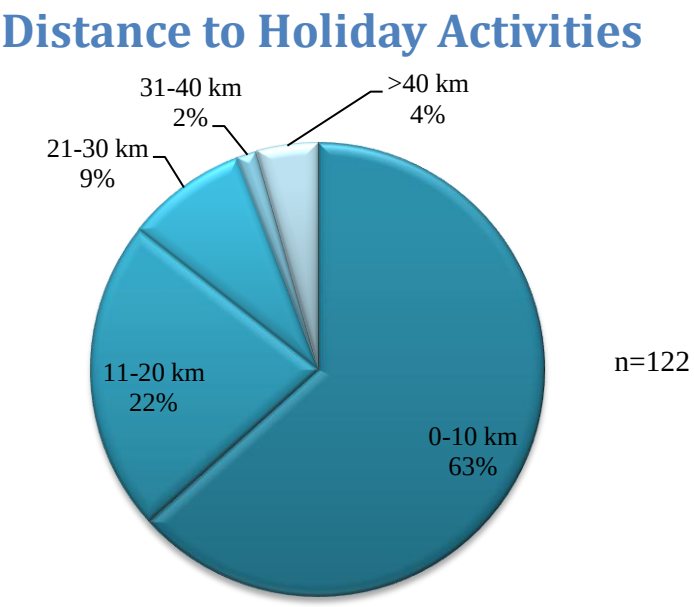

Figure 7: Distance to Holiday Activities

Using these data, we identified geographic holes between the current sites. The map in Figure 8 shows the areas around Melbourne that are geographically ideal locations for new program sites. These areas include Dandenong, Manningham, Broadmeadows, Melton, and Western Wyndham. The centres of these areas were well outside the 10 kilometre range of the current sites.

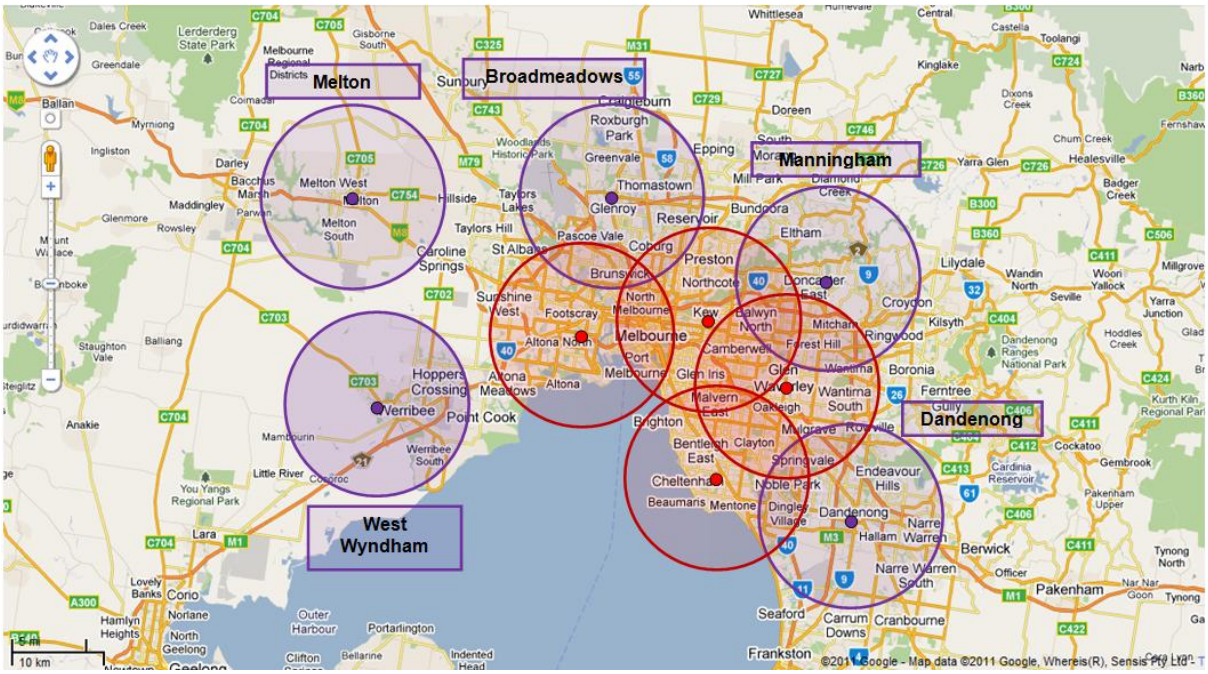

Figure 8: Current and Possible Future Activity Locations with 10 Kilometre Radii

Once we established where a new site could be located, we looked into the population of each area according to the Australian Bureau of Statistics. We took the total number of people living in the majority of the postcodes and added them together. This way, we could get a rough estimate of the number of people who live within the 10 kilometre radius of that site.

Next, we compared the possible program sites to one of the current sites, Yarraville. Through our interviews with the CSIRO staff, we found out that Yarraville is the most difficult to fully book. It is because of this that we felt Yarraville was a good comparison to the possible site locations. The comparison factors can be found in Table 3.

Table 3: Demographics of Possible Sites (ABS, 2010b-ab)

Location	Population	Percent Ages 0-14	Number of Children 0-14	Average Wage and Salary Income
Dandenong	137,600	18.7%	25,774	$35,882
Manningham	118,544	16.4%	19,437	$48,816
Broadmeadows	117,490	20.4%	23,910	$38,555
Melton	100,000	24.1%	24,061	$41,067
Wyndham West	51,969	25.2%	13,087	$44,963
Yarraville	252,025	18.1%	45,720	$44,132

One or more of the five locations could be implemented as future sites if CSIRO chooses to expand. Because three of the four current sites are to the east of Melbourne, we suggest that a site be opened up to the west or the north. Some parents also suggested opening another site to the west of the city. Further suggestions for implementing a new site will be discussed in the Conclusion and Recommendations chapter.

Based on the information from our pre-program and post-program data, it is evident that CSIRO's Holiday Science Activities appeal to an educated and science interested population in the local area of the program site. Because the Holiday Activities usually book out with little external marketing, it is unlikely that the demographics of the participants will drastically change without a shift in marketing techniques or a change of location.

4.3 Why Parents Chose CSIRO's Holiday Science Activities

There are many holiday programs available for children throughout Victoria. Various assessment techniques were utilized to determine the factors that affect parents' decisions when selecting a holiday program for their children. These programs were initially identified through questions in our pre-program survey, as well as the post-program phone interview. Results showed that the main reasons why parents chose CSIRO were because of the science content covered, followed by the child's interest in science, and then the organisation's reputation. Figure 9 contains a graphical comparison between the factors that contributed to parents choosing CSIRO's Holiday Science Activities compared to other holiday programs around Victoria.

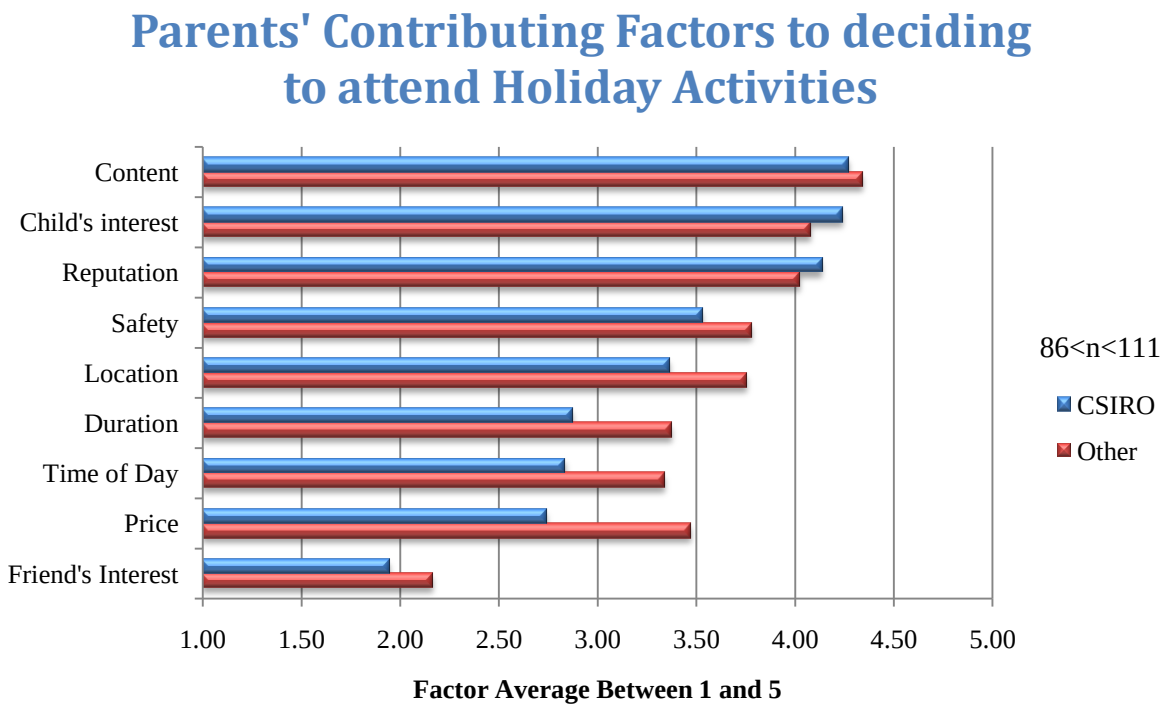

Figure 9: Comparison of Factors Contributing to Deciding to Attend Holiday Activities

The data above represent the average value parents placed on the following factors: program content, child's interest, reputation, safety, location, duration, time of day, price and a child's friend's interest. These factors were rated on a scale from one to five, where one represented no influence and five represented significant influence. It can be said that the parents are looking for a holiday program with educational content about a particular subject matter. CSIRO's activities concentrate on delivering quality science content. The data for CSIRO reflect that the child's interest factor is considerably high, so the children are interested in the science content. This can be supported through conversations with parents in which many stated that their child had an interest in science. When comparing these nine factors affecting parents' decision for CSIRO's Holiday Science Activities and other holiday programs, those that were consistently ranked highly were program content, child's interest, and reputation.

Through statistical analysis, the top three factors were not significantly different for factors to book into other holiday programs. This shows that parents look at similar aspects when booking into all holiday activities. However, we determined that there was a significant difference between the factors location, price, time of day, and duration. These four factors were ranked higher for other holiday programs when compared to CSIRO's Holiday

Activities. From this, we can infer that parents are not as concerned with these factors as they are when booking other programs.

Price was ranked much higher for other holiday programs than it was for CSIRO's Holiday Activities. This shows that current parents who bring their children to the activities are not concerned with the price, either because they think the program provides a good value compared to other programs, or because they appreciate the content in CSIRO's Holiday Activities more than other programs. However, price may have been a more important factor for parents who did not book into the Holiday Activities.

The nine factors were also compared between parents of children that are Double Helix and non-Double Helix members to determine if children that were members were more interested in science. There was no statistical difference in child's interests, but science content and safety were calculated to be significantly different between the two groups. Parents of Double Helix members value the science content of the Holiday Activities more than parents of non-members. This could be because either the parent or the child has an interest in science. We are unsure why safety was ranked higher for Double Helix members, but we think this could be because parents know CSIRO is a reputable organisation and therefore they expect a safer program.

Initial reasons for booking holiday programs were not significantly different for parents of first-time attendees when compared to parents whose children had previously attended CSIRO programs.

4.3.1 Initial Reasons for Choosing CSIRO's Holiday Science Activities

To better understand parents' decision for enrolling their children in CSIRO's Holiday Science Activities, we had to categorize how parents heard about them. This question was featured in our pre-program survey. Figure 11 below depicts the number of parents who heard about CSIRO's programs in the following manners: Double Helix Science Club, previously attended, CSIRO website, CSIRO email, from child's school, from parent's friend, from child's friend, CSIRO mail-out, online search engine, advertisement in *Melbourne's Child,* local newspaper, and CHIP.

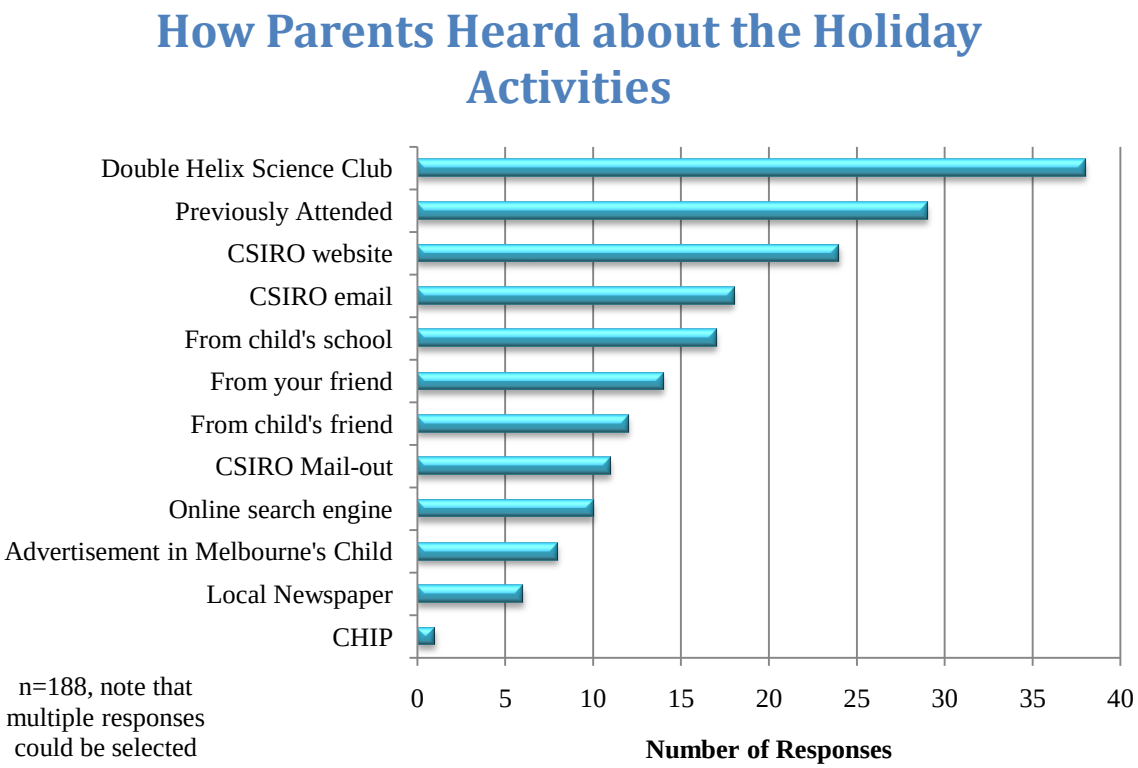

Figure 10: Histogram of How Parents Heard about CSIRO's Holiday Science Activities

CSIRO's Double Helix Science Club and previous attendance were the two top mediums parents heard about the Holiday Activities; out of 188 responses, 38 and 29 responses were received respectively. Twenty-four parents said that they heard about the programs from CSIRO's website. In contrast, the interviews with parents revealed that word of mouth and CSIRO's School Programs were very common ways of informing parents about CSIRO's programs. Other means of advertisement, according to parents, were local newspapers, ads in *Melbourne's Child* magazine, and CSIRO's website. The top two responses from parents who had not brought their children before indicated that they had learned about the program from their friends and from their child's friends. This shows that word of mouth is a common way of bringing in new children.

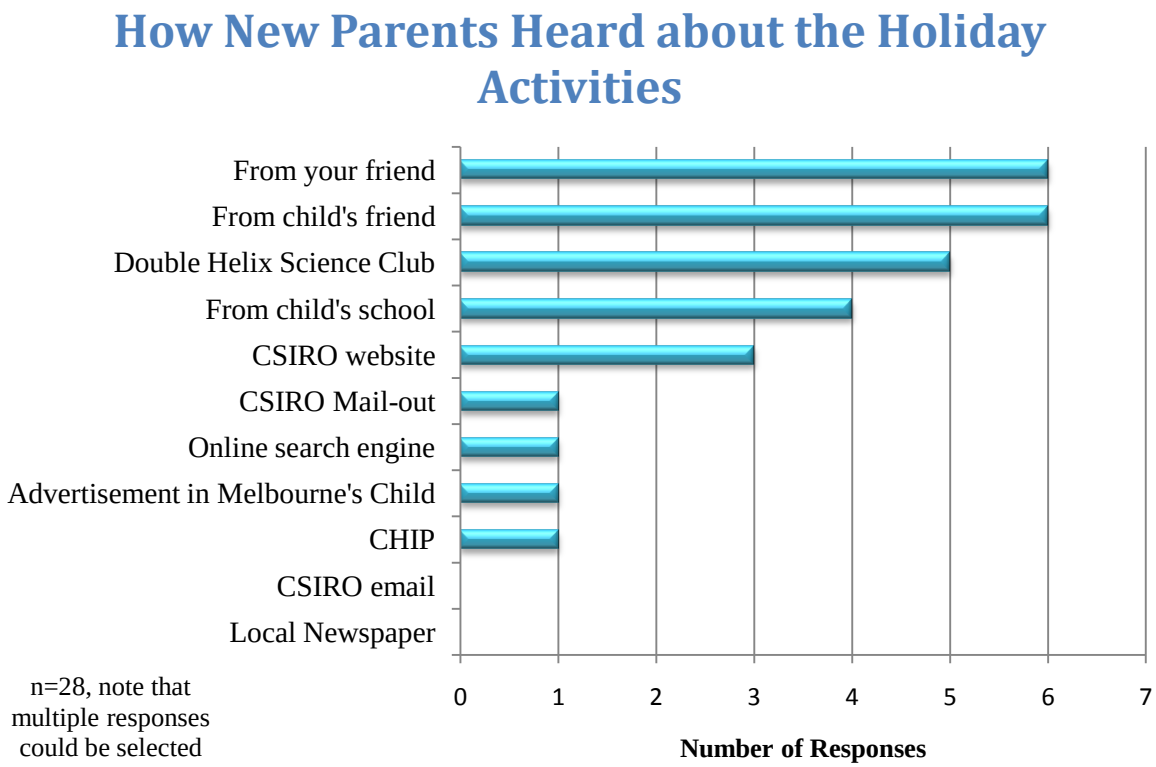

Figure 11: Histogram of How New Parents Heard about the Holiday Activities

4.3.2 Why Parents Return to CSIRO's Holiday Science Activities

If CSIRO is effectively delivering the science content that parents and children want, then it will influence parents to enrol their child again. Figure 12 demonstrates the number of times children have previously attended.

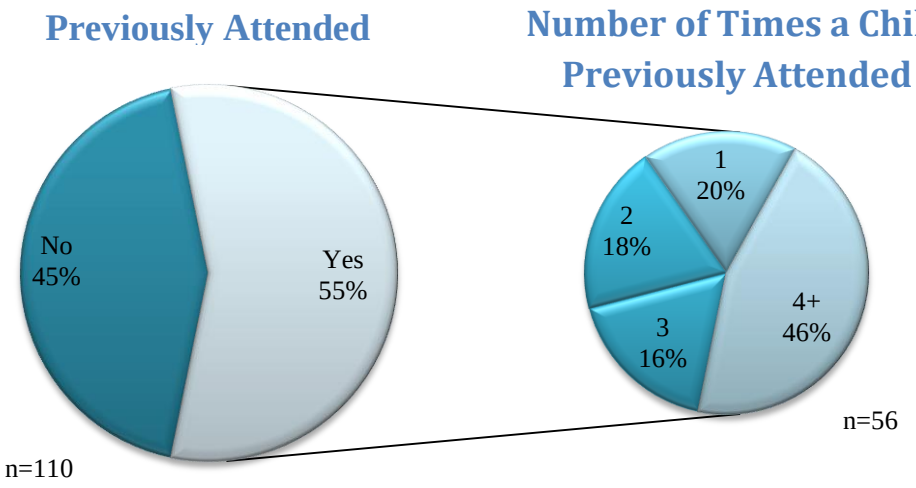

Figure 12: Percent of Children That Have Previously Attended

About 55% of parents responded that their child had previously attended at least one of CSIRO's Holiday Science Activities. This percentage varies based on the age group.

Table 4: Return Percentages of Age Groups

	Little Learners (n=26)		Juniors (n=73)		Intermediates (n=11)	
	Yes	No	Yes	No	Yes	No
#	11	15	42	31	8	3
%	**42%**	**58%**	**58%**	**42%**	**73%**	**27%**

These percentages are understandable because many of the Little Learners could not attend the previous year because they were too young. The ratio of Intermediates is much higher because they could have been attending for at least the past five years. There may be other factors influencing this, but these factors cannot be determined by the low sample size of the Intermediates. The percentage of Juniors who previously attended falls between the percentages for Little Learners and Intermediates. The resulting trend is logical because the older the child, the more likely they are to have attended.

From the post-program phone interview, questions gave us insight on the reasons why parents would consider CSIRO's Holiday Science Activities again. Most of the parental satisfaction was due to the variety of activities offered. More importantly, a deciding factor for most parents was CSRIO's dynamic staff, which enhanced the quality of the experience at CSIRO. The ability of CSIRO's staff to engage the children stimulated them to think that

science is enjoyable. If children find the activities enjoyable then they are more likely to ask their parents to enrol them in the next available program. From parental responses to the post-program phone interview, as well as the results from the pre-program survey, we concluded that a child's opinion about the Holiday Activities sways their parents' opinion on whether or not to book the next program. We caught a glimpse of this in some phone interviews. Often, when we asked the parent if their child enjoyed the Holiday Activities, they responded with a confident yes. One parent added that their child ran up to them with the registration form in hand begging to go back. If the child said that they enjoyed the program, then most parents will look into a follow-up experience.

Results from the pre-program survey revealed that in the case of CSIRO, the most influential factor was the science material covered during the various activities. Most parents viewed the science content as reinforcement to their child's overall science education. The majority of the children who attended the programs are not yet exposed to science in school, thus parents hope to instil a desire to learn science at an early stage. Additionally, CSIRO's staff impact children in such a way that makes the child's holiday experience both enjoyable and memorable. Results from our post-program phone interviews state that the CSIRO staff contribute significantly to the children's enjoyment. We received many comments on how the staff make the activities fun for the children. Also, parents commented that the number of staff present during the programs is a good quality of CSIRO's Holiday Science Activities.

All of the reasons discussed above play a role in parents' decision to return their children to CSIRO's Holiday Science Programs. Results from multiple sources support our claims, as well as offer some insight to recommendations we can present to CSIRO. These recommendations will be discussed in a subsequent chapter.

4.4 Parental and Child Satisfaction of CSIRO's Holiday Science Activities

To determine the children's satisfaction, we asked them if they were enjoying the activities during the day. We received a total of 129 responses and 97% of those answers were yes. Of the negative responses, three changed their minds by the time they entered the third and final activity of the day. This tells us that the activities are entertaining for just about all the children.

We also observed the children's enjoyment. We looked for cues such as excitement to start the activity, sitting up to see the demonstrations, smiling, etc. Out of our 106 observations in the enjoyment section of our chart, 97 of them were positive. This means that 92% of our observations showed the children enjoying the programs.

Conversely, we also observed the children's boredom during the programs. This was determined to be the opposite of enjoyment. From our 73 observations in the boredom portion of the observation chart, 62% showed no boredom and 26% showed little boredom. The remaining 12% of our observations were inconclusive, meaning that we could not tell if the children were bored or if an outside distraction was to blame.

We obtained similar results in our frustration section of our observation chart. Out of our 62 observations, 61% showed no frustration in the activities and 34% showed some with the activities. The other 5% just needed extra time to complete the activity, or they understood it after a second explanation. We propose several ways to reduce the potential for boredom and frustration in the activities in our Conclusions and Recommendations chapter.

One question during the phone interview asked the parents if their child enjoyed the Holiday Activities. Every parent but one said that their child enjoyed the program. The one parent whose child did not like the program said that the child did not feel challenged enough and that the activities were too easy for them. This could be due to the fact that the child was part of the Intermediate group, older, and felt that the activities did not meet his expectations. The majority of parents said that they liked the programs because they were practical, easy to understand, and integrated hands-on activities into the programs. A complete breakdown of the parents' responses can be found in Figure 13 below.

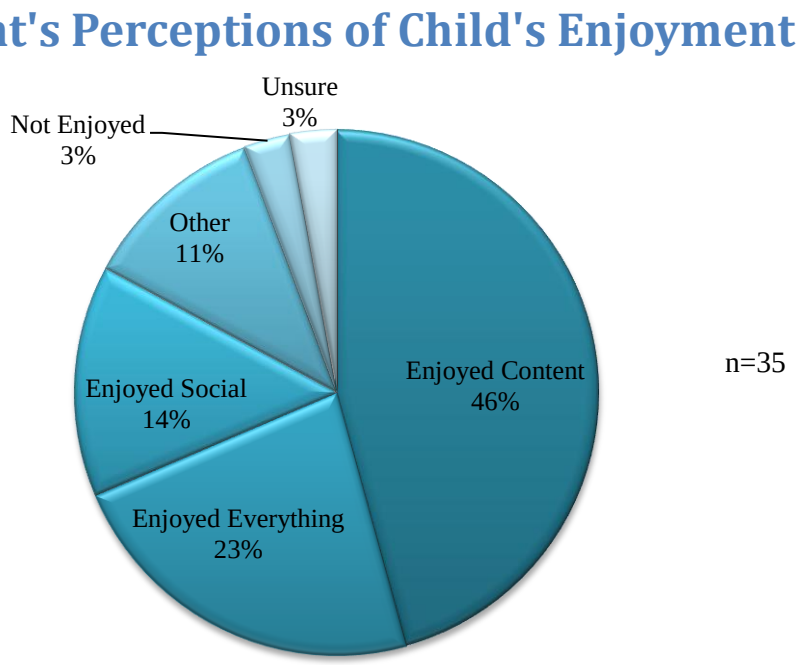

Figure 13: Parents Responses toward Child Enjoyment of the Activities

Almost half of the responses made reference to the content of the activities. An additional 23% of the parents said that their child liked everything about the program. The third highest response that parents gave, 14%, made reference to some social aspect of the programs.

The CSIRO staff also believes that the children enjoy the activities. It is their opinion that the children enjoy the programs because of the high return rate. Children would not return if they were not having fun, so they must be pleased. CSIRO appears to be satisfying the needs of almost all the children involved in their Holiday Activities. The data we obtained through talking with the parents, interviewing the staff, and observing the children during the programs suggest that an overwhelming majority of the children do, in fact, enjoy the Holiday Activities.

We also asked the parents if they would recommend the Holiday Activities to a friend. This gave us insight to whether or not the parents were satisfied with the programs. All but three parents said that they would recommend the programs because they liked aspects such as the staff, the quality of the programs, and encouragement of science education. Two parents said that they would not recommend the programs; one parent said that it felt too much like expensive day-care, while the other simply stated her child did not enjoy the program. Another parent remained neutral on the matter by saying that he would not recommend them, yet he would not discourage them either. CSIRO aims to please each child attending the Holiday Activities and will continue to improve through this feedback. A chart showing the parents' answers can be found below in Figure 14.

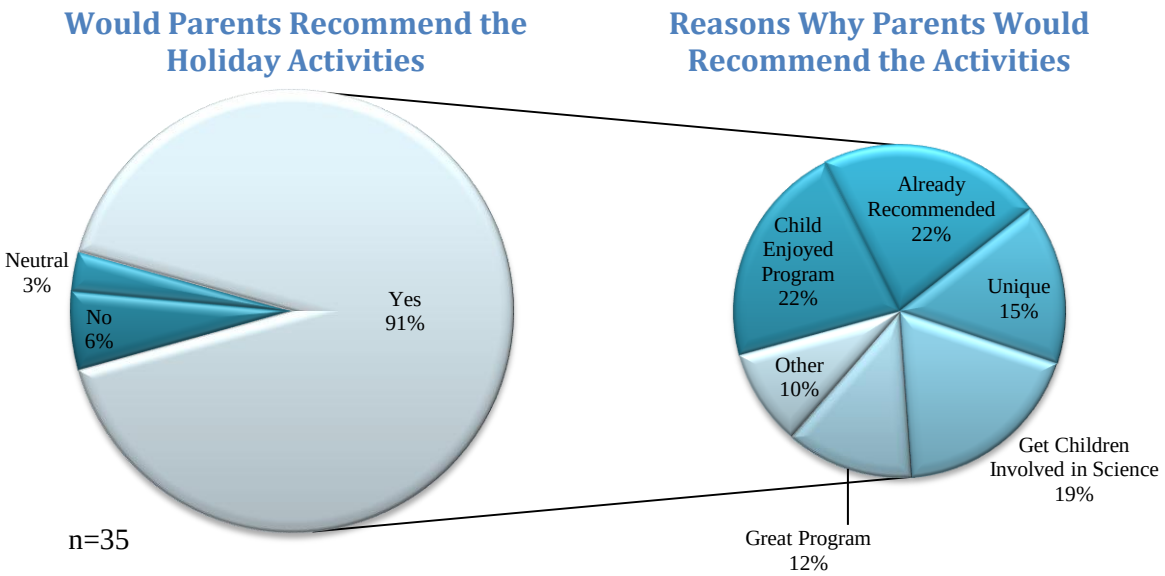

Figure 14: Parents' Responses to "Would you Recommend CSIRO's Holiday Science Activities to a Friend?"

Out of 35 responses, 44% said that they already have, or they would recommend the Holiday Activities because their child enjoyed the program. Another 19% said that the programs are a good way to get children involved in science.

During the phone interviews, we asked parents for suggestions to improve the Holiday Activities. This exposed the weaknesses of the programs from the parents' perspective. It also provided us with information that helped us formulate recommendations for the activities. Our results showed that about one-third of the parents would not change anything about the programs. These parents described the programs as "perfect" or could not think of any improvements. More than half, about 60%, thought the programs were great, but there was room for improvement. These responses were generally minor suggestions. Some suggestions they made included making the programs run for multiple days, making a hand-out for students to take home explaining the items they made, and shortening or lengthening the day. However, there were a few parents who did not like the programs and would recommend significant changes to them. One such recommendation was going more in-depth into activities and doing things that could not be done at home. These responses can be found in Figure 15 below.

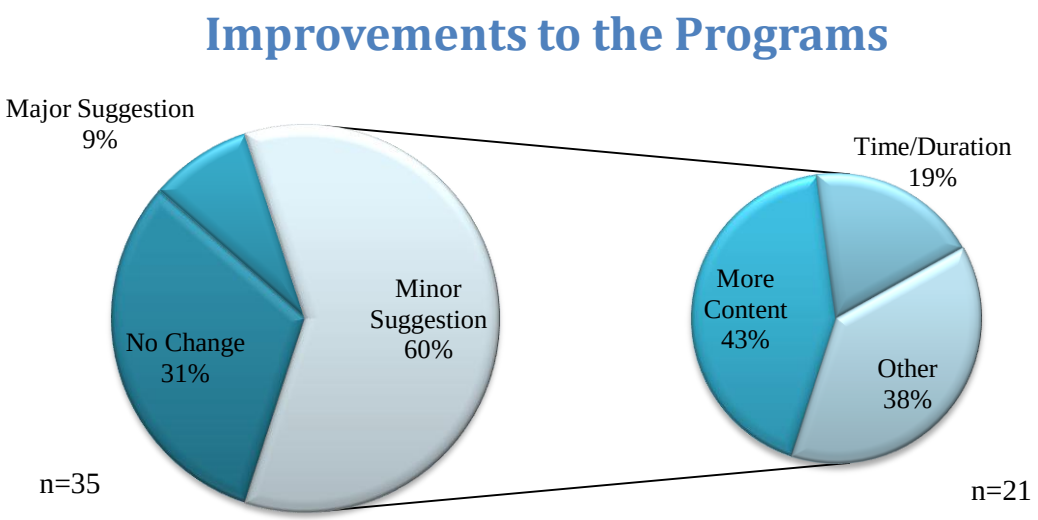

Figure 15: Parents' Suggestions for Improvements to the Programs

About 43% of the responses from the parents who stated an improvement wanted more depth, staff, activities, science content, or more items to take home. We found that about 19% of parents wanted improvements to the time of day the program was run or the

duration. For a total breakdown of responses, please refer to Appendix I.

The CSIRO staff that we interviewed believe that the parents are satisfied with the activities, as seen by the high return rate. The staff felt that if parents were not satisfied with the programs, then they would not repeat booking their children. Also, the feedback they have received from the parents has been mainly positive. Feedback does vary from holiday to holiday, but negative comments arise only in extreme cases.

These results tell us that almost all of the parents and children who take part in CSIRO's Holiday Science Activities are very pleased with them. Yet, there are still some parents whose expectations were not met. Regardless, CSIRO strives to have the majority of parents and children leave with a positive experience.

4.5 Impact of CSIRO's Holiday Science Activities on Children

CSIRO's Holiday Science Activities aim to have a lasting impact on children. To determine the influence they have on children, parents were asked questions in the post-program telephone interview regarding the effect of the programs on their children.

One question we asked parents was if their child had shared their CSIRO Holiday Program experience with others. Many parents stated that their child described the activities in detail, told their friends about their experience, and explained the functionality of the take-home devices. The majority of parents, 88%, stated that their child had mentioned their experience. According to parents, 30% of children spoke to at least one family member about their day. Additionally, when the phone interviews were conducted a few weeks after the program completion, over a quarter of the children were still using the items they made.

Next, we asked parents if they saw an increase in their child's interest in science as a result of their attendance to the programs. Parents commented about how their child had shown a heightened interest in learning how things work. There were very few negative comments. One parent took a neutral stand and stated he was unsure if there was an increase in science interest because his son was too young. Our results can be found in Figure 16 below.

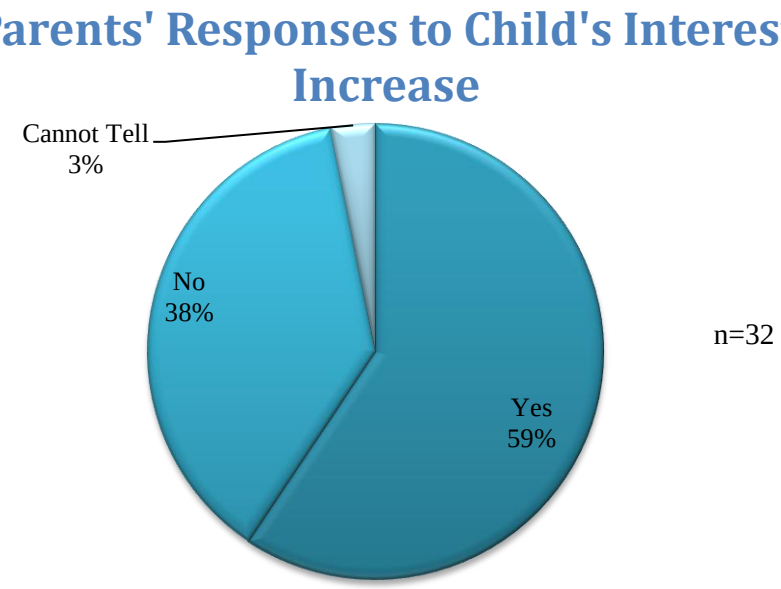

Figure 16: Parents' Responses to Child's Increase in Science Interest

More than half of parents, 59%, said that they saw in increase in their child's science interest after completion of CSIRO's Holiday Science Activities. Although 38% said they did not see an increase, the majority of their children already had a high interest in science and the activities served as a continuation of this interest.

CSIRO's staff expressed the view that an increase in children's interest was difficult to determine; however, after a child completes an activity, if they go home and search for information online, in books, in magazines, or though any available source, this can be gauged as an increase in their interest level. Excitement, on the other hand, is definitely noticeable. The staff defines excitement as children wanting to engage themselves when science is in front of them. CSIRO's staff works to try to excited children about science. If the children are not excited about science, then there can be no interest. In this respect, we believe that they are reaching this goal.

Finally we examined if the parents would consider bringing their children back to the Holiday Activities. Figure 17 below shows the number of parents that plan to re-enrol their children.

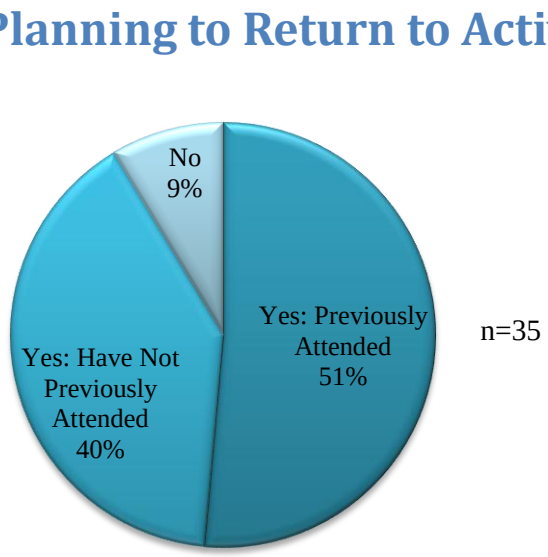

Figure 17: Parents Planning to Bring their Children Back to the Activities

About half of the children whose parents responded positively, 51%, had previously attended the Holiday Science Activities. The 9% of parents that did not plan to return had not previously enrolled their children. Of all the respondents, 91% said that they would re-enrol their child next holidays. Some even said that they already submitted their child's application for the next Holiday Activities. Others said that their child asked them to go back to the programs.

These results show that CSIRO's Holiday Science Activities have an impact on the children who attend their programs; overall, it is a positive impact. We can infer that CSIRO's Holiday Science Activities are triggering science interest in children. The impact of the programs is clearly shown immediately after the programs, but the long term effect is less noticeable. This is supported through our interviews with the CSIRO staff. As stated previously, there is more increased excitement than increased interest. Also, many children do not use the item they created during the programs after a short time. To measure the long term effect, we would have to interview the children after the program's completion rather than only their parents and CSIRO staff. However, the interest and excitement in science shown by these children demonstrates how these programs are essential to promoting and sustaining science as an interactive and fun part of education.

4.6 Holiday Program Analysis

CSIRO's Holiday Science Activities are only one of the many programs that children can attend during the school holidays. Because these activities only last for one day, children

often attend other holiday programs and activities. This can include museum visits, camps, or other day programs. The topics of other holiday programs range from sports to arts, but typically children choose these programs based on their interests. Parents of children who attended CSIRO's Holiday Science Activities rated the child's interest factor as one of the top three reasons for attending a different holiday program. The other two reasons were content of the program and reputation of the provider, the same top three choices for booking into CSIRO's Holiday Science Activities. This shows that CSIRO's Holiday Science Activities are chosen for similar reasons as other holiday programs. Because the CSIRO's activities last only a day, children do not have to choose between these programs and other holiday programs. CSIRO's Holiday Science Activities are just a piece of a child's holiday, but an important piece as they provide an educational program that promotes science interest.

The data from assessing the seven other Holiday Activities can be found in Appendix J. The observations of other science holiday programs were used as a comparison to CSIRO's Holiday Science Activities. The interviews with staff from seven other holiday programs we researched were used to determine aspects which made the Holiday Activities more appealing for both children and parents.

4.6.1 Science Holiday Program Comparison

A comparison was done with only science-based programs by evaluating each program's purpose, content, and delivery.

Table 5: Comparison of Holiday Science Activities

	Purpose (Derived from interviews with program directors)	**Content Quantity**	**Delivery**
Monash Science Centre	To give children an interactive program during the holidays to encourage continuous science learning.	One topic in one hour of instruction.	Half discussion, half activity. Rushed because of time limits.
Scienceworks/ Melbourne Museum	To spread science to children of all ages through a combination of exhibits, performances, and activities.	Multiple topics and varying length of time based on child's rate of viewing exhibits.	Workshops were scripted at Scienceworks and rushed. Discussion and activities were done at the same time. Melbourne Museum allows plenty of time to complete the activity and the volunteers were well trained to assist children.
CSIRO	To promote and continue science interest in a fun, hands-on learning environment.	Three topics in six hours of instruction.	More activity than discussion. Partial depth is reached for each topic. Each topic has a short introduction, activities usually in stations, and then a brief conclusion.

Overall, Monash Science Centre's holiday programs effectively met their goal, but the short length caused the program to be rushed and therefore did not reach any depth. Also, having only one presenter stalled the tempo of the programs. Scienceworks and Melbourne Museum have many resources for their programs, but they do not always use them effectively and tend to focus more on the exhibits. The workshops at Scienceworks were short and rushed causing many children to become confused. CSIRO's Holiday Science Activities offer the only full day science program that we could assess. They offer plenty of time for hands-on activities while still providing adequate explanation.

Questacon, a science centre based in Canberra, no longer has holiday programs because they cost too much for the organisation. Instead, they spread science by displaying exclusive exhibits during the holidays and through travelling outreach programs. This works better for Questacon because the holiday programs require staff and space, taking away from the effectiveness of the science centre. The exhibits and travelling programs target more people with their given resources. The ultimate dream of Questacon is for Australia as a

nation to be associated with science. To accomplish this, they believe people do not need to know specific facts, but just need to develop an appreciation for science.

4.6.2 Positive Holiday Program Aspects

Other holiday programs were not directly compared to CSIRO's Holiday Science Activities because of the varying goals and content. Therefore we summarized a list of program aspects that benefited either the children or the parents. These aspects were observed in multiple programs or mentioned by directors as a positive aspect of their program. In Section 4.7, the following aspects will be matched to CSIRO's current programs to determine the positive aspects.

- **Hands-on activities:** Children enjoyed programs where they could interact with activities or displays. Also, they were excited to start hands-on activities and were engaged while doing them.
- **Constructing an item to take home:** Making an item is a hands-on activity and it is a symbol of their experience at the program. This item can also serve as a continuation of their interest in the topic of the program. However, the item must be attractive and durable so that it may be used beyond the day of construction. An explanation on how to use the item should also be provided so it can properly work after the program.
- **Enough staff and/or volunteers:** Knowledgeable staff is always beneficial to a program. Staff can improve each child's experience by providing smaller group or one-on-one instruction and by personally exciting a child's interest. Trained volunteers can be a good addition to staff to add extra help and instruction when needed.
- **Inexpensive price for the experience:** Because all of the programs researched last only one day or less, the prices for these programs must be reflective of the experience. Parents want to know they are paying for quality, especially when the price is often more than day-care. An inexpensive price also allows lower income families to book into the programs.
- **Age separation:** Children generally feel more comfortable when they are around children of their own age. Age ranges spanning more than a few years can be intimidating for younger children. For older children it can create an experience less challenging than necessary. Smaller age ranges allow the instructors to tailor presentations to the specific age group.

- **Age appropriate content:** The content of the program must be age appropriate. Content that is too difficult will make children confused even with explanation. Content that is too easy will make children uninterested and bored. The program must challenge the children while still being coherent.
- **Breaks between activities:** In a longer day program, breaks are necessary as they allow children to have a snack or exercise. Breaks let children relax from the program so then they can refocus for the next activity. In addition, breaks allow staff members to reorganize and plan for the next activity.
- **Proper mix of variety and depth:** A program should have a variety of topics to make the program continually exciting and hold the attention of the children. However, depth of the topics is just as important to fuel the children that are knowledgeable and interested in the topic.
- **Facilities:** A program must have the proper facilities to house its activities. This includes an area that is large enough so that all activities can be performed. The space must also be safe for children. A part of having suitable facilities includes knowing how to utilize all the space that is available. Equipment should also be age appropriate and readily available.
- **Sufficient time for activities:** Enough time must be devoted for each activity so they may be fully completed. A rushed activity prevents children from fully understanding the topic. Too much time causes boredom in children because they do not know what to do once they complete the activity.
- **Wow factor**: Children love the exciting moments of a program when something unexpected happens. A thrilling demonstration or activity can be the deciding factor between a child having a good day and an amazing experience. This also stimulates interest in children.

Holiday activities' duration and start time varied with each organisation. Both of these aspects are important, but there is no ideal duration or start time for all programs. We found programs as short as one hour and as long as the whole day that booked out. In the pre-program survey, parents ranked duration and start time lower than children's interests, content, and reputation of the provider. In our post-program telephone interviews, we asked parents for an ideal duration and start time. The result was every parent had a different opinion for both aspects. Time of day varied based on the parents' work schedules. Some parents wanted a full day program so they could drop off their child before work and pick

them up after while other parents wanted a shorter program because a full day was too long for their child. Therefore, these two aspects should be based on the content presented and the type of program the organisation wants to provide.

4.7 Successfulness of CSIRO's Holiday Science Activities

This chapter has detailed many of the results we found when assessing CSIRO's Holiday Science Activities. We used the positive aspects of other holiday programs and compared these to the current characteristics of CSIRO's Holiday Science Activities.

Table 6: Comparison of Program Aspects to CSIRO's Characteristics

	Characteristic of CSIRO	Description
Positive Aspects		
Hands-on activities	Yes	Children participate in hands-on activities for most of the day
Make and take	Yes	Children take home three items
Plenty of Staff	Yes	Four staff for 25 children
Inexpensive for experience	Partial	Most parents do not complain about price, but some commented that that items they take home do not reflect the price
Age separation	Partial	Children are separated into three age groups, but the oldest group spreads four years from 10 to 13
Age appropriate content	Partial	The content was almost never too difficult, but some parents said that it was too easy for their child
Breaks between activities	Yes	Three breaks throughout the day for lunch and tea
Mix of variety and depth	Yes	Three topics each going into some depth
Sufficient time for activities	Yes	Enough time was allocated for each activity, sometimes too much time was allowed for some stations
Wow factor	Yes	Great demonstrations that capture the attention of the children

CSIRO's Science Holiday Activities display many positive aspects and partially show a few aspects that indicate room for improvement. This shows that the Holiday Activities are overall positive, but the success of the programs is also based on the satisfaction of the

children and parents.

As previously stated, almost all children expressed they were having fun during the programs. Also, observations were mostly positive toward child enjoyment and most parents claimed after the program that their child was content with the programs. Many of these children have returned from previous holiday programs and some specifically verbalized to their parents that they wanted to go back. Through this, we can conclude that children are thoroughly satisfied with the programs and that the programs are successful for children.

The post-program telephone interviews revealed that a large percentage of the parents were satisfied with the programs. Overall, parents believe that the programs had a positive impact on their child. They view the programs as educational, and some even saw a science interest increase in their child afterwards. Some parents did make recommendations for the programs, but for the most part these were small details that did not address the whole program. Through these results, we can infer that the programs are also meeting the needs of parents.

Through CSIRO staff interviews, it was determined that all four staff members believed the programs were successful. They view the programs as successful because they see children and parents pleased with the Holiday Activities. They consider the success of the programs is manifested by the programs booking out every year, and the high return rate of the children. Even though CSIRO is a not-for-profit organisation, the programs do create revenue which lowers costs on school programs. This benefits schools across the state by funding quality science programs.

Children, parents, and CSIRO staff members all view CSIRO's Holiday Science Activities as being beneficial. Therefore, we can conclude that the programs are successful because they are satisfying all active parties. This does not mean that the programs are perfect. There are some improvements that can be made to the program which will be discussed in the recommendations portion of the next chapter.

Chapter 5 Conclusion & Recommendations

The goal of this project was to acquire sufficient information to effectively evaluate CSIRO's Holiday Activities based on parents' responses to our pre-program survey and post-program phone interviews. To further support our evaluation, three CSIRO staff members were interviewed and seven other holiday programs were studied. This section will summarize the conclusions that were formulated in regard to our observations and findings. Below is a list of topics discussed in our conclusion:

- A summary of CSIRO's Holiday Science Activities' target audience
- Main reasons why parents chose CSIRO's Holiday Activities
- Impact and importance of CSIRO's Holiday Activities
- A continuation and enhancement of children's science interest

Additionally we will suggest the following recommendations:

- Audience expansion and ways to improve marketing techniques
- Continuation and improvement of science impact
- Improvements for program structure
- Enhanced make & take items
- Future research suggestions

5.1 Parental Motivations

A portion of the success of the programs is determined by the factors that influence parents to choose CSIRO. An underlying base for children's enrolment to the programs was their parents' general science interest. Through research and comparison we were able to classify the parents attending CSIRO based on their science interest. Additionally, we determined the top three factors affecting parents' decisions to choose CSIRO's Holiday Science Activities.

5.1.1 Characteristics of Parents

The data obtained from the questionnaires showed that the programs are successfully targeting parents with a science background. The majority of parents display a general interest in science, more so than the Victorian community. The parents also are active in searching for science information; 46% of parents were segmented into the most active, science-interested group compared to the 26% of Victorians that fall into the category. CSIRO's audience is overall well-educated in general and science education. CSIRO is

mostly appealing to children from families who are already interested in science, even though one of their goals is to attract a diverse range of families.

5.1.2 Why Parents Chose CSIRO's Holiday Activities

Parents rated a total of nine factors during the pre-program survey that influenced why they booked their children into the Holiday Activities. We determined that the main reasons why parents chose CSIRO's Holiday Activities were because of the science content, child's interest, and CSIRO's education reputation. Because science content was rated so highly, we can conclude that either the child or the parent wanted to attend the program for science content. This could be due to the child's current interest, or because the parent wants their child to become more involved with science. The child's interest factor was also rated very high. This means that the children are excited about science and, therefore, want to attend the programs. The reputation of CSIRO was the third highest factor. From this, we can conclude that parent's value CSIRO as an organisation especially for its science education.

These factors suggest the reasons for participation in the programs were a combination between the child's desire to be immersed in a science environment, and the parents attempt to stimulate that interest.

5.1.3 Recommendations

Through the extended analysis of our findings, we were able to devise the following recommendations:

- **Audience Expansion**: If CSIRO wants to expand their audience to include non-science-interested parents, they should consider changing marketing techniques. We have recommended a few ideas which hopefully will target an audience whose interests are not focused on science and technology.
    - Explore search engine optimization of the Holiday Activities website. Currently when "holiday programs Melbourne" is searched in Google's search engine, CSIRO's Holiday Activities appears on the second page. If their website can be optimized to appear on the first page, it may receive more views from a general audience looking for holiday programs.
    - Report activity dates to online websites such as Victoria online which post holiday programs of all types for free. This will reach a broad audience where parents from all around Melbourne could look for holiday activity ideas.

    - Develop a program or partnership that can discount the price of the activities for families that cannot pay the full price. This will allow more children to attend the programs without worrying about cost.
    - Contact community centres near the program sites and tell them about the Holiday Activities. If possible, see if the community centres will tell families looking for a holiday program about the activities.
    - Advertise for the Holiday Activities through the school programs. If the school programs sparked a new interest in a child, then the child might ask their parents to attend the Holiday Activities.
- **New Site Location**: One way to attract new families would be to open up a new site which does not fall within the ten kilometre radius of other sites. If CSIRO wants to expand to a new location, the organisation should first determine if this is reasonable with the number of staff and possible increased transportation expenses that might be required. Based on initial research we determined the following five communities that could be possible new sites. These recommendations reflect preliminary findings only and additional research should be conducted to determine the potential of these sites.
    - Dandenong
    - Manningham
    - Broadmeadows
    - Melton
    - Western Wyndham

5.2 Impact and Importance of Holiday Science Activities

A significant portion of this project concentrated on evaluating the post-program impact on the children who attended. Impact was defined as increasing a child's interest or excitement towards science. The following section looks at CSIRO's ability to enhance a child's interest in science.

5.2.1 Continuation and Enhancement of Children's Science Interest

For the most part, the programs excite a child's short-term interest in science, yet the extent of impact on their long-term interest is inconclusive. From the parents we interviewed, 97% claimed that their child enjoyed the programs. Thus, it can be noted that CSIRO is satisfying the enjoyment needs of almost all the children involved in their Holiday Activities. Our data show that the children expressed their desire to return to the programs. However, responses from both the parents and CSIRO's staff interviews do not accurately demonstrate

the long-term impact the programs have on the children's interest in science. In order to make an accurate conclusion about the long-term impact, children who attended the programs would have to be interviewed a few weeks after completion of the Holiday Activities. Despite this, CSIRO is triggering children's desire to return to the programs.

5.2.2 Importance of Holiday Activities

The Holiday Activities are important because they contribute to the community. CSIRO offers one of the few science-based holiday programs in the Melbourne area. The majority of the parents and children enjoy and are satisfied with the programs, which encourages them to attend again. After repeated attendance to the programs, parents expect these local programs to be available during the upcoming holidays. Because CSIRO wants to maintain a child's interest in science, they should continue to provide these programs. Furthermore, the programs are economically beneficial for CSIRO, as the income generated by these programs is used to partially offset the cost of the school programs. This impacts more children as the school programs are more affordable to teachers throughout all of the Melbourne area. Without this economic boost, there may be some schools that could not afford CSIRO school programs. This economic benefit allows CSIRO to influence science education in schools as a result of the Holiday Activities.

5.2.3 Recommendations

After noting the impact the science content had on the children, we recommend the following to improve the continuation and enhancement of science interest:

- **Redistribute Age Ranges:** The Intermediate group spans four years from 10-13 years-of-age, a larger range than any other group. The programs did not satisfy all these ages because they could not target all children. To enhance the science interest in children, the Intermediate age range must be smaller.
- **Challenge Intermediates:** The science content that CSIRO provides must target children based on the age range to further enhance their interest in science. Many parents suggested that the content was too easy for Intermediates. The programs must be challenging, especially for this age group, so the children do not become bored. If the content is too easy, then children will lose interest in the activities.
- **Make & Take Items**: Parents considered the items that children made and brought home with them too simple stating that they could have easily been constructed in

their home. The following recommendations to the take home items could enhance the impact of the programs.

- **Higher Quality Items**: To improve parents' perceptions of these devices, CSIRO should consider making items that are not paper-based. Instead of having children construct three items, children could construct a one or two items of higher quality.
- **Handout:** CSIRO should provide children with a handout indicating the history, use, and function of the items. With this, children can better communicate the knowledge acquired about the item to their friends and family. This sheet could also provide additional activities or experiments that could be completed at home.
- **Online:** An alternative to a handout would be to post these activities or experiments based on the Holiday Activities online. This would allow parents and children to do more science in their home continuing the science excitement and interest of the children.

5.3 Recommendations for Program Operations

We identified several potential improvements to CSIRO's Holiday Activity operations.

- **Stations**: The stations should be structured to allow all children to participate continually in the hands-on activities. More importantly, not all of the activities at each station required the same amount of completion time. We recommend that stations are designed to have an equal completion time so that the programs retain the children's attention effectively. In conjunction with this, we recommend that there must be enough equipment per station, so that each child is able to complete the activity individually.
- **Activity Length**: The Holiday Activities vary are typically structured by presenting an introduction first, followed by an activity, and a final demonstration. The activities should loosely follow this structure, but there should be some more flexibility to allow for adjustments. This would allow experiments or activities that take longer than the allocated hour and a half to be conducted.
- **Topics Covered**: CSIRO's Holiday Activities cover a variety of topics, which is a factor that attracts children and parents. Regardless, the same topics are offered

throughout the entire holiday. CSIRO should consider offering more programs at a specific site. That way, children can attend more than once per holiday.

- **Program Duration**: CSIRO should consider conducting a Holiday Program that runs for more than a day. Parents expressed interest in a science program that lasted between two to three days, thus the experiments children perform could be more intricate. Although this requires more preparation, but it could be a very successful program for children that are interested in science.

5.4 Future Research Suggestions

For future recommendations and improvements that contribute to the successfulness of the Holiday Science Activities, the following aspects require further research:

- **Reasons for Decrease in Attendance to Intermediate Levels**: From the information gathered through our phone interviews and CSIRO staff interviews, we noted that there are fewer children who attend Intermediate level programs than children who attend Junior level programs. Also, we noticed that the only session that did not book out was an Intermediate level program. This makes us wonder if there is a lower retention rate from the Junior level to the Intermediate level. Research could look into the reasons why fewer Intermediates return when there are many Juniors that do. We think this could be a result of the programs not being challenging enough for Intermediates, but future research could test this hypothesis.
- **Site Locations**: Results from the pre-program survey revealed that most parents travel between 0-10 km to attend the Holiday Activities. It is recommended that the organisation does not move their sites so these parents can continue enrolling their children in the programs close to their homes. Future research could look into possibilities for additional sites, both within metropolitan Melbourne and beyond, to expand the audience.
- **Identify Connection Between School Programs and Holiday Activities**: Determine any possible connection between the content offered during school programs and content of the Holiday Activities. The Holiday Activities could potentially be linked with the school programs thus continuing science interest from one CSIRO event to the next.

These research suggestions can be used to find new information or build on our results.

We assessed the Holiday Activities to determine parental motivation for booking their children and the impact of these programs. These programs are important to fuelling children's science interest, to providing an educational program for children, and to support the funding of CSIRO's school programs. CSIRO can use this assessment to improve their offering of hands-on science Holiday Activities as they continue to meet the needs of parents and children for high quality science-based programs.

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Appendix A: Other Holiday Program Descriptions

Monash Science Centre: The Monash Science Centre is a part of Monash University and provides science-based holiday programs for two weeks during the holidays. These programs run only for one hour for the younger groups and two hours for the older group. They are designed to be hands-on and interactive for the children to further their interest in science. One presenter leads a group of up to 20 children. The programs are cheap compared to others, but they are short. However, many children attend multiple programs during the two weeks because the content changes every day.

Scienceworks: The holiday programs at Scienceworks museum are a combination of presentations, workshops, and exhibits. The hands-on, staffed workshop only lasts 30 minutes, but it is designed to be supplemented with exhibits in the museum. The workshop is led by one presenter and assisted by six volunteers for 25 children. A do-it-yourself activity is also available for children to do all day on their own. Therefore, the holiday programs can last as long as the child and parent stay. Children are free with adult admission which is very low compared to other holiday programs. There are small entry fees for shows such as the planetarium and lightning room.

Melbourne Museum: Another museum of Victoria and very similar to Scienceworks, Melbourne Museum holiday programs are also designed to be a combination of activities, workshops, and exhibits. Admission prices are the same as Scienceworks and the holiday program length also varies depending on how long the child and parent stay. There is one activity that child can complete at any time during the day.

Children of Higher Intellectual Potential (CHIP): CHIP is for children who are intelligent, but feel separated from the rest of their classmates. At CHIP holiday programs, students spend a whole day participating in english, mathematics, thinking, history, and science activities. Children often attend more than one session during the holidays, but the programs only last one week. The primary objective is social and emotional development while learning is secondary. The program is very expensive, but they also last all day and are well staffed.

Heide Museum of Modern Art: Holiday programs last up to two and a half hours at this museum. The programs are always art based. One presenter leads up to 25 children, but volunteers assist the programs. The activity is designed to be in conjunction with the exhibits. The price is reasonable for over two hours of activities.

Melbourne Zoo: Melbourne Zoo provides a six-hour program designed for children who want to learn more about wild animals and zoo keeping. Children get a behind the scenes experience in the zoo. The holiday programs are designed for a primary school age range and run for two weeks. Children only attend for one day and the price is reasonable for a long day

of activities.

Questacon: A national science provider based in Canberra, Questacon provides holiday exhibits for Canberra and travels to other cities in Southeast Australia. Questacon's traveling programs vary in length and cost, but are fairly cheap. The programs are always science based and often provide traveling exhibits for Scienceworks. Questacon does not come to Melbourne often, but their program was examined for its science content.

Appendix B: Pre-program Survey

CSIRO Holiday Program Survey

CSIRO in conjunction with WPI is conducting this survey to evaluate the CSIRO Holiday Programs. This survey is meant for assessment purposes only. Participation is voluntary and you may stop at any time. You do not need to answer all the questions. All names and phone numbers will be kept confidential and will never be identified with your answers. Your responses are greatly appreciated.

1. What is your relationship to the child enrolled in this program?

_____

2. What is your highest level of education? (circle one)

a) Year 10
b) Year 12
c) Undergraduate
d) Postgraduate

2. What is your highest level of science education? (circle one)

a) Year 10
b) Year 12
c) Undergraduate
d) Postgraduate

3. Which of the following best describes the sector in which you work? (circle one)

a) Management/ Administration
b) Government
c) Environment/ Conservation
d) Building/Construction
e) Agriculture
f) Science/Engineering/Technology
g) Tradesperson
h) Finance/Accounting
i) Communications
j) Education
k) Health
l) Sales/Marketing
m) Art/Design
n) Home duties
o) Hospitality
p) Other (Specify): _____

4. How far away from this CSIRO Holiday Science Program venue do you live? (circle one)

a) 0-10 km
b) 11-20 km
c) 21-30 km
d) 31-40 km
e) >40 km

5. How aware are you of new science & technology concepts or breakthroughs? (circle one)

a) Very aware
b) Partially aware
c) Not aware at all
d) I do not care

6. How frequently do you actively search for information about science & technology (such as medical breakthroughs, facts on nanotechnology, etc.)? (circle one)

a) Often
b) Sometimes
c) Rarely
d) Never

7. When you have looked for information about science & technology in the past, how frequently have you been able to find what you were looking for? (circle one)

a) Often
b) Sometimes
c) Rarely
d) Never

8. When you have found information about science & technology, how much do you understand?

a) All
b) Majority
c) Some
d) Little
e) Not Applicable

9. What other science-based activities or programs have your children attended during holidays?

10. What non-science-based activities or programs have your children attended during holidays?

Date: _____ Site: _____

Please continue on reverse side →

11. Please rate the factors that contributed to your decision to book your CSIRO Holiday Activities for your children.
1-no influence **2**-little influence **3**-some influence **4**-moderate influence **5**-significant influence

Location	1	2	3	4	5
Price	1	2	3	4	5
CSIRO Education's reputation	1	2	3	4	5
Science/Mathematics content	1	2	3	4	5
Safety	1	2	3	4	5
Child's current interests	1	2	3	4	5
Child's friend's interests	1	2	3	4	5
Time of Day	1	2	3	4	5
Duration	1	2	3	4	5

12. Please rate the factors that contributed to your decision to book OTHER holiday activities for your children (if applicable).
1-no influence **2**-little influence **3**-some influence **4**-moderate influence **5**-significant influence

Location	1	2	3	4	5
Price	1	2	3	4	5
Reputation of the provider	1	2	3	4	5
Content of program	1	2	3	4	5
Safety	1	2	3	4	5
Child's current interests	1	2	3	4	5
Child's friend's interests	1	2	3	4	5
Time of Day	1	2	3	4	5
Duration	1	2	3	4	5

13. Has your child previously attended the CSIRO Holiday Programs? YES NO
If so, how many times? _____

14. Is your child a Double Helix Science Club member? (circle one) YES NO

15. Has your child (or your child's school) been involved in any of the following CSIRO programs? (circle all that apply)
CREST Carbon Kids Scientists in Schools Traveling Science Programs Unsure

16. Does your child regularly watch 'SCOPE', a science show for children on Network 10? (circle one)
YES NO Unsure

17. How did you hear about CSIRO Holiday Science Activities? (circle all that apply)

- Previously Attended
- CSIRO Mail-out
- From child's school
- Local newspaper
- Double Helix Science Club
- Advertisement in *Melbourne's Child*
- CSIRO website
- From child's friend
- From your friend
- CSIRO email
- Online search engine
- Other (Specify): _____

We would like to conduct a post-program telephone interview to supplement this survey. This would last no more than 10 minutes, and will help us to provide a valuable assessment of the program. If you agree to be contacted, please provide the following information.

Name: _____

Telephone number: _____

Best time to contact you: _____

All information will be kept confidential and your name will never appear with your answers. Your feedback is greatly appreciated. Thank you for your time.

Appendix C: Observation Chart

Name: **Date:**
Number of Kids: **Level:**
Location: **Activity:**

	Comments	Number
Asked a Question		
Tried Answering Question		
Eye Contact		
Discussion		
Enjoyment		
Participation		
Boredom		
Frustration		
Distracted		
Misusing Equipment		
Following Directions		
Completion of Activity		
Additional Comments		

Favorite Subject
Science_____
Math _____
Art _____
Sport _____
Reading _____
Computer _____

Career Aspirations

Enjoying Program
Yes _____
No _____

Previsously Attended?

Appendix D: Parent's Interview Questions

1. What attracted you/your child to the Programs?
2. Has your child developed an increase in science interest since attending the CSIRO Holiday Programs?
3. Has your child talked to you or any relatives or friends about his/her experience at the CSIRO Holiday Science Programs? What have they told you? Immediately after the program? More recently?
4. Were you pleased with how the CSIRO Holiday Science Programs were organized? Why or why not?
5. Do you mind the commute to CSIRO's Holiday Programs? If the site was moved to a farther away location, would you still be willing to take your child to the programs? Why/Why not?
6. Are there any other holiday programs in your area?
7. What mode of transportation do you use to get to CSIRO Holiday Programs?
8. Where do you find your information about science? What triggers you to look? What was the last thing you researched?
9. What would be your ideal Holiday Program?
    a. Duration
    b. Time
    c. Content
    d. Cost
10. Did your child enjoy the Holiday Program? What did they like about it?
11. What is your impression of the gadget your child made?
12. What was the dominating factor that convinced you to book your child in the CSIRO Holiday Programs?
13. Would you recommend the CSIRO Holiday Science Programs to a friend? Why or why not?
14. What improvements do you think could be made to the CSIRO Holiday Science Programs?

Conditional Questions

1. (If work sector is not in a science related field) What sector does your spouse work in?

2. (If heard about the Holiday Programs from word of mouth) What kinds of things have you heard about CSIRO's Holiday Programs from other people? Do you agree?
3. (If child has attended the Holiday Programs before) Why did you bring your child back to the Holiday Programs?
4. (If child has never been to Holiday Programs before) Do you think you will bring your child back to the Holiday Programs? Why/Why not?
5. (If the child has attended another science holiday program) What did you think of (blank)'s holiday programs? What did you like/dislike about their program? How do CSIRO's Holiday programs compare to (blank)'s programs?
6. (Only if the child has returned to the programs) Did your child ask to go back to CSIRO's Holiday Programs, or did you ask your child if they wanted to go back, or did you tell them to go back?
7. (If they live farther away) Would you be willing to pay more for the program if a new site opened up closer to your home ($120)?
8. (If work in Education [or another interesting work sector]) What is it your job title?

Appendix E: Outline for Semi-structured Interviews with Directors of Other Holiday Programs

Learn about program and content	•How long do the programs last? Do they run every day? •How many children participate each day?How many staff members are there per child? •What age range is the program designed for? •What are some topics that are covered by the program?
Determine goals and objectives of the program	•Do the children enjoy the programs? •What is the overall goal of the program? •What do you hope children learn or achieve from the program? •Do you think you are meeting your goals? How do you know/not know?
Determine program strengths and weaknesses	•What makes your program unique from other holiday activities? •What are some other strengths of your program? •If you could improve the program, what would you do? Why? •Can the children attend miltiple sessions during the holiday? Do they? •What is the return rate fro the programs? Why do you think they return?
Determine parent feedback, if any	•What is some feedback that you have received? •Do you think you are satisfying the needs of children and parents with your program?
Determine Program Target Audience and Location	•Where are the programs held? Where are they focused? •Do the programs usually bookout? Hoe quickly? Do you have a waitlist? •What is the target audience? How far do they travel? •How do you advertive the program?

Appendix F: CSIRO's Staff Interview Questions

CSIRO staff member:	
Interviewer:	
Scribe:	
Date:	

	Questions:	Answers
1	How long have you worked at CSIRO?	
2	Have you worked the Holiday Programs since you started?	
3	What do you like about the CSIRO Holiday Programs in terms of structure?	
	a. Length of day?	
	b. Three programs per day?	
	c. Item?	
	d. Placement of lunch and tea times?	
	e. Number of children?	
	f. Number of staff?	
4	Difference between Holiday Programs and School Programs	
5	What do you dislike about the Holiday Programs in terms of the same things?	
6	What do you think about the topics covered?	
7	What improvements can be made to the programs**?**	
	a. (If applicable) how would you do this?	
8	Why do you think parents bring their children to the Holiday Programs?	
	a. Would you consider the Holiday Programs successful for CSIRO?	
	b. Do you think parents consider the programs successful?	
	b. Compared to the school programs?	
	c. Why?	
9	What do you think of the idea of a multi-day program?	
10	Do you think children understand most of the information presented?	
11	How would you define impact?	
12	Do you think children are more interested in science after completing the Holiday Programs?	
13	Has a parent ever come up to you to negatively comment on the programs?	
14	Have you ever worked science holiday programs hosted by other organisations?	
	a. Where?	
	b. What did you like and dislike about their holiday programs?	
	c. How do you think CSIRO's Holiday Programs compare?	

Appendix G: Analysis of Pre-Program Survey Responses

Table 1: Number of Surveys per Program Site

Site	Number of Surveys	Percent of Responses (%)
Highett	30	24.19
Glen Waverly	29	23.39
Yarraville	19	15.32
Kew	46	37.10
Total	124	100

Table 2: Number of Surveys per Date of Program

Date of Program	Number of Surveys	Percent of Responses (%)
13/1/11	20	16.13
14/1/11	25	20.16
17/1/11	23	18.55
18/1/11	16	12.90
19/1/11	27	21.77
20/1/11	13	10.48
Total	**124**	**100**

Table 3: Number of Surveys per Age Group

Age Group	Number of Surveys	Percent of Responses (%)
Little Learners	28	22.58
Junior	83	66.94
Intermediate	13	10.48
Total	**124**	**100**

Table 4: Relationship to Child

Relationship to Child	Number of Responses	Percent of Responses (%)
Mother	80	64.52
Father	25	20.16
Parent	19	15.32
Total	**124**	**100**

Table 5: Highest Level of Education

Level of Education	Number of Responses	Percent of Responses (%)
Year 10	2	1.67
Year 12	12	10.00
Undergraduate	28	23.33
Postgraduate	78	65.00
Total	**120**	**100**

Table 6: Highest Level of Science Education

Level of Science Education	Number of Responses	Percent of Responses (%)
Year 10	26	21.49
Year 12	35	28.93
Undergraduate	25	20.66
Postgraduate	35	28.93
Total	**121**	**100**

Table 7: Work Sector

Work Sector	Number of Responses	Percent of Responses (%)
Student	1	0.90
Communications	2	1.80
Sales/Marketing	3	2.70
Environment/Conservation	4	3.60
Building/Construction	4	3.60
Art/Design	5	4.50
Government	6	5.41
Finance/Accounting	8	7.21
Management	13	11.71
Science/Engineering/Technology	14	12.61
Home Duties	15	13.51
Health	17	15.32
Education	19	17.12
Total	**111**	**100**

Table 8: Distance from Holiday Activities

Distance	Number of Responses	Percent of Responses (%)
0-10 km	77	63.11
11-20 km	27	22.13
21-30 km	11	9.02
31-40 km	2	1.64
40+ km	5	4.10
Total	**122**	**100**

Table 9: Science and Technology Awareness

Degree of Awareness	Number of Responses	Percent of Responses (%)
Very Aware	21	17.07
Partially Aware	89	72.36
Not Aware at All	13	10.57
I Do Not Care	0	0
Total	**123**	**100**

Table 10: Frequency of Actively Searching for Science

Frequency	Number of Responses	Percent of Responses (%)
Often	28	22.58
Sometimes	54	43.55
Rarely	35	28.23
Never	7	5.65
Total	**124**	**100**

Table 11: Frequency of Finding Science Information

Frequency	Number of Responses	Percent of Responses (%)
Often	57	47.11
Sometimes	53	43.80
Rarely	8	6.61
Never	3	2.48
Total	**121**	**100**

Table 12: Understanding Information about Science

Level of Understanding	Number of Responses	Percent of Responses (%)
All	5	4.13
Majority	66	54.55
Some	43	35.54
Little	7	5.79
Total	**121**	**100**

Table 13: Ratings of Parental Motivation Factors for CSIRO and Other Holiday Activities

		CSIRO		Other	
		Number of Responses	Percent of Responses (%)	Number of Responses	Percent of Responses (%)
Factor	**Rating**				
Location	1	12	10.91	5	5.62
	2	14	12.73	9	10.11
	3	33	30.00	21	23.60
	4	24	21.83	22	24.72
	5	27	24.55	32	35.96
	Total	**110**	**100**	**89**	**100**
	Mean	**3.36**		**3.75**	
Price	**Rating**				
	1	14	12.96	5	5.75
	2	36	33.33	12	13.79
	3	33	30.56	30	34.48
	4	14	12.96	17	19.54
	5	11	10.19	23	26.44
	Total	**108**	**100**	**87**	**100**
	Mean	**2.74**		**3.47**	
Reputation	**Ratings**				
	1	1	0.90	4	4.49
	2	4	3.60	5	5.62
	3	25	22.52	11	12.36
	4	30	27.03	34	38.20
	5	51	45.95	35	49.33
	Total	**111**	**100**	**89**	**100**
	Mean	**4.14**		**4.02**	
Content	**Ratings**				
	1	1	0.90	2	2.27
	2	4	3.60	3	3.41
	3	15	13.51	7	7.95

	4	35	31.53	27	30.68
	5	56	50.45	49	55.58
	Total	**111**	**100**	**88**	**100**
	Mean	**4.27**		**4.34**	
Safety	**Ratings**				
	1	11	9.91	5	5.81
	2	10	9.01	8	9.30
	3	31	27.93	17	19.77
	4	27	24.32	27	31.40
	5	32	28.83	29	33.72
	Total	**111**	**100**	**86**	**100**
	Mean	**3.53**		**3.78**	
Child's Interests	**Ratings**				
	1	1	0.92	3	3.37
	2	4	3.67	7	7.87
	3	17	15.60	11	12.36
	4	33	30.28	27	30.34
	5	54	49.54	41	46.07
	Total	**109**	**100**	**89**	**100**
	Mean	**4.24**		**4.08**	
Child's Friend's Interests	**Ratings**				
	1	56	51.38	33	38.37
	2	26	23.85	23	26.74
	3	11	10.09	17	19.77
	4	9	8.26	9	10.47
	5	7	6.42	4	4.65
	Total	**109**	**100**	**86**	**100**
	Mean	**1.94**		**2.16**	
Time of Day	**Ratings**				
	1	15	13.76	8	8.99
	2	30	27.52	14	15.73
	3	30	27.52	26	29.21
	4	26	23.85	22	24.72
	5	8	7.34	19	21.35
	Total	**109**	**100**	**89**	**100**
	Mean	**2.83**		**3.34**	
Duration	**Ratings**				
	1	16	14.41	10	11.36
	2	27	24.32	11	12.50
	3	34	30.63	23	26.14
	4	23	20.72	24	27.27
	5	11	9.91	20	22.73
	Total	**111**	**100**	**98**	**100**
	Mean	**2.87**		**3.38**	

Table 14: Average Rankings of Parental Motivation Factors

CSIRO		Other	
Factor	**Ranking**	**Factor**	**Ranking**
Content	4.27	Content	4.34
Child's Interests	4.24	Child's Interests	4.08
Reputation	4.14	Reputation	4.02
Safety	3.53	Safety	3.78
Location	3.36	Location	3.75
Duration	2.87	Duration	3.38
Time of Day	2.83	Time of Day	3.34
Price	2.74	Price	3.47
Child's Friend's Interests	1.94	Child's Friend's Interests	2.16

Table 15: Child's Previous Attendance

Previous Attendance	Number of Responses	Percent of Responses (%)
Yes	61	55.45
No	49	44.55
Total	**110**	**100**

Table 16: Number of Times Child has Previously Attended

Number of Times	Number of Responses	Percent of Responses (%)
1	11	19.64
2	10	17.86
3	9	16.07
4+	26	46.43
Total	**56**	**100**

Table 17: Double Helix Membership

Membership	Number of Responses	Percent of Responses (%)
Yes	62	57.94
No	45	42.06
Total	**107**	**100**

Table 18: Viewing of SCOPE

Watch Scope	Number of Responses	Percent of Responses (%)
Yes	14	15.38
No	77	84.62
Total	**91**	**100**

Table 19: How Parents Heard about CSIRO's Holiday Science Activities

Medium	Number of Responses
Double Helix Science Club	38
Previously Attended	29
CSIRO Website	24
CSIRO Email	18
From Child's School	17
From Your Friend	14
From Child's Friend	12
CSIRO Mail-out	11
Online Search Engine	10
Advertisement in *Melbourne's Child*	8
Local Newspaper	6
CHIP	1

Table 20: How Parents of Children who had not Attended CSIRO's Holiday Science Activities Heard About Them

Medium	Number of Responses
Double Helix Science Club	5
Previously Attended	1
CSIRO Website	3
CSIRO Email	0
From Child's School	4
From Your Friend	6
From Child's Friend	6
CSIRO Mail-out	1
Online Search Engine	1
Advertisement in *Melbourne's Child*	1
Local Newspaper	0
CHIP	1

Appendix H: Data from Observation Charts

Table 1: Observed Boredom of Children

Boredom	Number of Observations	Percent of Responses (%)
Cannot Tell	9	12
No	45	62
Yes	19	26
Total	**73**	**100**

Table 2: Observed Frustration of Children

Frustration	Number of Observations	Percent of Observations (%)
None	38	61
Some Frustrated	21	34
Other	3	5
Total	**62**	**100**

Other: Couldn't complete activity in time (1), Understood after second explanation (1), Disability (1)

Table 3: Observed Distraction of Children

Distraction	Number of Observations	Percent of Observations (%)
None	16	21
Some Distracted	52	68
Other	8	11
Total	**76**	**100**

Other: Hyper after lunch/recess (2), Result of Boredom (5), Behavioural (1)

Table 4: Observed Misuse of Equipment by Children

Misuse of Equipment	Number of Observations	Percent of Observations (%)
None	40	63
Some Misuse	22	35
Other	1	2
Total	**63**	**100**

Other: Didn't know how to use equipment (1)

Table 5: Observed Amount Children Following Directions

Following Directions	Number of Observations	Percent of Observations (%)
Partial	11	16
Most	25	36
All	33	48
Total	**69**	**100**

Table 6: Observed Amount of Children Asking a Question

Asked Question	Questions Asked	Number of Observations	Percent of Observations (%)
Less than Half	---	8	12
Yes	For Help	28	42
	About Activity	28	42
	Off-topic	3	4
Total		**67**	**100**

Table 7: Observed Amount of Children Who Answered a Question

Answered a Question	Number of Observations	Percent of Observations (%)
Most	50	73
Few	12	17
Other	7	10
Total	**32**	**100**

Other: Same child answered multiple questions (2), Did not get called on (5)

Table 8: Observed Amount of Children Who Displayed Eye Contact

Eye Contact	Number of Observations	Percent of Observations (%)
Little	8	8
Distracted	17	17
Most	75	75
Total	**100**	**100**

Table 9: Observed Discussion Topics amongst Children During Activity

Discussion Topics	Number of Observations	Percent of Observations (%)
About Activity	48	60
Not About Activity	29	36
No Discussion	3	4
Total	**80**	**100**

Table 10: Number of Children Participating During Activity

Recommend	Number of Observations	Percent of Observations (%)
Cannot Tell	1	3
No	12	38
Yes	19	59
Total	**32**	**100**

Table 11: Children's Favourite Subjects in School

Subject	Number of Responses	Percent of Responses (%)
Science	91	26
Maths	45	13
Art	56	16
Sport	53	15
Reading	34	9
Computer	47	13
Other	30	8
Total	**356**	**100**

Table 12: Children's Enjoyment of Holiday Activities through Questions

Response	Number of Responses	Percent of Responses (%)
Yes	125	97
No	4	3
Total	129	100

Appendix I: Data from Post-Program Interviews

Table 1: Parent's Perception of Child's Enjoyment

Type of Enjoyment	Number of Responses	Percent of Responses (%)
Enjoyed Content	16	46
Enjoyed Everything	8	23
Enjoyed Social	5	14
Other	4	11
No Enjoyment	1	3
Neutral Enjoyment	1	3
Total	**35**	**100**

Table 2: Parents Recommendations of the Holiday Activities

Recommend	Reasons	Number of Responses	Percent of Responses (%)
Neutral	---	1	3
No	---	1	6
Yes	Child Enjoyed the Program	7	22
	Already Recommended	7	22
	Unique	5	16
	Get Children Involved in Science	6	19
	Great Program	4	12
	Other	3	9
Total		**35**	**100**

Table 3: Recommended Improvements for the Programs

Type of Improvement	Reasons	Number of Responses	Percent of Responses (%)
No Change	---	11	31
Major Change	---	3	9
Minor Change	More of Something	9	43
	Time/Duration	4	19
	Other	8	38
Total			**100**

Table 4: Parents Perspectives of their Children Telling Friends and Relatives About the Holiday Activities

Told Anyone	Who/What	Number of Responses	Percent of Responses (%)
Not Sure	---	3	8
No	---	3	8
Yes	Relatives	9	31
	Explains/Uses Item	8	28
	Friends	3	10
	About Program	7	24
	Other	2	7
Total		**35**	**100**

Table 5: Parent's Perception of Child's Increase in Science as a Result of Attending CSIRO's Holiday Activities

Recommend	Number of Responses	Percent of Responses (%)
Cannot Tell	1	3
No	12	38
Yes	19	59
Total	**32**	**100**

Table 6: Number of Children that Plan to Return to the Programs

Return	Number of Responses	Percent of Responses (%)
No	3	9
Yes: Have Not Previously Attended	14	40
Yes: Previously Attended	18	51
Total	**35**	**100**

Appendix J: Notes on Other Holiday Programs

Monash Science Centre

Contact: Sandra Thong, Programs Officer
Interviewer: Lucas Smith-Horn
Scribe: Lucas Smith-Horn
Date: 25/1/2011

Holiday Programs

- **Program Operations**:
    - **Program Schedule**: "Twinkle, Twinkle, Little Star" Activity
        - **Stars and Sphere**
            - Sphere is 3D
            - Sphere is circle rotated at centre in three dimensions
            - **Activity**: Child makes rotating circle with rubber bands to simulate circle to sphere, child takes this home with them
                - Our Opinion: Very simple, could be better with more colour or something to improve the appeal of the sphere
        - **Sun is a star and planets move around the sun**
            - Solar Calendar
            - Lunar Calendar
            - Perpetual Calendar
            - **Activity**: Child determines birthday for next three days, writes this down and brings home paper
            - Our Opinion: Kind of a stretch from program topic, perpetual calendar is part of the rotation of the earth around the sun but I think this connection to the birthday calendar was lost on them. Boring to take home a piece of paper.
        - **Constellations**
            - Lots of constellations, people named them long ago
            - **Activity**: Child uses a grid and star shaped symbols and follows directions from teacher on where to put stars. The result is a constellations, little kids make the southern cross, middle kids make Orion
            - Our Opinion: The constellations didn't turn out great, somewhat hard to recognize them
            - Children are told to go outside that night and look at stars
        - **Craters**
            - Asteroids that hit a planet or moon make craters
            - Big bang theory?

        - **Little kids only Activity**: experiment with different sized and weighted balls to form craters in sand. Child measures the diameter of the crater and records it on a piece of paper. Take this paper home.
        - Our Opinion: Cool experiment, but contrasting variables with size and weight may have made understanding difficult. For example: ping pong ball and small marble. One is large and light, the other small and heavy. Once again, boring to take home a piece of paper.
    - **Collisions, asteroid collides with planets/moons**
        - **Activity**: Child rolls balls at "planet" and try to knock it out of orbit. See effect of larger mass and size on collision
        - Our Opinion: Silly that it represents the end of life on earth, but children liked it
    - **Little children only**: 8 planets, kids learn order of planets
        - Only 8 planets, Pluto is a dwarf planet, doesn't count
        - Our Opinion: Children were slightly confused by this, required some more explanation
        - Use sentence memorization to remember order
- **Observations of Programs**:
    - 14 kids, supposed to be 20 (Booked out, 6 didn't show)
    - 1 presenter
    - Good eye contact
    - All kids followed directions although sometimes they didn't know what to do exactly because of rushed directions
    - Everyone completed all activities
    - 1 classroom
    - See more info in pamphlet

Interview Responses

- **Maximum students/staff members**: 20 kids to 1 teacher, some parents stay for little group, sometimes another staff member will support but with no compensation
- **What is the overall goal of the holiday programs**: Need to have some program during the holidays, get kids in local area excited about science, contribute to education and life learning, bring in kids that don't have science in school, show the community that the science centre is there, promote school programs
- **What do you expect children to get out of the programs** Get to bring something home, have fun with hands-on science
- **Do your programs book out**: This year-yes, previous years not so much
- **Do you think you are meeting your goal**: Didn't ask question but the apparent response was yes
- **What makes MSC holiday programs unique**: Didn't ask this either but it was the local aspect and the small scale to the point where the staff knows most parents and students

- **What are some other strengths of MSC holiday programs**: Holiday programs promote school programs and it deters a day-care desire
- **Weaknesses**: Low budget, small room, only one classroom, need new curriculum every holiday
- **If you could improve anything with the programs what would you do**: More resources: space, equipment, 2 presenters, take children through actual science labs, team coordination on curriculum, larger staff
- **If you had these resources would you consider adding more time slots**: Yes, multiple sessions at once and maybe even three weeks of it
- **Do children often attend multiple sessions during the same holiday period:** Yes, at least 20% of youngest kids attend 3 (out of 4), less in the older groups
- **Return rate from one holiday to another**: Fairly high from holiday to holiday because children like it and family continuance
- **Why do children come to Monash's holiday programs**: Both parents and children want to go
- **Feedback from parents**: Usually positive, only negative has been the content is fairly simple

Summary:

The program Twinkle Twinkle was a math program designed for a primary school setting. This made it slightly more lecture like and less hands-on. According to staff, the holiday programs are usually more hands-on. The whole presentation seemed rushed with some lack of explanation resulting in a little confusion. The program was busy for 1 hour and did keep kids interested. Most kids seemed to enjoy the program, but some of the content needed to vary more from Prep-2 to 3-4. 5-8 programs are 2 hours long so it would have been interesting to observe those. The reason for short length is to deter parents from using the programs as a day-care but I wonder why they can't do a half-day program for some of the older kids.

The programs have great intentions: to provide science to the local area that enjoys science, does not always get science in school, or both. Teachers are afraid to teach science even if it is in the state or national curriculum. The program has potential to be on a large scale, but resources are at a minimum. They do not receive a lot of funding from Monash University. If resources (staff, classrooms, materials, curriculum, and marketing) were not an issue, the programs could be better. Overall, the programs are decent for the small scale and successfully serve the local community, but could see improvements if more resources were available.

CHIP Interview

Contact: Michelle, Program Coordinator
Interviewer: Peter Chunis
Date: 3/2/2011

How long do the programs last?
One week every holiday
Do they run every day? Weekends?
Mon-Fri
How many children participate in each program?
Not all children come every day
About 40-45
How many staff members are there per child (ratio)?
1:6 or sometimes 1:4 depending on the needs of the children
What is the age range of the programs?
Year 1, 2, 3, 4, 5, 6, 7, 8, 9-12
Like Minds, Learning to Learn, Progressing at an Appropriate Rate
How does the Year and Like Minds, Learning to Learn, and Progressing at an Appropriate Rate separate the children?
Prep-grade 6 not mixed. Above question only applies to regular programs during the school year. For the holidays, kids from prep to year 6 participate in the program and they are not put into separate groups.
What are some of the topics covered in the program? What programs took place this past holiday?
Math, English, Thinking, Chess, History, Usually science (robotics)
Where are the programs held? Where is the focus?
Hire Clifton Hill Primary schools
Do they usually book out? How quickly? Do you have a waitlist?
Science always. Others usually
What is the return rate for the programs? Why do you think they return?
Almost all (5 new ones). Providing a service that is needed for gifted children. Labeled anti-social. Have no one with whom to relate. Difficulty relating to an average group. School system focused on age, relating to older children. Don't have that option in classroom. Can start to view themselves as a "freak". Don't see difference as good, others disagree. Social and emotional. Makes them feel better about themselves. "I hope Dave is there."
What is the target audience? How far do they travel?
Children that fall under this category. Up to parents to make this decision. No testing. Tentative parents, meaning that the parents are hesitant about sending their kids to the programs. This is because they do not want to admit that their children are special.
How do you advertise the program?
Don't. Usually the parents find CHIP if their child need help.
What do you want the children to learn or achieve from the programs?
Want them to feel better about themselves in an emotional and social sense.
Do you think you are meeting your goals? Why/ Why not?
Yes. The children wouldn't be coming back if we weren't
Do the children enjoy the programs?
Wouldn't come back if they weren't. very small % do not return.
Can they attend multiple sessions during the holiday? Do they?
(most) Choose individual days. Some return for multiple.

What makes your program unique?

Social and emotional foundation. Education is a second objective.

What are the strengths of your program?

Social and emotional environment.

If you could improve the program, what would you do? Why?

Need more teachers who can deal with bright children. Great staff now. Lots of them came to programs when they were younger. Manage some centers. Difficult to find qualified staff. Not the expertise out there for this.

What is some of the feedback you have received from the parents?

Those who come back love it. Can't you move program from this week to another? Some don't like it, but they can't make everyone happy. Children enjoy going there.

Do you think you are satisfying the needs of the children and parents?

To a point. Still have huge needs in the normal school environment. Changed massively in the past 10-15 years. needs more expertise out there.

Scienceworks

Contact: Michelle Sanders, Programs Officer
Chair: Lucas Smith-Horn
Scribe: Brie Rawson
Date: 2/3/2011

Holiday Programs:

- **Program Operations:**
  - **Themes**: Usually always themed programs (around a travel exhibit or certain year eg. International Year of Chemistry)
  - **Facilities**: Some constraints to space, no set space, no fume hood and no wet floor thus limits the range of experiments/activities they can conduct
  - **Cost**: Museum is free to all children with adult entry $8
  - **Basic layout of holiday activities every year**:
    - Planetarium shows and lightning room during holidays- paid options
    - "Make and take" activity or experiment, takes place in the Experiment Zone for ages 6-12, this year Create a Colour- free
    - "Free-for-all" activity, all ages and everyone in family can participate, runs all day each season, this year How Small How Tall- free
    - Family/"big fun" performance, show in amphitheatre including some science but more focused on "big fun (sometimes organized by Scienceworks' staff, but during higher visit times will contract outside performers), this year More or Less- free
    - Tours, geared more towards older children and families- free
- **Michelle's description of this year's "Make and Take" activity is Create a Colour**
  - Programs hold 24 kids, there are 3 sessions a day, and they generally fill up by noon each day (next season looking into doing 4 sessions possibly)
  - Children dress up with gloves, jackets, glasses
  - Parents can stand behind glass walls and take pictures
  - Find that 30 minutes is a good time amount, often 45 minutes attention span is a little too long for a 5, 6, 7 year old (When asked if there were any longer programs, only one's were educational programs, such as robotics, that are an hour long)
  - Thinks that locals come back each season because they know there will be new information and new exhibits each holiday. Local families come about once a year, but sometimes more.
  - In the past, circus themes have been very popular
- **Layout and Opinions on Experiment Zone- "Create a Colour" Activity**
  - Laid out in large room with 6 tables, section with glass windows convenient for parents to take pictures, parents seemed excited to be able to watch their children doing experiments
  - Kids all wear glasses, gloves and aprons
  - Many volunteers, one for each table, ratio of 1 volunteer to every 4 kids
  - **Instructor asked several questions**:

        - "Who has performed an experiment before?" -all but about 5 or 6 raised their hands
        - "Who's been to Scienceworks before?- many said they had
        - "What is chemistry?"- about 4 raised their hand
        - "What sense do indicators appeal to?"- about 6 raised their hand
        - "What is this?"- half raised their hand
    - While instructor is talking, about 5 kids distracted or not paying attention at all
    - Instructor gave brief description of acids and bases, indicators, and a safety talk
    - Instructor then tested cabbage water indicator of 3 different chemicals (soy flakes, water, vinegar) then explained chart using beakers as examples
    - Kids working in pairs, asked to team up
    - Very guided, instructor on microphone
    - First, predict if lemonade is an acid or base. One volunteer at each table to help the children squeeze 20 ml into beaker (practice measuring). Then test cabbage indicator.
    - Next predict if toothpaste, sodium bicarbonate, and cream of tartar are acids or bases.
    - **We had many thoughts when discussing Create a Color with each other**:
        - All children are participating but some seem quite confused about "acid is a sour, base is slippery"- not a clear comparison, especially saying that an acid is sour when you aren't supposed to put anything in your mouth when in a lab
        - Also may only think acid is red and base is green. Even this is confusing when told to use the words acid and base
        - The overall content is too high for the young children
        - Gloves don't fit (all too big) makes it difficult to write
          All seem to enjoy the program, but not listening to presenter, just wanting to do experiment. Think she should have explained experiment while children were in the circle and she had their attention
        - Volunteers are necessary and explain mostly everything without having children pay much attention to instructor on microphone.
        - Kids seem to enjoy when they can measure out solid, add water, then add the indicator (rather than just mixing two liquids together). The more interactive the better
        - Many kids seem to fall behind, not enough time to do things themselves because speaker is too fast. Some kids fly through it, younger kids may just like it because things change colors, one volunteer says the experiment is not organized well enough
        - Instructor has used a script to memorize the procedure causing her to rush, kids easily fall behind, instructor rushes through procedure because of time constraints
        - At the end when the instructor creates an mini eruption (bubbles overflow over side of beaker), all kids seem excited

        - After the program, some kids just dump worksheet off, while some seem excited to show their parents the paper, many explain how the color changes but most can't explain why it changed color very well
        - Talk to some volunteers afterwards said most kids enjoy it, not sure if they all understand it. One volunteer told a story of one boy who didn't want to come in last week but ended up enjoying the program after all
    - **Lucas thinks**: the overall point of the activity is for children to make predictions and then observe the actual results, however this becomes lost on them when using a tough concept which is relatively hard to understand at age 5 or 6, this could have been simplified by stating that some reactions cause color change and then skip the prediction step to show how some turned red, blue, green, etc.
- **Layout and Opinions on "How Tall, How Small" Activity**
    - Children use meter wheel or tape measure to measure various drawings out in the courtyard, they can then compare these measurements to their height
    - As it was near the end of the holidays, the exhibition was worn, painting looked quite faded, staff said not as popular as some previous family fun activities
    - Parent walked up, had just done program with child but neither understood it. Once they re-read the description, they appeared to understand it, child seemed interested in trying it again but both were too tired
    - Not exciting or aesthetically pleasing
    - Information table was in one corner and actual activity did not have labels on it, could be improved to be more exciting
- **Layout and Opinions on "More or Less" Activity**
    - Amphitheater was about a quarter full, approximately 70 kids
    - When asked the question "what sorts of things do we measure?"- about 8-10 people raise hand to try and answer
    - Kids excited to participate in "who can be the loudest"
    - Performer calls down to measure a line of the floor in "feet", kids excited to go to the front and see people in different sized shoes
    - Introduces imperial system
    - "Who thinks bowling ball is heavier than book?"- almost all participate
    - Kids place cans in one carton to balance out a bowling ball
    - Measure speed of rockets, all seem excited about this
    - At the end of the presentation presenter set off rockets, exciting for all, unable to understand how related to measuring because they didn't measure the speed
    - Presenter was boring and didn't seem very enthusiastic, was scripted

Heide Museum of Art

Contact: Christine Healey
Chair: Brie Rawson
Scribe: Erika Ortiz
Date: 4/2/2011

Holiday Programs

- **Program Operations**
  - **Location**
    - Confusing to get to
    - Upon arrival, no clear path with signs
    - Exhibitions were quite small, they didn't have a lot of room
  - **Exhibitions**
    - Strange and not impressive
    - Not ones that directly targeted children
    - By two or three artists only
    - Only a couple people were there
  - **Capacity:** 15 to 25 children, impression that programs did not always fill
  - **Cost**: $30.00 for 2 ½ hours
    - Book upon arrival or over the phone
    - Website cannot handle bookings
  - **Duration**: Run one program per day, held at a classroom separate from the exhibition area
    - Originally had 5 programs but expanded it to 8 programs per season
    - 2 weeks worth of programs
    - Programs used to be 3 hours long, now are 2 ½ hours long, want them to be 2 hours long
      - They do take the children to go play outside after the activities
  - **Return Rate**: ½ the children that had visited last holiday had never been there before
    - High return rate – kids come multiple days in a row
  - **Motivational purposes:**
    - The intention is not educational, it's more of an informal type of education
    - Mentioned some parents had seen it as day care, but it's not
  - **Artists are the ones who give ideas for workshops**
    - Artist pitch idea to Christine, they are the ones who run it
    - Have volunteers that help out
    - She feels like the artists sometimes struggle with interacting with the children
    - Believe puppeteers understand how to deal with children better
      - Always have a good mood
      - Pay closer attention to the children, seeing as sometimes artists keep to themselves rather than interacting with others
  - **Have other organizations come in to execute activities as well**
    - Exhibition goes along with the activity
    - Examples of activities:
      - [she gave us brochures about the different past holiday programs]

        - Had a snake catcher bring in crocodiles, snakes, lizards - the kids were able to observe and draw the different animals, which is what made it interactive
        - One activity had to do with butterflies
    - Repeat activities if they are popular, like the snake catcher one
    - Looking through Melbourne's Child to incorporate some science-based programs – want to integrate science into the programs
    - Find presenters on *Melbourne's Child*
        - Mostly bring in organizations that will add something extra to the artists workshop
- **Child's behavior:**
    - Noticed that children with an interest in the arts tend to be more well behaved
    - First timers tend to be more rowdy and loud
- **Success of the holiday programs:**
    - Feels like they are successful because of the high return rate
    - Generally the kids seem to enjoy the activities
    - Kids are focused for that amount of time, but if they were to run any longer she feels like the kids lose interest and just want to go play outside
    - Believes variety is the key to the programs
- **What makes the programs unique**
    - Provide children with a hands-on experience
    - Convenient and cost-efficient
    - Compliment something they would be learning in school
    - Make-and-take activity
        - Not always, depends on the materials the kids use
        - Sometimes the activities require the use of materials which the kids can't take home with them
        - Parents expect children to take something home with them
        - Depends on teachers needs, like the materials needed

- **Why parent's chose Heide:**
    - Most parents are interested in the arts, so they bring their children
    - Appears like the parent's are the ones who motivate their children to go to Heide
    - Bring children because of the museum's reputation
    - Kids get to meet and work with the artists that are being exhibited
- **Advertisement:**
    - Advertisement is free
    - Have issued a marketing survey but the holiday programs have not been formally assessed
    - Word of mouth
    - Brochures
    - Newsletters
    - Online subscriptions

Melbourne Museum

Contact: Adrienne Leith, Senior Programs Officer
Chair: Erika Ortiz
Scribe: Brie Rawson
Date: 4/2/2011

General Museum Information

- **About the Museum**
  - Museum does many travelling programs- visit prisons, elderly people, schools
  - Associated with general audience programs, school programs, tours, lectures
  - Different features of the museum include: wild touch trolley, dinosaur trolley, stuffed hose, senses trolley. These are designed to heighten the experience by not only having displays you look at, but also making the exhibition more interactive
  - Special events- Romp and Stomp for children under 5
  - Member events are important to museum in terms of funding
  - Morning tea for immigrants who may be intimidated by the museum, need help learning English, free
  - Visually and hearing impaired programs
  - Usually during the holidays there is a performance, this year there wasn't one Other film festival- for and about people with a disabilities
  - Museum is state funded
- **Holiday Programs – Program Operations**
  - **Duration**: Runs Sunday, December 26 – Sunday, February 6 from 11:00am-3:00pm
  - **Themes**: Programs based on natural and social history
  - **Cost:** Adult cost is $8 to enter museum, children are free, all programs are free
    - No booking needed to participate
  - Staff mentioned how they watch some children grow up, open for 10 years now, members keep coming back over time, know names and see them come back each year
  - Staff creates and organizes the holiday program but the volunteers deliver it (500 volunteers)
  - School holiday programs change per holiday (4 holidays throughout the year)
  - Summer- activity and activity center themed around an idea (new exhibit)
  - Programs are informal, do not follow VELS
  - This holiday the exhibition focused on dynamic earth, collection of rocks and minerals
    - Rock on Summer- set up just for school holidays, "immersive experience", make and take activity
    - In training, the staff worked out what key messages that Rock on Summer should provide, these keys would guide the volunteers
    - Activity created for all age groups

        - "Create earth capsule", works for multiple ages. To make capsule, but different earth elements into clear container so student can each make a jar with the different layers of the earth
            - Age 2, kinesthetic experience, can pour sand into cups, volunteer repeat s the word "sand"
            - Little older, talk about shells, fossils, say sedimentary, introduce words
            - Even older, talk about different minerals and rocks and their formations
        - One side of the room has a table with different variety of rocks to touch and talk about
        - Another side of the room has a quite area with bean bag chairs and books of rocks and minerals
        - Will make 12,000 rock capsules at end of the school holidays (each one has to be under $1 cost for the museum)
        - Parents not allowed to drop child off, stay with them
        - Will see anywhere from 100-400 children each day (8 volunteers)
    - **What makes the programs unique**:
        - Accessibility and a wide range of target population, reflects content in the exhibition, not dependant on age, is pitched to children, scale content of activity area, appeals to different backgrounds, skills, knowledge
    - People love school holiday programs, build into people's school holidays
    - **Other exhibits include**: Forest Gallery, Mind and Body, Dinosaurs, Wildlife
- **4 Motivation Sectors**
    - **Museum created this in order to make sure they were targeting all types of people**. They divided people into the following categories:
        - Inspirer: come to opening, by a lot, mover and shaker
        - Duty bound: create social/educational situation for the group they are with, social time but also doing the right thing for their family
        - Easy rider: come because friends/group is coming for a good time
        - Informer: want knowledge of everything at museum, want to read everything, come alone or break off from group
    - **Example of how they appealed to each audience**: A Day in Pompeii Exhibition
        - Inspirer: Champagne Party for opening, special night, put high end jewelry in the shop
        - Duty bound: Pamphlet with questions that need to be answered, bring pamphlet home for further discussions
        - Easy Rider: Immersive, built city of Pompeii, this is what strip looks like, graffiti on walls, don't need to really read anything, still emotional journey from before it was destroyed to after

        - Informer: Catalogue, long interpretative panels, investigative, articles on website for people to read before hand or afterwards
    - An idea why people may bring their children to any holiday program- ideals of broad education, science being a balance against sports and arts

Melbourne Zoo

Contact: Laura Vissaritis, Education Officer
Interviewer: Lucas Smith-Horn
Scribe: Peter Chunis
Date: 11/2/2011

Holiday Programs

- **Program Operations**
  - **Duration of the programs**: 8:30am – 3:30pm
    - Long day for children
    - Multiday programs: Not really considered because they book out so quickly. Children usually come more than once anyway.
    - Running a program one week before scheduled time: Choose not to do that. They can pay keepers for one day to do behind the scenes. Increased prices mean increased expectations.
  - **Age Ranges**: 5-12 years old
  - **Capacity**: Maximum of 30 kids; not mixed
    - Find that it is difficult to split kids into age groups; usually break into groups of 4-5 for most of the day but they are still in a group of 30 for parts where the difference in age can be a factor.
    - Hard to engage 5 and 12 year olds at the same time
  - **Staff**: 2 leaders and 4 volunteers; usually spend one year worth of training here before they move on usually to teaching. The ration of staff to children is good.
  - **Themes**: Programs are usually split into different themes - three total, and they rotate daily
  - **Facilities & Location:**
    - Working to be a sustainable environment to save wildlife and conservation
    - Children usually go to the Education building or go to the Campsite somewhere in the zoo
    - Aim is to become a Carbon neutral zoo by next year
    - Travel Distance: Going to start asking people how far they travel so they can become carbon neutral. Most kids really want to be here
  - **Activities**: Do Arts and Crafts activities that are based on conservation
    - Have many campaigns such as “Don’t Palm Us Off” and “Seal the Loop”
    - Children sometimes take these campaigns to school and at home
    - Children also make enrichment items for gorillas. Almost like “care packages” for them. A keeper puts the boxes in the gorilla cage and the children watch the gorillas find their box.
    - Also set up clues and riddles throughout the day so the kids get a unique experience.
    - Kids love the arts and crafts. They are mostly about conservation now, but they used to be anything fun.
  - **Benefits:** Children get a Zoo Adventurer’s hat and certificate
    - They also get special VIP passes to go behind the scenes and see what zookeepers do when the animals aren’t in the exhibits
    - Adds a sense of learning to the program beyond the unique experience of the program.

- Overall it seems like a fun program for the kids
- **Cost**: $58.00 per program
    - Books out about 6 weeks before the programs
- **Popularity**: Had trouble gaining popularity in the past but the problem has been fixed
    - Waitlist of about 200 people
    - Children return all the time to different programs, often everyday
    - Sometimes parents use it for childcare, but they come back from year to year
- **Strength**: Children get a unique experience behind the scenes for a low price. Usually have to pay hundreds of dollars for this experience. Also a very unique environment
- **Weakness**: Mixed age groups. Children have different friendship groups, siblings, etc. Understaffed when children go behind the scenes. Werribee offers programs for children 12-17. Healsville is tricky to get people to come every day. Getting there is a hassle. Don't think they are very popular. Need more professional development with the staff. Many are secondary teachers and they find it difficult to deal with primary school children. Still, very happy with the way they are.
- **Parents' feedback**: Used to do evaluation forms but not anymore. Assume that the programs are good because they book out. Hard to make every parent happy.

Questacon

Contact: Graham Smith
Interviewer: Briana Rawson
Date: 18/2/2011

Holiday Programs

- **Stopped doing them in Canberra about 2 years ago**
  - Too high of cost for Questacon to run
  - Were not reaching all of their audience
  - Holidays are extremely busy and were taking too many staff away from visitors
  - Programs were very popular and always booked out
  - Need more floor space
  - Programs did range in themes, flight, marine, etc.
  - Included designing, building, hands on, lecture
  - Almost 3 quarter of a day, parents drop off, became liability issue because if something went wrong, would insurance cover it, etc.
  - Need more staff to continue holiday programs as well
- **Questacon has outreach and holiday programs in Sydney**
  - Contact is Vanessa Gardos (02 9209 4110)
  - Runs school based and holiday programs
    - Sometimes in conjunction with Australian and Powerhouse Museum
    - Museum was doing an exhibit on climate change, asked Questacon to put on a show they had developed about climate change
    - Put show on for 2 weeks, completely booked every night
    - Great exposure is exhibits because they can play off of the exhibits content and presentation
  - Broaden audience through outreach programs, biggest outreach programs anywhere
  - Good presenters that work in partnership with other organizations
  - Ex. Shopping centre wanted more families, asked Questacon to put on an activity that was science related and featured products that they sold, Questacon modified their shows to fit the needs. Parent's were very interested and entertained and many immediately bought products seem in the show so they could go home and do the experiments
  - Have travelling exhibitions where there are no Questacon staff, like Measure Island we saw at Science works, 12 of them, 700,000 to 800,000 people see them
  - Have staffed programs where at least 200,000 staff members are overseeing them
- **Centre Canberra is more like Scienceworks**
  - 300,000 visitors a year
  - Extremely busy during holiday's
  - **Put on special events in the centre during Holidays**

        - Dr. Scar (scientist in biology) sets up table in foyer, uses make up to apply scar tissue, talks about injury and first aid
        - Long queue of children lined up to "get a black eye"
    - During school, many school groups bring children there
    - During holidays, much different audience, mainly family groups, modify what is offered to adjust for that
    - No individual bookings anymore
    - $20 for adults, $15 for children
    - Large membership base (includes members magazine, members room, cost savings)
    - Want people to leave enthused and inspired about science, have a positive outlook on science, students attending program will choose science courses and careers in their future
    - Believe that people need to have a positive outlook on science in general, general advocacy for science
    - Science and Australia do not generally go together, but do have a high amount of science here
    - A prime goal is NOT to have children know hard data or facts, but more have an understanding and appreciation for science
    - Do a mixture of focus groups, 90% say their visit was worth while and good (those who don't generally complain about parking, too many people, or they did not like the café)
    - **What works for them**:
        - Targeting their audience, good alignment of median and message, knowing the target audience and knowing what your trying to achieve before the program starts (stopping the holiday programs was a part of this)
        - Safety is not taken for granted, risk assessment
        - Making the program accessible
        - Keeping audience interested
        - Forming partnerships
        - Keeping up to date on what everyone else is doing
- **Science Circus**
    - Portable trailer run by 16 university students, have 50 exhibits, travel around to get science communication degree for 44 weeks, learn how to run traveling exhibition, busy and intense year, university course, traveling science, training
    - Schools book them, each student gets ticket, can go to public venue, mini Questacon in town for a few days
- **Inspiring Australia Toward a National Strategy for Engagement with the Science**
    - Good publication to look over
    - Questacon is implementing that strategy reading this will be a good idea of why they do stuff
    - Mainly discuss what science communication is trying to achieve

- National Science week, over 100,000 events reaches 1 million people, worth having look at what context is
- Thinks there is a deficit for appreciation for Australia being a scientific contributor
- **Overall goal**: general population should appreciate science

Appendix K: CSIRO Staff Interviews

CSIRO staff member:	Cath
Interviewer:	Peter Chunis
Scribe:	Lucas Smith-Horn
Date:	16/2/11

	Questions:	Answers
1	How long have you worked at CSIRO?	Just over 3 years
2	Have you worked the Holiday Activities since you started?	Yes
3	What do you like about the CSIRO's Holiday Activities in terms of structure?	
	g. Length of day?	Timing is good for staff, parents do not always like this timing because of their work schedules but it falls into the staffs nicely 10-4 plus an hour of prep and clean up.
	h. Three programs per day?	Three of four is good, more prevents depth and less makes them bored at least in a group like this in a wide of range of kids.
	i. Item?	(This question was not asked)
	j. Placement of lunch and tea times?	Morning tea breaks up the flow a bit, two teas might be overkill but it is an expectation and it is necessary for the younger kids.
	k. Number of children?	It is a good number, 20 would be ideal but almost too few.
	l. Number of staff?	Four is great and allows for breaks, good for safety too.
4	Difference between Holiday Activities and School Programs	(This question was not asked)
5	What do you dislike about the in terms of the same things?	(This question was not asked)
6	What do you think about the topics covered?	(This question was not asked)
7	What improvements can be made to the programs?	Structure should vary more because the current one (intro, activities, conclusion) all in 75 minutes can put barriers on what you do. Thinks the structure should be more flexible to add in a longer activity and a little more time to better plan the activities would be nice. She would like take home items to be a little nicer, but this causes prices to rise, currently there are three take home items so a possibility

		would be to make this into one or two better items.
	d. (If applicable) how would you do this?	[redacted]
8	Why do you think parents bring their children to the Holiday Activities?	People bring their children to Holiday Activities in general because they go to work. People bring their children to CSIRO's Holiday Science Activities over daycare because it's educational and parent wants the child to be interested in science or the child has an interest in science.
	a. Would you consider the Holiday Activities successful for CSIRO?	They are a success for CSRIO because they get to see the children go home excited and then come back. Also because it helps the NPO finances. The programs are inspiring and engaging for children and they want to come back so it is a positive experience.
	b. Do you think parents consider the programs successful?	Yes, children go home excited and come back the next year.
	e. Compared to the school programs?	(This question was not asked)
	f. Why?	(This question was not asked)
9	What do you think of the idea of a multi-day program?	This could be really cool because more depth is reached and with this you can access more exciting things because you are starting to understand all of it; however, this requires a lot more work on CSIRO's part including more prep time, and it isn't fun to have the "bad" children come back the next day. Also if the child is disinterested then the child has to go back the next day and more than three days is too much, anything less must depend on the format because you cannot do the same thing every day.
10	Do you think children understand most of the information presented?	70% are following the instructors, intermediate is at least 80%, little learners is too hard to tell although they do surprise you with how much they understood. Some intermediates get bored because the information was too easy for them f they are interested in the subject and already know everything you say.
11	How would you define impact?	Excitement:: enjoy science but won't actively search for more about them Interested: enjoy science and will look for

		more science information however, excitement can lead to interest
12	Do you think children are more interested in science after completing the Holiday Activities?	Children leave excited about science, not more interested.
13	Has a parent ever come up to you to negatively comment on the programs?	Parents suggest time changes, suggest more staff (difficult children), parents sometimes ask for more depth because of parent or child interest.
14	Have you ever worked science holiday programs hosted by other organisations?	Yes
	d. Where?	Monash
	e. What did you like and dislike about their holiday programs?	Liked that they were not full day and that there was more flexibility in planning the programs. Disliked being the only staff member instructing up to 20 children
	f. How do you think CSIRO's Holiday Science Activities compare?	CSIRO better fills parents expectation and have better resources and CSIRO is more convenient because it's almost all day, Monash also has less space Both are good.

CSIRO staff member:	Gemma
Interviewer:	Erika Ortiz
Scribe:	Peter Chunis
Date:	17/2/11
[redacted]	

	Questions:	Answers
1	How long have you worked at CSIRO?	2 Years at CSIRO (since last November)
2	Have you worked the Holiday Activities since you started?	Have not worked any programs other than Holiday Activities.
3	What do you like about the CSIRO's Holiday Activities in terms of structure?	The structure is very clear. You know what you are doing when it is your time to present.
	m. Length of day?	If the day were any longer, then the kids would get too tired. If the day were any shorter, then it would seem rushed.
	n. Three programs per day?	Gemma likes the activities, feels that they are varied, and keeps the children interested.
	o. Item?	(This question was not asked)
	p. Placement of lunch and tea times?	She feels like they are always eating, but these breaks are needed to set up for the next activity
	q. Number of children?	The number of children is fine. Six kids per staff member are good. If the ratio were less, it would be easier, but they would not get enough money for the organization.
	r. Number of staff?	The number of staff is good. There is always someone for backup, and this allows for everyone to have breaks during the day.
4	Difference between Holiday Activities and School Programs	(This question was not asked)
5	What do you dislike about the Holiday Activities in terms of the same things?	Does not like the exhaustion at the end of the day. Gemma likes that the day is shorter for Little Learners. She says that their structure is fine the way it is.
6	What do you think about the topics covered?	The topics vary on who writes them. It is good to have a bank of topics, as long as kids are interested in them. She thinks that different topics hold a child's interest better.
7	What improvements can be made to the programs**?**	(Cannot think of any)
	g. (If applicable) how would you do this?	[redacted]
8	Why do you think parents bring their children to the Holiday Activities?	Parents bring their kids to the Programs because of their interest in the material.

		They also like the day-care aspect the Programs provide. Gemma thinks that the parents wouldn't send their kids if they didn't enjoy them.
	a. Would you consider the Holiday Activities successful for CSIRO?	The Programs are successful for CSIRO because they constantly book out.
	b. Do you think parents consider the programs successful?	Gemma thinks so because the parents sending their kids back to the programs.
	h. Compared to the school programs?	(This question was not asked)
	i. Why?	Parents keep sending their kids to the programs so they must think it's successful.
9	What do you think of the idea of a multi-day program?	A multi-day program could work, but an overnight program would be a lot of work. Gemma thinks that the continuation of an activity would work quite well, but kids work at different paces. They could finish the activity at home and then bring it back the following day, but there are issues with this. The kids might not finish the activity properly. If the activity needs to be finished by the next day and the kids do not complete it adequately, they could start the next day behind on the activities.
10	Do you think children understand most of the information presented?	The older kids understand the material. The Little Learners might not understand so much. The Juniors might possibly understand the material. Gemma thinks that they could throw less information at the Little Learners. They change the language level between Juniors and Intermediates. They use bigger, more scientific words with the Intermediates. The Juniors tend to be more challenged than Intermediates.
11	How would you define impact?	(This question was not asked)
12	Do you think children are more interested in science after completing the Holiday Activities?	Some children have increased science interest, others come just for fun. The staff presents more to excite the kids. They want to have an impact, but that doesn't always happen. If the kids show no interest, then there is no impact.
13	Has a parent ever come up to you to negatively comment on the programs?	No negative comments off the top of her head (content wise).
14	Have you ever worked science holiday programs hosted by other organisations?	No.
	g. Where?	[redacted]
	h. What did you like and dislike about	

	their holiday programs?	[redacted]
	i. How do you think CSIRO's Holiday Science Activities compare?	

CSIRO staff member:	Elke
Interviewer:	Erika Ortiz
Scribe:	Peter Chunis
Date:	17/2/11

	Questions:	Answers
1	How long have you worked at CSIRO?	Just over 3 years
2	Have you worked the Holiday Activities since you started?	Only worked Holiday Activities
3	What do you like about the CSIRO Holiday Activities in terms of structure?	
	s. Length of day?	Elke likes one program per day. The programs try to provide kids with science experience. This might target parents who are looking for day-care, but we want kids who are interested in science. The staff gets very tired after 2 weeks. Sometimes the staff is put in the position of a care provider rather than an educator. This is hard work, but they enjoy doing it. They have the same timetable for sites from holiday to holiday. This means that they have the same sites on the same days every holiday. It is easier for staff and parents this way.
	t. Three programs per day?	The number of activities is good. If there were more activities, then the kids wouldn't get enough depth. If there were fewer activities, then the kids might get bored. CSIRO tries to rotate through as many of the sciences during the holidays as possible [chemistry, physics, biology, etc.]. Elke finds it easier to do physics-based activities. They do not do as much chemistry activities because they tend to be messy. They try to avoid activities based on same topic. Usually, parents want to hear different things that their child did during the day.
	u. Item?	If the item doesn't meet parents' standards, or if there is no item at all, parents will say the kids didn't do anything. The kids use the item they made to show parents and other people how it works. It is also a good advertising method, and makes the children want to return.
	v. Placement of lunch and tea times?	Elke feels like lunch comes early, however, it is necessary to set up for the

		next activity. The kids want pizza early. If they do not get their pizza, then they ask about it until lunch time. This distracts the kids from the activity.
	w. Number of children?	
	x. Number of staff?	Number of staff is great. Parents usually say that they like the amount of staff.
4	Difference between Holiday Activities and School Programs	CSIRO does not have the resources to do trial runs and evaluations for Holiday Activities. The programs often change by the end of the holidays. It is unfortunate, but some work better than others.
5	What do you dislike about the Holiday Activities in terms of the same things?	Most improvements that need to be made are administrative. CSIRO needs an online booking system. Currently, the parents send request and Elke calls back. She has been through a lot of feedback forms and finds that the feedback varies from term to term. Some of it is positive, and some of it is negative feedback. Elke finds that parents are usually more critical and flexible about the programs.
6	What improvements can be made to the programs**?**	No drastic changes come to mind. The Programs are getting bigger and they need to adjust accordingly.
	j. (If applicable) how would you do this?	CSIRO needs increased staff for Little Learners. They do have volunteers, but sometimes they are not the best for the job. The Holiday Activities are not the same as school programs. CSIRO cannot do trial runs or evaluations for the Holiday Activities. They often change by the end, and some turn out better than others. They need an online booking system. The current booking system is a pain.
7	Why do you think parents bring their children to the Holiday Activities?	
	a. Would you consider the Holiday Activities successful for CSIRO?	The programs are successful because CSIRO does not have to advertise. A lot of the advertising is through word of mouth. Most parents book back and the responses from students are positive.
	k. Do you think parents consider the programs successful?	The kids enjoy what they do; CSIRO gets a lot of positive feedback. It is the only program that CSIRO makes money from.
	l. Compared to the school programs?	CSIRO generates funding for itself [not for profit]. This means that CSIRO can keep the cost of their school programs

		down. They give schools mail-outs once the schools have booked before. Initially, CSIRO is contacted by the schools.
	m. Why?	CSIRO gets a lot of positive feedback. This tells Elke that the programs are successful for the parents. Since the Programs book out so quickly, Elke thinks that the Programs are also successful for the organization.
8	What do you think of the idea of a multi-day program?	(Answer under "Length of Day")
9	Do you think children understand most of the information presented?	The staff is experienced at communicating science, but a few kids will get lost along the way. Elke thinks that they do follow what's happening, but might the kids might not be able to tell their parents, or remember what they did later.
10	How would you define impact?	Impact/excitement is individual [varies from child to child]. CSIRO gets a mix of kids who want to be here and those who don't. They want to engage children. Elke believes that the Programs definitely have an impact, but excitement in the children is more prominent. Discussion about the activity provides more in depth knowledge on the subject. A successful program needs to find a balance between excitement and knowledge.
11	Do you think children are more interested in science after completing the Holiday Activities?	The kids are more driven to come to the programs. More members of Double Helix Science Club attend the Programs than not (excluding littles). Elke thinks that more kids have interest than not. Children generally have an increase in their interest after completion of the Programs.
12	Has a parent ever come up to you to negatively comment on the programs?	• Elke said that negative comments are rare. One parent wrote a whole page about how one kid ruined the entire day for her child. A father of 2 autistic boys (lots of autistic children we get have Aspergers Syndrome) filed a complaint about our staff. He was very sensitive about his kids being bullied by other kids, and thought that the staff needed better training. Comments like this are mainly only in extreme cases.

		• The most common problem is the booking process. • There was an incident with a trouble maker who grabbed Nicola (another staff member. Nicola threatened to call the child's parents, but backed down after the child calmed down. Elke would not have backed down because of her teaching background. Since then, a warning/discipline system has been put in place. • Age appropriate material is based on presenter. Intermediates might get an extra activity or an in depth activity. Juniors are simpler than Intermediates. They often explain the activities to a higher level with Intermediates. The structure is altered for Little Learners. • Elke said that they get feedback about the items the children take home. This is based on the quality of the item. She states that the value of item varies from activity to activity, child to child, and parent to parent. A higher quality item means that the programs will have to be more expensive. There needs to be a balance between the two. • Victoria vs. Hobart Programs: A woman called Elke asking to book into the Victoria Programs, but she was looking at the information for Hobart on the website. When Elke explained this to the woman, the woman became appalled at the difference in cost and complained. This is just a reflection of the difference in programs between the states.
13	Have you ever worked science holiday programs hosted by other organisations?	Yes
	j. Where?	Science Program in Japan
	k. What did you like and dislike about their holiday programs?	(Did not elaborate)
	l. How do you think CSIRO's Holiday Science Activities compare?	CSIRO's programs are unique. Monash is similar to CSIRO. They do community and school events like CSIRO, but they are much shorter.

		Scienceworks has good activities, but it doesn't move. Parents have to go to their one location no matter how inconvenient it is. CHIP is an elitist organisation. They claim that they only offer programs for those who are "intellectually gifted." CSIRO doesn't go below age 5 in Little Learners because the staff does not have experience with those children (take them to the toilet, separation anxiety from their mother). Most kids have been to school by the time they are 5. This means that they are more independent by this time.

CSIRO staff member:	Sean
Interviewer:	Lucas Smith-Horn
Scribe:	Peter Chunis
Date:	24/2/11

	Questions:	Answers
1	How long have you worked at CSIRO?	This is my 5th year
2	Have you worked the Holiday Programs since you started?	Worked the holidays all 5 years
3	What do you like about the CSIRO Holiday Programs in terms of structure?	
	y. Length of day?	The day is long and it makes for a long 2 weeks. It is an intense time, but it varies depending on the activities in a particular day. Sean would not like it to go longer. The current length is good.
	z. Three programs per day?	CSIRO used to do 4 activities, but 3 activities are good. Fewer activities would not be good.
	aa. Item?	Sometimes they are really awesome, other times they are not. The juggling balls are great! Sean states that the more people who have input on the item, the better the outcome. He would like to see a CSRIO brand (like a sticker) on the item. A higher quality item is a great idea. He thinks that children should participate in one activity that has lots of hands-on activities but not take anything home. As long as the children take something home from another activity, it is alright.
	bb. Placement of lunch and tea times?	Adequate. No more, no less.
	cc. Number of children?	No more than 25. It becomes too difficult with more.
	dd. Number of staff?	No less than what we have. Three staff members would be tiring. The current number (4) allows time for breaks. Breaks make the day easier for the presenters. Volunteers are great, parent helpers less so. The parent usually stands close by their child and vice versa. Volunteers who are closer to the children's age are great.
4	Difference between Holiday Programs and School Programs	(was not asked)

5	What do you dislike about the Holiday Programs in terms of the same things?	No other complaints, but more sites means more driving time. This becomes tiring.
6	What do you think about the topics covered?	He would like to see the activities play off each other more. He thinks that a 1.5 hour session should be spent on making something amazing and ends with a fantastic demonstration. He thinks that the activities need more structure and less mess.
7	What improvements can be made to the programs**?**	(See above question)
	n. (If applicable) how would you do this?	
8	Why do you think parents bring their children to the Holiday Programs?	The CSIRO name is usually associated with high quality. The amount of repeat children is always a good sign. He doesn't know what the price is like at other holiday activities, but CSIRO's activities book out so it must be reasonable. Sean also states that the parents see the programs as "valuable" and more than just an education program.
	a. Would you consider the Holiday Programs successful for CSIRO?	Yes. Constant bookings prove it. There are some sites that do not book well, but are still successful.
	b. Do you think parents consider the programs successful?	Yes because they continue to book their children in the activities.
	o. Compared to the school programs?	(was not asked)
	p. Why?	
9	What do you think of the idea of a multi-day program?	CSIRO tries to get the word out to as many kids as they can. A multi-day program limits the amount of children who can attend these activities. It would also increase the workload of the presenters.
10	Do you think children understand most of the information presented?	Depends on the program and the presenter; however, most children understand the majority of the information.
11	How would you define impact?	
12	Do you think children are more interested in science after completing the Holiday Programs?	He hopes so. There is a double-barrel result. (Interest vs. excitement). He hopes the children are more interested, but he does not know because every group is different.
13	Has a parent ever come up to you to negatively comment on the programs?	Father complained that his child with Aspergers Syndrome was bullied by some of the other children. Strange

		this was that the child had a great day, but some of the other kids were bad. Lots of comments about the late start time and that the activities are too easy/simple.
14	Have you ever worked science holiday programs hosted by other organisations?	Yes
	m. Where?	Scienceworks
	n. What did you like and dislike about their holiday programs?	Some of their items are pretty high quality. He did not like the performances at the amphitheatre. There was little science content. He would like to take their staff to a show in at the museum and observe the people who walk away in the middle of it. It could be a great place for a Holiday Activity. The collaboration with outside groups was great!
	o. How do you think CSIRO's Holiday Programs compare?	CSIRO can out together an activity on anything, while Scienceworks cannot.

Appendix L: Segmentation of Parents

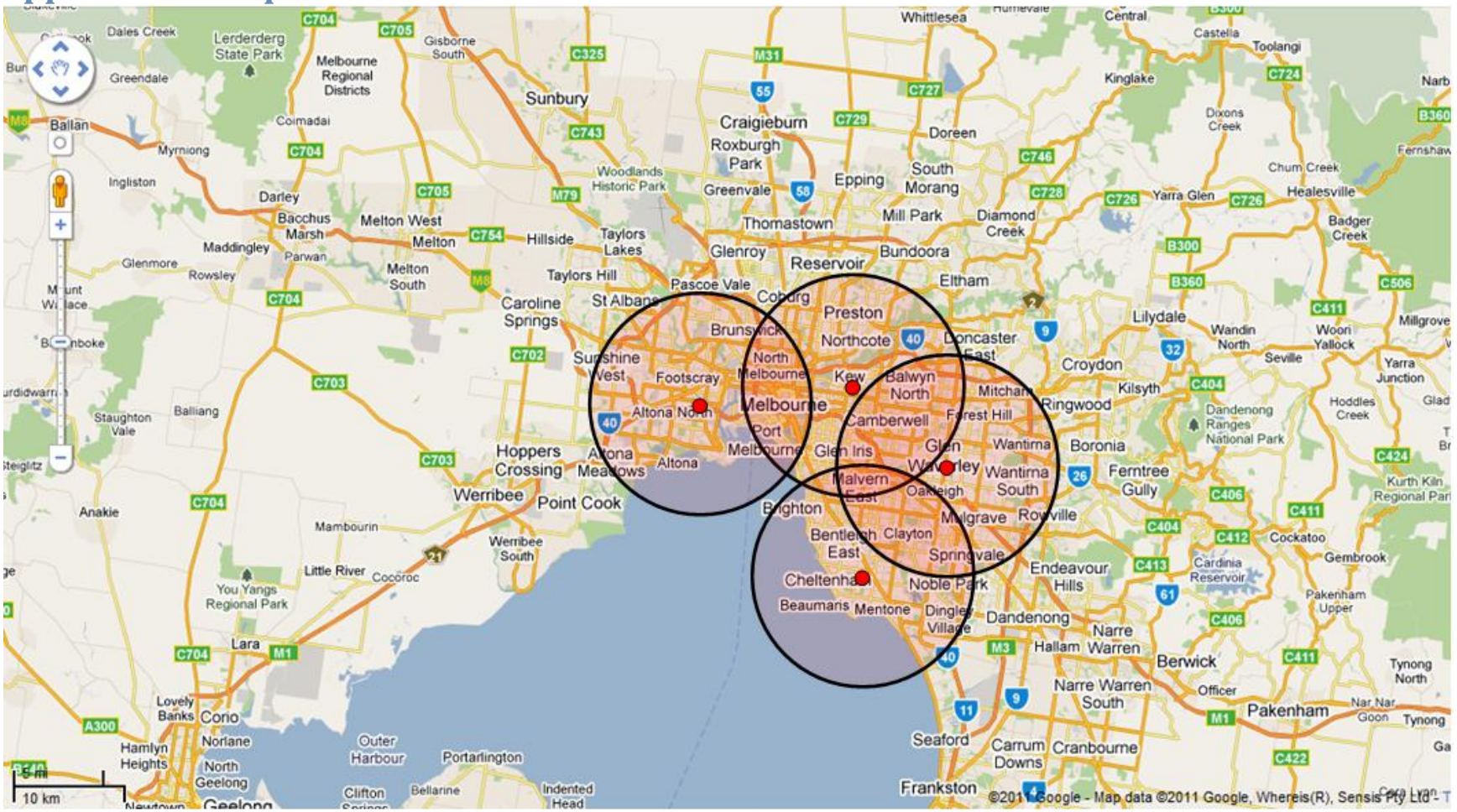
Table 1: Segmentation of Parents

Segment	Number of Parents	Percent of Parents (%)
Segment 1	12	10
Segment 2	57	46
Segment 3	22	18
Segment 4	20	16
Segment 5	11	9
Segment 6	2	1
Total	124	100

Table 2: Segmentation of Victoria

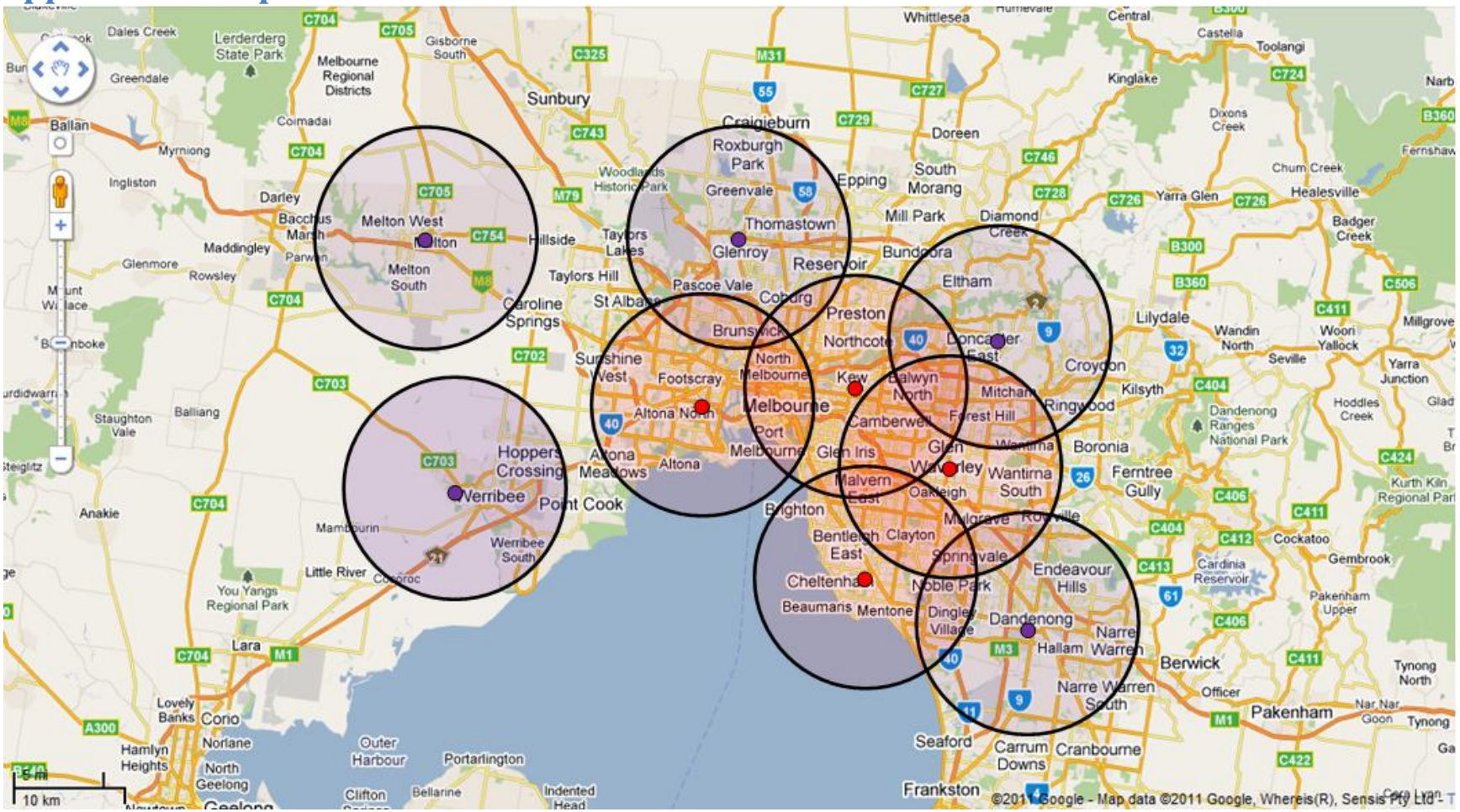
Segment	Percent of Victoria (%)
Segment 1	23
Segment 2	26
Segment 3	16
Segment 4	8
Segment 5	19
Segment 6	8
Total	100

Appendix M: Map of Current Site Locations



Red Circles have 10 km radii and represent the four current sites: Glen Waverley, Highett, Kew, and Yarraville.

Appendix N: Map of Current and Possible Site Locations



Red Circles have 10 km radii and represent the four current sites: Glen Waverley, Highett, Kew, and Yarraville.
Purple Circles have 10 km radii and represent the five possible future sites: Broadmeadows, Dandenong, Manningham, Melton, and Western Wyndham.

Appendix O: Correlations of Pre Program Survey Factor Results

α=.05

All CSIRO vs. All Other (p≤)	
Location	**0.03557**
Price	**4.281E-05**
Reputation	0.611
Content	0.458
Safety	0.1771
Child's Interest	0.4962
Friend's Interest	0.1072
Time of Day	**0.005232**
Duration	**0.004908**

Double Helix Members vs. Non-Double Helix Members (p≤)	
Location	0.4721
Price	0.5341
Reputation	0.166
Content	**0.01988**
Safety	**0.01409**
Child's Interest	0.07765
Friend's Interest	0.08441
Time of Day	0.925
Duration	0.995

Have vs. Have Not Previously Attended (p≤)	
Location	0.9781
Price	0.3126
Reputation	0.8568
Content	0.3138
Safety	0.4631
Child's Interest	0.8701
Friend's Interest	0.3175
Time of Day	0.61
Duration	0.2302