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Gathering Teacher Feedback to Improve Informal Education

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Gathering Teacher Feedback to Improve Informal Education

An Interactive Qualifying Project Report

submitted to the Faculty of the

WORCESTER POLYTECHNIC INSTITUTE

in conjunction with the

CENTER FOR EDUCATION AND RESEARCH

IN ENVIRONMENTAL STRATEGIES

of East Brunswick, Australia,

in partial fulfillment of the requirements for the

DEGREE OF BACHELOR OF SCIENCE

by

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Abstract

The educational programs offered at the Center for Education and Research in Environmental Strategies (CERES), in East Brunswick, Australia, provide informal education opportunities for students learning about sustainability. However, without information about teachers' needs and expectations, they are unsure how to develop and evolve their programs. This project gathered feedback to better inform the development and evolution of these programs. We surveyed and interviewed Victorian teachers which led to recommendations regarding the design of their programs and pricing model, and to the creation of teacher feedback gathering tools: a program evaluation and survey for prospective schools. By establishing communication with teachers, CERES can design their programs to meet teacher's needs.

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Authorship

Italicized text indicates Editor

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Executive Summary

An estimated 65,000 students partake in the excursion programs every year at the CERES Community Environment Park, located in East Brunswick, Victoria. However, despite their efforts, CERES does not have a complete understanding of the expectations teachers have for their excursions, and therefore, CERES Education does not know how their programs can evolve to meet teachers' needs. This project sought to obtain and analyze feedback from teachers who had used the excursion education programs at CERES, which was used to develop recommendations for immediate changes, and helped to establish a line of communication that allows teachers to articulate their excursion needs.

Successful environmental education excursions depend on prior expectations, knowledge, and teacher attitudes towards the trip. Articulating these expectations and knowledge requires bi-directional communication between between teachers and excursion providers. This is accomplished through promotional material, website information, mail-outs, or word-of-mouth, which provides teachers with enough information about the excursions to integrate them with their curricula. Additionally, teachers provide feedback through surveys, evaluations and conversations with the staff, which provides the organizations with the information required to develop and evolve their programs.

While CERES provides plenty of information on their programs through their website, brochures, and word of mouth, they are not as vigilant at collecting data on the teachers' expectations of the park. The CERES education staff has an opportunity to enhance the effectiveness and relevance of their educational programs by establishing lines of communication with school teachers, through promotional materials, surveys, and other forms of program feedback.

This project aimed to help the staff at the CERES Community Environment Park gain a better understanding of how and why teachers use informal education excursions, which will allow the park to cater their programs to the needs of Victorian school teachers. This project provided the CERES staff with the means to communicate further with schools and discover the needs of visiting educators, by analyzing insights on informal education from Victorian school teachers and developing survey tools to facilitate the communication of educational expectations.

A round of on-site interviews with visiting teachers and an online survey sent out to a larger population of Victoria-area educators helped to establish teachers' needs for educational excursions. Primarily, these responses were used to identify the criteria or 'blocking factors' that are considered when booking educational excursions, and helped identify where excursions fit into teachers' curricula. After using this information to identify teachers' needs, we compared it to the CERES programs, to see how well each of them were being met.

When booking excursions, teachers primarily choose programs based on their **relevance to the curriculum**. This can mean that either the topics covered by the program match those being taught in the classroom, or that the experience provided by the excursion supports the developmental goals of the curriculum. Interviews with the CERES staff revealed that program topics are selected and designed through personal and informal research and discussion. The programs are **not designed to relate to school curricula**, and that any current curriculum relevance occurs out of pure coincidence.

Teachers also chose programs based on how well the program **engages students with the subject matter**. Among other program characteristics, student engagement helps enhance the learner's abilities, and is provided through hands-on activities, rather than lectures or presentations. Fortunately, CERES incorporates hands-on activities as the most important feature of their programs, which means **student engagement is fundamental in the design of their programs**.

A major consideration, though largely out of the teachers' control, were the economic factors, including **price and proximity**, which limited the autonomy teachers have over the selection of their programs. The CERES excursions follow a pricing model based on funding distribution and profit margins, but **do not offer discounts or incentives** for distant school or those who cannot afford an excursion. It was also mentioned that competitor programs prices are taken into account when setting excursion prices, and a cost comparison against seven similar excursions found that **the prices of CERES excursions are competitive with other organizations**.

From these initial findings, we developed a number of recommendations:

- **Reference local curricula when designing programs and activities.** By using curricula such as the Australian National Curricula or the Victorian Essential Learning Standards to influence the design of the CERES excursions, teachers will find them easier to integrate with their classroom subjects

- **Continue to design programs to be "hands-on".** Teachers overwhelmingly pointed out that they choose CERES because of the engaging activities they provide, and this is reflected in the design of the excursions.

- **Consider a partnership with a transportation company for distant schools.** Many schools expressed concern over the cost of transporting students to the park, but there is little flexibility in the excursion pricing model to allow a discount while maintaining their profit margin. Partnering with a transport company may reduce costs and overhead for booking teachers.

Along with these concrete recommendations, we located some potential venues for future analyses, that we were unable to include within the scope of this project

- **Analyze trends in the excursion booking data.** The database containing information about program bookings was unavailable at the time of this project, and could have been used to discover popular programs and other trends. A future analysis with access to this data may yield interesting results.

- **Perform a more detailed financial analysis.** This project only touched on one piece of the financial status of the CERES excursions. As excursion cost was very important to the teachers surveyed, additional financial analyses could be beneficial.

- **Evaluate and audit the excursion marketing strategy.** This project centered around retrieving information from teachers, however, communicating program content to teachers is equally important in the cycle of program evolution. An additional project could analyze how the programs are marketed, and the how difficult it is for teachers to integrate them with their curricula.

Over the course of the project, we discovered just how critical teacher feedback is to the development and evolution of informal excursion programs. Without this important line of communication, by which teachers may articulate their expectations, the CERES staff could not understand how well their programs met teachers' needs, or how they could improve. In our short time at the park, we collected valuable information from teachers that allowed us to identify some important discrepancies and provide a few concrete recommendations.

Aside from these specific recommendations, this project is evidence of the importance of gathering feedback from teachers. However, our data gathering techniques were not without limitations, and if revised, have the potential to offer even more useful information. Therefore, CERES should continue to pursue communication opportunities that allow them to understand their customer base

more completely. We have suggested two options that help to establish this line of communication, a program evaluation form and an additional survey, which we hope CERES will improve and implement, along with other lines of communication beyond our suggestions.

1 Introduction

The Earth maintains its ability to sustain life through several complex, interconnected, planetary systems. However, the exponential increase in human population and activity puts additional pressure on these systems, and may cause them to destabilize, resulting in massive, unpredictable environmental change (Rockström et al., 2009). Sustainable development seeks to address current resource needs without compromising the security of future environmental resources by reducing the effect humanity has on these ecological systems.

Education for sustainability is a critical avenue for promoting sustainable development. It provides the knowledge, skills and world-views necessary to allow people to assess their sustainable development concerns and make informed decisions (UN Department of Economic and Social Affairs, 1992). However, as sustainable development requires consideration of a large number of interrelated ecological, socio-political, and economic systems, sustainability education is a multi-faceted topic that cannot be taught as a discrete learning domain, making it difficult to integrate with existing school curricula (VCAA, 2009).

Experiences that arouse emotion, challenge beliefs or enhance environmental conceptions have been shown to be the most effective at influencing the adoption of sustainable practices. Informal education provides opportunities for students to engage with the subject matter on a more fundamental level, which helps to promote environmentally sustainable attitudes and behaviors by allowing learners to explore and develop their environmental knowledge and world-views (Ballantyne & Packer, 2005). However, successful environmental education excursions depend on prior expectations, knowledge, and teacher attitudes towards the trip. Articulating these expectations and knowledge requires bi-directional communication between between teachers and excursion providers (Anderson, Kisiel, & Storksdieck, 2006).

The Center for Education and Research in Environmental Strategies (CERES), located in East Brunswick, Victoria lends itself to schools as a resource that provides programs on a wide variety of topics relating to sustainability, including environmental protection, alternative energies, and resource efficiency. While they provide plenty of information on their programs through their website, brochures, and word of mouth, they are not as vigilant at collecting data on the teachers' expectations of the park. CERES has an opportunity to enhance the effectiveness and relevance of their educational programs by establishing lines of communication with school teachers, through promotional materials, surveys, and other forms of program feedback.

This project aimed to help the staff at the CERES Community Environment Park gain a better understanding of how and why teachers use informal education excursions, which will allow the park to cater their programs to the needs of Victorian school teachers. This project provided the CERES staff with the means to communicate further with schools and discover the needs of visiting educators, by analyzing insights on informal education from Victorian school teachers and developing survey tools to facilitate the communication of educational expectations.

2 Background

In this section various topics are discussed such as, a brief history of sustainability education in Australia, Australian curriculum standards, sustainability as a cross-curricular perspective, sustainability as promoted by informal education, communication between informal and formal education, and information about CERES.

2.1 Sustainability Education

Sustainable development is an evolving and complex issue that has garnered increasing global attention with the end of the 20th century and the start of the 21st (UNESCO, 2004). Sustainability is recognized as a process that requires the moderation of resource use to prevent the exhaustion of the planetary resources (Tilbury, Stevenson, Fien, & Schreuder, 2002). The growing consciousness of of planetary resource limitations and physical boundaries has helped to provide the concern for sustainable development with a greater sense of immediacy (Rockström et al., 2009). Sustainability is a multi-faceted topic, with political, social and environmental jurisdictions. As a result of the scope of topics that it encapsulates, it cannot be treated as a discrete learning domain in the same manner as traditional subjects.

The role of sustainability education in the addressing the problem of sustainability was addressed on an international level in Agenda 21, a comprehensive plan of action constructed by the United Nations Department of Economic and Social Affairs (UN Department of Economic and Social Affairs, 1992). This international plan placed strong emphasis in the role of education in the pursuit of sustainable development, in order to foster a healthier coexistence between society and the environment (UNESCO, 2004). Chapter 36 of Agenda 21 outlined three major focuses that education should play in combating the complex topic of sustainability: reorganizing education to address sustainable development, promoting public understanding and awareness, and training educators in the field of sustainable development (UN DESA, 1992).

Truly effective sustainability education should rely on more than formal methods alone, and should instead immerse students in opportunities outside of classroom learning, and focus on interpersonal development (UN DESA, 1992). Education for sustainable development encompasses a wide variety of topics including environmental preservation, conservation, stewardship of planetary resources, social and cultural contexts, and also aspects of environmental and systemic change. (UNESCO, 2004). As such, teaching sustainability effectively requires more than quality content and organization, it requires a fundamental shift in attitude and the way that people think and feel. It requires whole systems learning in order to understand the relationship between people and the environment (Galea, 2004).

2.1.1 Australian Curricular Standards

In Victoria, Australia there are three curriculum standards that schools are practicing, the Victorian Essential Learning Standards (VELS), the Australian National Curriculum, and a hybrid curriculum called the AusVELS. The VELS and the Australian Curricula are similar in the sense that they cover almost exactly the same learning focuses, but the structure and format of both is considerably different. The AusVELS curriculum is a transitioning curriculum for schools that are changing from the VELS to the National Curriculum, and is structured similarly to the national curriculum, yet follows the VELS more closely.

Australian curricula standards for learning have changed somewhat recently, inspired in part by The Melbourne Declaration on Educational Goals for Young Australians, which recognized several global changes that are placing new demands on Australian education. As a result of this declaration, sustainability was identified as being one of the more prominent issues that should be taken into greater consideration in school curricula (Ministerial Council on Education, Employment, Training, and Youth Affairs, 2008).

The Australian Government released a national plan of action in 2009 that attempted to equip all Australians with the knowledge and skills necessary to live sustainably. The plan had four objectives, to institute more sustainability based initiatives, reorient formal education systems to include greater sustainability focuses, encourage awareness in businesses and industries and promote community stewardship through informal and nonformal learning institutions (Australian Gov. Dept. of the Envt, Water, Heritage and the Arts, 2009).

2.1.2 Sustainability as a Cross-Curricular Perspective

Sustainability is included as a learning process instead of a discrete subject in both the VELS and Australian National Curriculum. Both have established tha-t sustainability cannot be taught in the same manner as traditional subjects such as Science, Technology, English and Math. The Australian National Curriculum lists sustainability as a cross-curriculum priority, and provides 'organizing ideas' that are used throughout the curriculum which provide the essential knowledge, skills, and understandings to be included in the curriculum domains. It also provides a more detailed analysis of how sustainability should be integrated within English, History, Science, and Mathematics (ACARA). The VELS also list sustainability as a cross-curriculum perspective, and similarly seeks to provide knowledge, skills and understandings regarding sustainable development, with the intention of preparing students for a sustainable future. The VELS provide a table organized by grade level, with excerpts from its various domains that relate to sustainability (VCAA, 2009).

2.1.3 Sustainability Education promoted by Informal Education

In order to successfully teach sustainability, it is necessary to employ a range of teaching strategies that address the learner's individual knowledge and attitudes (John H Falk & Lynn D Dierking, 2010). Informal education settings can provide enhanced environmental learning, promote environmentally sustainable attitudes, increase learning retention, evoke emotion or empathy, and promote behavioral change by providing meaningful and educational experiences. When used in conjunction with formal education, or classroom learning, informal education can aid educators in meeting curriculum standards as well as encourage students to adopt sustainable behavior (Ballantyne & Packer, 2005).

Informal education excursions can be used by teachers to support classroom learning, as well as provide students with the opportunity to interact with the environment, and provide access to valuable teaching resources (Ballantyne & Packer, 2005). Nature excursions, for example can contribute to students environmental empathy by simply exposing students to an outside environment and fostering a connection with nature (Roy Ballantyne, John Fien, & Jan Packer, 2001). Sustainable exhibitions and displays, such as those found in museum type settings, can help provide students with information and motivation to explore the social implications of sustainability and also encourage group discussion.

2.2 Informal Education

In the context of educational institutions, informal education may include extra-curricular activities, independent study programs, and excursions to museums, science centers, or other community organizations (Belle, 1982). Education that takes place in these informal, out of school environments, is called informal education. Although informal education can happen within the classroom, through self-guided projects and activities, informal education often occurs through planned excursions to places of educational relevance.

Formal Education	Informal Education
Compulsory	Voluntary
Curriculum-based	Personal Interest
Teacher-directed	Self-directed
Scheduled	Any time
Children & Adolescents	All ages
In-classroom	Ubiquitous
Assessment	No tests or grades

Table 2.1: Differences between Formal and Informal Teaching Modes (Friednam & Mappen, 2012).

Teachers have many incentives to use informal education as it has been shown to aid in meeting VELS, AusVELS, and Australian National Curriculum goals by providing personal development, interpersonal development, and a deeper understanding of Indigenous culture (Martin, 2010). Additionally, informal education can supplement formal education by quantifying classroom topics, provide enhanced learning, and spur interest in curriculum material (Friedman & Mappen; Peter Casebow, 2006). In contrast to formal education, informal education allows for exploratory learning that adapts to the learning style of the student, while also providing depth and resources that formal education may overlook (Alfieri, Brooks, Aldrich, & Tenenbaum, 2011).

2.2.1 Communication between Schools and Informal Education Programs

Informal education programs aid schools by offering themselves as a resource to enhance and expand student learning through different contexts. However, informal education programs have the most impact on student learning when they are well prepared by the program, participate in the program, and when the information learned in the program is revisited after the trip. Also, schools will not properly prepare students for informal education programs if they do not have accurate program descriptions or understand how the program fits into their curriculum (Anderson et al.,

2006). Due to the collaborative required of these two institutions to maximize the impact of informal education, bidirectional communication is essential. There are several ways to create solid lines of communication including feedback forms, visits to school open houses, the creation of a teacher advisory board, the development of a website that allows teachers, and informal education staff to interact and communicate (Anderson et al., 2006).

2.2.2 Educational Excursions

Excursions are a major component of school-supported informal education. They consist of planned visits to a location of educational value by a group of students and their teacher, often to museums, zoos, or community centers. Excursions reinforce classroom material by providing context and practical examples, and may provide resources, including equipment, locations and experts, that are difficult or impossible to bring to the classroom. Excursions provide learning benefits as well, catering to the individual's learning style by allowing students to explore and discover, as well as supporting the cycle of experiential learning (Kolb, 1984; Melber & Brown, 2008).

Though there are many benefits that arise from educational excursions, teachers may encounter difficulties when attempting to integrate them within their school curriculum. As they have less control over the educational content of an excursion than they do in the classroom, they must find out enough information about the excursion to ensure it integrates well with the curriculum unit, and may have to modify their teaching materials to support the excursion (Peter Casebow, 2006). The logistical burden of planning an excursion includes covering the cost of travel and payment for the event, scheduling the excursion to take place at a useful time in the curriculum unit, coordinating with other teachers and administrators at the school, and acquiring permission from the parents and the associated paperwork (Sheerman, 2005).

2.3 CERES Community Environment Park

Founded in 1982, the Center for Education and Research in Environmental Strategies (CERES) is a sustainable community constructed upon a decommissioned bluestone quarry turned landfill in East Brunswick, Victoria. It is a thriving community, urban farm, conference venue, and "Australia's largest deliverer of environmental education" (CERES, 2010). It promotes many sustainable practices and showcases many green technologies, including rainwater harvesting, solar and wind electricity generation, recycling and composting systems.

The mission of the park staff is to "address the causes of climate change, promote social well being and connectedness, build local and global equity, and embrace and facilitate rapid change," which they accomplish through two forms of informal education programs, incursions and excursions (CERES, 2010). These programs provide a specific expertise and knowledge that cannot be found in a formal learning environment.

2.3.1 Educational Program Offerings

A major component of CERES' environmental education is done through educational excursions at the park. During an excursion, knowledgeable staff provide guided informational tours across the park that incorporate a variety of topics and hands on activities. Excursions range from two to four activities and cover a wide variety of topics, under five learning domains: land, water, recycling, energy, and culture.

CERES also offers incursion programs that involve staff members traveling to schools and providing a similar experience to what is offered during an excursion. During incursion programs, instructors involve participants in sustainability workshops, and cover material selected by teachers that complements what the students are doing in the classrooms.

2.3.2 Lines of Communication

Establishing lines of communication between teachers and informal settings is critical to providing effective education programs. CERES communicates its objectives through a website describing the programs and services they offer, including information about the different thematic strands and fliers for programs organized by age group. They also mail a yearly brochure to schools over the summer vacation and attend educational conferences to promote the park.

Although CERES has many means by which to communicate their objectives and offerings, they have no established way to gather information from teachers. The instructor may hold conversations with the teacher on the day of the excursion, but these are informal and unsystematic. Without the means to communicate teacher expectations, CERES has an incomplete understanding of the school curricula and teachers needs upon which to base their programs.

3 Methodology

The goal of the education staff at CERES is to spread their mission for the development of a sustainable future by reaching a larger number of students. This project aimed to provide the staff with an understanding of why teachers use informal education programs such as CERES, and what criteria they use in choosing these programs. In addition, this project sought to understand how the excursion programs at CERES were designed to meet the requirements that teachers have for them, and see what design improvements if any could be made to better accommodate teacher's needs of the programs. The following objectives were established to answer these inquiries:

1. Identify teachers' and administrators' perspectives on informal education, and the criteria used when booking informal education excursions.

2. Compare the CERES excursion programs to teachers' informal education needs.

3. Develop tools to communicate teacher objectives to the CERES staff.

This chapter describes the approaches taken to achieve these objectives.

3.1 Identifying Teacher Motivations for Informal Education

The CERES Community Environment Park can be used by teachers in a variety of ways to fulfill requirements of their respective curricula. The staff at CERES lack a concrete understanding of why school teachers use their programs, and how that links to what they teach in the classroom learning environment. We gathered information from local teachers in order to gain a deeper understanding of the relationship between local curricula and informal education programs. Teachers visiting CERES for excursion programs with their classes were interviewed to get an understanding of what motivations they had for the visit. The responses to these interviews informed the design of a survey that was sent out to a larger population of Victorian teachers.

The combined survey and interview response data provided an understanding of the role that CERES plays for school teachers, and also provided a useful basis for what avenues could be explored for program improvements. The data-gathering tools were designed with the following research questions in mind:

1. What factors do teachers consider when choosing informal education programs?

2. How do teachers use informal education programs?

3.1.1 On-site Interviews

To gain a basic understanding for why teachers visit CERES, interviews were held with visiting educators at the end of their excursions. These interviews provided useful insight that was used in the development of a more detailed survey. The interviews intended to answer the following questions:

1. What is the main reason that teachers bring their classes to CERES?

2. How does CERES fit in with what teachers are covering in the classroom?

3. What are some changes that can be made to better suit the needs of visiting teachers?

Semi-structured interviews with visiting school teachers were conducted at the CERES Community Environment Park. The interviews were held at the end of the excursion programs so that the teachers could better articulate the ways in which CERES programs fit in with material they cover in the classroom, and offer more informed feedback. The interview subjects included teachers who visit CERES regularly, as well as those who are visiting for the first time. Teachers were chosen to be interviewed on site, primarily for convenience, but with the added benefit of being able to ask questions about the excursions immediately, rather than later when memory of the events may have faded.

In order to develop the questions for the on site interviews, it was necessary to first discuss and identify with the CERES staff what sorts of data they would like to know from visiting teachers. The CERES education department did not have a structured process for obtaining feedback from teachers that previously visited the park, which made finding a basis for the interview questions more challenging. Preliminary interviews gave an idea of the motivations teachers had for taking their class on excursions. The interview questions asked of the visiting teachers included guiding questions to help them formulate reasons for their visit in a way that also ranked the importance of the reason. These interview forms can be seen in Appendix A: Interview Questions for Visiting Teachers.

Teacher responses to the interview questions were organized according to the factors they considered when choosing informal excursion programs and how they used the programs at CERES to supplement their curricula. The responses were individually reviewed and grouped into categories with similar themes. This information helped to create a basis for the questions that were asked in the internet survey described below.

3.1.2 Internet Survey

To reach a wider population than the few teachers who attended CERES during the project, an internet survey was sent to a list of teachers collected from the bookings database at CERES who have either previously booked or expressed an interest in booking an excursion. The survey consisted of open-ended and ranking questions, which sought direct answers to some of the research questions. The guidelines for how to produce a quality survey according to the American Association for Public Opinion Research were used to help construct the survey (AAPOR 2012). The guiding questions behind the design of this survey were:

1. Why do teachers book informal education excursions?

2. What do teachers consider to be the purpose of informal education excursions?

3. How does a CERES excursion differ from other forms of informal education?

One of the complexities of the educational offerings of CERES is that the park offers much more than educational programs. From preliminary interview results, we noticed that teachers appreciated the alternative living perspective offered by CERES, and wanted to gather more information on how this differs from other types of guided excursion programs. This was the basis for our third guiding question.

The survey requested some demographic information, including the grade level of the students, the type of school, and the position of the person answering the survey, to potentially chart trends among primary and secondary schools, learning topics, or regions.

If the subject had previously visited CERES, they were brought to an additional page where they were asked to rank statements about how well the excursions at CERES met their expectations. Additionally, they were directly asked to answer our third guiding question by explaining how a CERES excursion differed from other informal education programs that they may have attended. We also collected suggestions from teachers for other improvements.

The final set of questions dealt with informal education, but was not specific to CERES, and all subjects were asked to respond. These were open-ended questions that mirrored our first two guiding research questions. Rather than being CERES-specific, we inquired about informal education in general to allow teachers to draw from a larger repository of experiences, and then we asked how CERES may be different.

The excursion criteria question was left open ended as to avoid leading teachers into answering in a specific way, and at the time, the criteria for visiting was not known. The survey was designed to garner a wide variety of responses that were later categorized so that the questions could subsequently be refined for future versions of the survey.

After the survey was concluded, the open-ended responses were coded to identify common themes, and identify how frequently they were expressed. Additionally, the demographic information was cross referenced with the data to locate trends and common themes among responders from different regions, school types, and year levels.

From the information contained in the CERES electronic booking system, 1,205 unique email addresses of teachers and administrators were collected, and a link to the internet survey was sent. As an incentive to completion of the survey, a 5% discount was offered on future excursion bookings, up to a year after the completion date. The school name of each completed submission was retained to facilitate the fulfillment of this offer.

From the list of 1,246 email addresses, 1075 messages were successfully sent. 52 survey responses were received, a 5% yield. While this data is not sufficient to make claims about the population of Victoria-area teachers, it has provided useful insight into the design and distribution of this type of survey. The number of actual survey impressions may be lower than the number of successfully sent emails, as this number includes messages that may have been detected as spam. The subject line of the email mentioned the discount specifically, and many of the message-unsent responses from email servers

were marked as spam when they were received. Additionally, there is a potential for response bias, as those who respond or fail to respond may have based that decision on the discount offering. This may have lead to an inflation of the importance of cost in our results.

3.2 Comparing the CERES Programs to Teachers' Needs

Based on the data gathered from the interviews and survey, we found that teachers choose informal education excursions based on their relevance to the curriculum, the level of engagement they offer to students, and the cost associated with booking and executing the trip. We gathered information from the CERES staff to analyze how they addressed these considerations. We sought answers to the following research questions:

1. How does CERES Education decide what topics to cover in their excursion programs?

2. How do the CERES programs engage students?

3. How do the cost and payment options of a CERES excursion compare with similar programs?

To answer these questions, we interviewed CERES program designers and administrators, and performed a cost comparison with similar excursion program competitors.

3.2.1 Interviews with CERES Program Designers

Many teachers expressed criteria relating to the program content and design, including curriculum relevance and student engagement, as critical to their booking decision. To evaluate the degree to which CERES considers these factors in the design of their programs, the educators responsible for the design of these programs were interviewed. These interviews were open-ended discussions, but proceeded with the intention of answering the following questions:

1. How are program topics selected?

2. Once a topic is selected, how is a program designed to cover these topics?

3. How do programs engage students?

4. How do programs evolve over time?

The responses to these questions helped to explain how the programs are relevant to the curriculum and how well they engage students.

3.2.2 Interview with CERES Education Manager

Price was found to be one of the more important criteria that teachers use when selecting informal education programs. To understand how the price of the excursion programs were determined and how funds were distributed between staff and resources, Judy Glick, the education manager at CERES was interviewed. The interview intended to answer the following guiding questions:

1. What is the format for pricing the CERES excursion programs?

2. How is funding distributed between staff and equipment, and how much value is associated with both?

3. How flexible is the pricing model; is there room for concessions or discounts?

The interview was set up as a semi-structured discussion, such that it was possible to pose a question about the pricing of the programs, and then follow up with further questioning based on the interviewees responses to the guiding questions. The responses identified how well the programs' pricing model adapted to the needs of visiting educators.

3.2.3 Cost Comparison of Competing Programs

The interview with the education manager at CERES revealed that their programs were chosen partially through comparison with competing programs of other educational organizations. By pricing their excursions relative to other programs, they remain competitive in the market of informal education excursion programs. In order to evaluate how cost of the CERES excursions compare to others, a cost comparison was performed with seven similar local programs.

Competing education programs were located through the Australian Department of Education website, which provides links to resources such as incursion and excursion programs and useful websites for schools for all year levels (DEECD, 2012). The education staff at CERES also recommended a few noteworthy programs in addition to those included on the department website. The seven programs chosen for comparison with CERES were: the Melbourne Museum, Melbourne Zoo, Royal Botanic Gardens, Collingwood Children's Farm, Edendale Farms, ScienceWorks, and Gould League. The excursion cost information was collected from the organizations' websites and through phone calls with the booking staff.

The chosen organizations used different pricing models for their excursions, based either on student counts, staff time, or fixed group rates. To allow the programs to be compared more easily, a standard excursion configuration was established, consisting of a full day excursion for thirty students, as each organization offered a full day program, and thirty students was the maximum group size supported by all excursions. The grade level of this hypothetical student group varied, as none of the chosen programs charged more for students of different age levels. Using the information available on the cost per activity, the number of activities per day, and the duration of each activity, the cost per student per hour of mentored time could be calculated for each excursion.

3.3 Developing Communication Tools

To more effectively support schools that visit CERES and promote better communication between the park staff and school teachers, we developed two forms of data collection: a program evaluation form for visiting teachers, and an improved teacher motivations survey, based on the lessons learned from the on-line survey.

3.3.1 Post-program Evaluations

A program evaluation form is a basic measure for measuring the performance of an excursion, such as those performed at CERES. Though evaluations are employed by CERES Incursions, the excursion programs have no such feedback. Program evaluations from the CERES incursion programs and CSIRO Education, Victoria were used as models to develop evaluations for CERES excursions. The form would be filled out on paper by teachers, after their excursion but before leaving the park, and would be immediately digitized into an online database.

We designed a form that is short, and should only take between one to three minutes to fill out. It contained less than fifteen fixed-answer questions and only a couple open-ended responses. The design was influenced by the American Association for Public Opinion Research's guidelines for how to produce a quality survey (AAPOR, 2012). The ranked questions were designed to quickly and easily capture teachers' base reactions after their excursions. The open response questions would catch any additional information the teachers wished to provide. The sample program evaluation and design guidelines can be found in Appendix E: Post Excursion Feedback Form.

3.3.2 Improved Teacher Motivations Survey

The limitations associated with the online survey that we sent out to teachers inspired the design of an improved survey tool to be used in the future by the staff at CERES.

Originally, we used open response questions that had teachers list their criteria for choosing informal excursion programs, then we coded the responses in an attempt to determine what was important to them. It would have been preferable to ask teachers to rank a set of predetermined criteria on a scale to remove response ambiguity. However, our analysis enabled us to draw conclusions about which criteria were the most important to teachers when choosing informal education programs, but we were unable to make any claims about the larger population due to the of responses we received.

While the old survey did not ask respondents for any information that could enable us to draw conclusions about the marketing effectiveness of CERES programs, such as the pamphlets, the ease of use of the website, if the program descriptions were accurate and useful, the guidelines for the new one has a section that is specifically designed to obtain this information. Other additions to the old survey include questions that shed light on, student engagement, program cost, competing programs, and the appropriateness of program cost.

3.4 Summary

Our sponsor expressed concern that the relatively unchanged educational programs offered by the park have not kept up with the evolving curricula of local Victorian educators, which now contains provisions for teaching sustainability. They required more information on the expectations of teachers booking excursions, so the programs could be designed accordingly. To better understand the situation, we conducted semi-structured interviews with teachers on-site, which informed the development of a large-scale internet survey. This information was compared with the knowledge and opinions of the CERES staff, to locate discrepancies between what teachers want and what CERES provides. From an analysis of these discrepancies, we formulated recommendations for areas of improvement that should be taken into consideration by the CERES staff members. Finally, data collection tools, including an improved teacher survey and program evaluations were developed to establish a channel of communication that allows teachers to communicate their excursion expectations.

4 Results and Analysis

An analysis of the data gathered by the methods described in the previous section, determined that the Victorian school teachers we interviewed use informal education to quantify curriculum material, and enhance learning and development. They also require informal education excursions to be relevant to the curriculum and engaging, but face economic and logistical barriers when booking excursions.

4.1 How Teachers choose Informal Education

To identify opportunities for improvement of the informal education programs at CERES, it was important to understand what the important criteria, or 'blocking factors', are that teachers must consider when choosing to go on an excursion. By understanding the requirements teachers have when booking, CERES excursions can cater to these needs and make the booking process easier. Results from the online survey and on-site interviews were analyzed to develop a list of criteria that teachers have visited CERES consider when booking excursions, as seen in figure 4.1.1. Among the teachers who visit CERES, in order of importance, *the criteria for selecting informal education excursions were curriculum relevance, program characteristics, economic factors, and excursion logistics.*

Figure 4.1.1: Teachers' Criteria for Choosing Informal Education. This chart illustrates the expression rate of teacher's criteria by year level of the students.

4.1.1 Curriculum Relevance

The deciding factor most commonly expressed by teachers was the degree to which informal education supported the curriculum, as seen in Figure 4.1.1. As most curricula specify both knowledge and developmental goals, this can be interpreted in two ways. An informal education excursion can be relevant to the curriculum by covering similar topics, providing more information or demonstrations, or it can be relevant by supporting the student developmental goals of the curriculum. Some respondents were more specific, and differentiated between relevance to topics or to student development, but most only mentioned "curriculum relevance" and were not specific as to how.

Of the teachers surveyed, 86% indicated curriculum relevance in the criteria they use for booking, 83% of which listed it as most important. Secondary schools listed this more frequently than primary schools, 94% compared to 84%. This reflects the more focused and directed nature of secondary education, in contrast with the more developmental goal of primary school. Of the teachers interviewed at the park, 82% expressed curriculum relevancy as the reason for their visit. The majority of respondents (83%) who have visited agreed that the CERES programs were accurately described by the promotional material, suggesting that they were successfully able to determine the relevancy of these programs when booking.

The interviews held on-site provided more information as to how programs can be relevant to the curriculum. Most teachers said that the programs and content at CERES demonstrates or reinforces items covered in the classroom. Others used the programs to cover topics in more detail and fill in knowledge gaps that may have been overlooked in the classroom. A few teachers mentioned that informal education allows for guided discovery or exploratory learning, where students are allowed to observe and learn in their own way, which supports the varying learning styles different students may have.

Other similar studies have found complementary results. A 2005 study of teachers visiting museums found that 90% of teachers chose to visit to relate to the curriculum (Kisiel, 2005). A 2011 study of Victoria area teachers by CSIRO Education, Victoria also found curriculum relevance as a major booking criteria (Carney, Hyman, Mello, & Snieckus, 2011).

4.1.2 Program Qualities

Many survey respondents indicated that program qualities were an important criteria for choosing informal education. Program qualities are related to the content and structure of the programs. Both on-site interviews and the internet survey revealed that teachers use informal education centers because of their provision of hands on activities, their ability to engage students, offer a wide variety of unique programs, and provide resources that were not available in schools. 62% of online survey respondents, and 80% of on-site interviewees cited program qualities as criteria for choosing informal education.

Most respondents listed "hands-on activities" in their criteria for choosing informal education or as the purpose of informal education. As hands-on experiences provide a number of educational benefits, it was difficult to interpret these responses. Hands-on activities can be used to provide self-guided discovery learning, to quantify classroom material with examples, or to enhance learning by engaging students. As respondents were not more specific, these were left generically classified as program qualities.

Several on site interviewees stated that they would prefer more hands on activities in the programs at CERES (16%). 40% of respondents that booked energy programs, such as sustainable building design, energy efficient housing, and water efficiency in the home, made specific requests for more hands on interactive activities. This can be attributed to the difficulty of providing hands-on activities on a broad and abstract topic such as energy (Millar, 2005). Despite their recommendations for more hands-on activities, none of the teachers interviewed on -site said that they were disappointed with the activities provided by CERES.

A number of survey respondents cited interesting, engaging, and fun activities as part of their criteria for selecting excursions. Excursions that successfully engage students will enhance their confidence, contain activities that allow them to physically interact with learning material, develop social, and teamwork skills (Zepke & Leach, 2010). One teacher noted that the best excursion should capture the imagination and attention of the students, while another said that excursions should be enjoyable and exciting.

Program variety were listed as important booking considerations by a several online survey respondents. Responses that fell under this category commonly stated that the variety of topics and age appropriateness of programs were important factors in choosing informal education programs.

The ability of an informal education center to provide resources that were not available in schools was noted by a few respondents. Responses from the resource category include examples of physical resources such as sustainable technologies, the cultural villages, as well as teaching resources like passionate educators. The resources provided by informal education increase the effectiveness of excursion programs by providing practical and immediate examples of what students are learning about.

4.1.3 Economic Factors (Price and Proximity)

Teachers' third largest concern when choosing informal education excursions was the associated financial cost. Price and proximity held more weight than other program logistics in the criteria from the teacher responses to the survey, therefore it garnered a criteria choice by itself. When specifying what criteria they considered when choosing informal education programs, teachers mentioned all of the following: price, cost, affordability, proximity, distance, access and convenience. One teacher mentioned that their school was looking for programs that were worth the monetary value that the school was spending on them. Classification of the responses yielded that there were two financial factors that were distinctly mentioned by teachers, price of the programs and proximity to the school. Economic factors such as price and proximity are significant in

the sense that they provide insight into the way that teachers associate a monetary value to learning material. Respondents unfortunately did not specify whether "cost" and "price" referred to travel or excursion price, therefore, it was assumed that the responses were associated with the excursion programs excluding the cost of transportation.

Of all teachers that responded to the survey, 40% listed economic factors such as price and proximity as criteria that they use for selecting excursion programs. As a separate function from proximity, price was expressed by 37% of all respondents, proximity on the other hand was only expressed by 20% of the total respondents. Of that 40% of responders, only 10% of them had listed either price or proximity as their top criteria for choosing excursions.
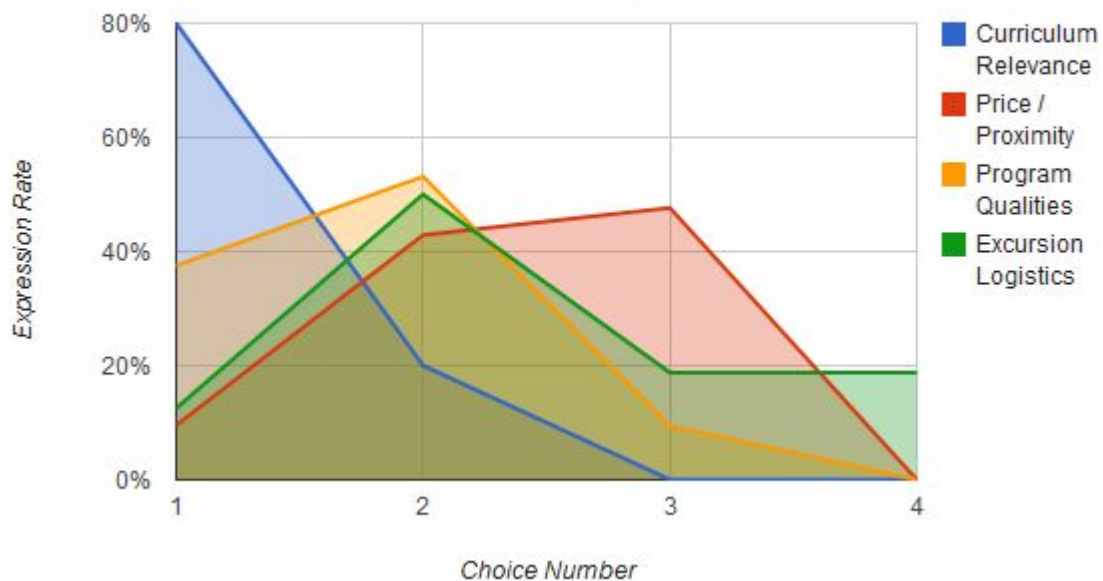

Figure 4.1.2: Selection Criteria listed by order of appearance. Curriculum relevance was listed first in most responses, while price, proximity, and program characteristic frequently were listed second or third.

Economic factors were frequently listed as the second or third most important criteria to teachers for selecting excursions, as seen in Figure 4.1.2.
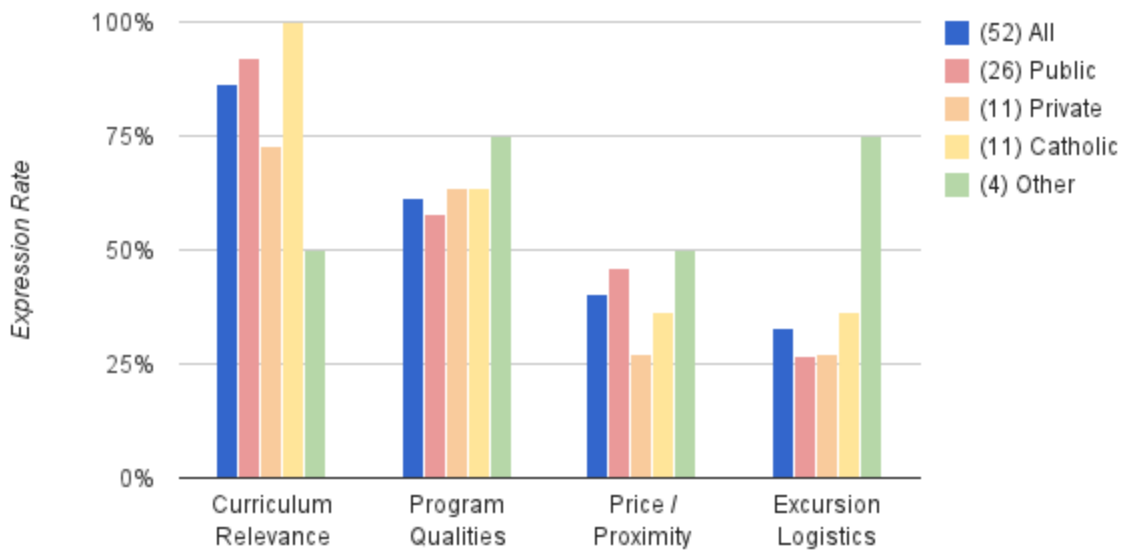
Figure 4.1.3: Booking Criteria by Institution Type.

The survey revealed that price and proximity were more of a concern for government schools than private or catholic schools. As shown in Figure 4.1.3, 46% of government schools, schools felt that economic factors were an important consideration when selecting excursions, compared to 36% of catholic schools, and 27% of private schools. A study conducted for CSIRO Education, Victoria in 2011 showed instead that catholic schools expressed a higher concern for price than either of government or independent schools. They looked deeper into the differences of opinion and focused on the budgets of government and independent schools in Victoria. The study found that the majority of the funding from government schools came from a combination of the state and local government, while independent schools funding was distributed primarily between parents and the Australian government (Carney et al., 2011). This study did not however account for private and catholic schools. Further information about where schools get their budgets for excursion programs can provide insight into whether or not discounts would be an effective avenue for attracting schools with constrained budgets.

School teachers from the North, South, West, and East metropolitan regions of Victoria expressed nearly the same concern for cost when choosing excursion programs. As shown in Figure 4.1.4, teachers from the East Metropolitan regions expressed the highest concern with a 45% expression rate, followed by the South metropolitan teachers with 40%, and then the North and West region which had a 33% expression rate. The difference was only marginal for the importance of price and proximity to schools from these regions. Another useful demographic in future studies would be the amount of time that it takes for schools to travel to CERES. This information provides for a further analysis of the effects of proximity in choosing excursion programs.

Booking Criteria by Region
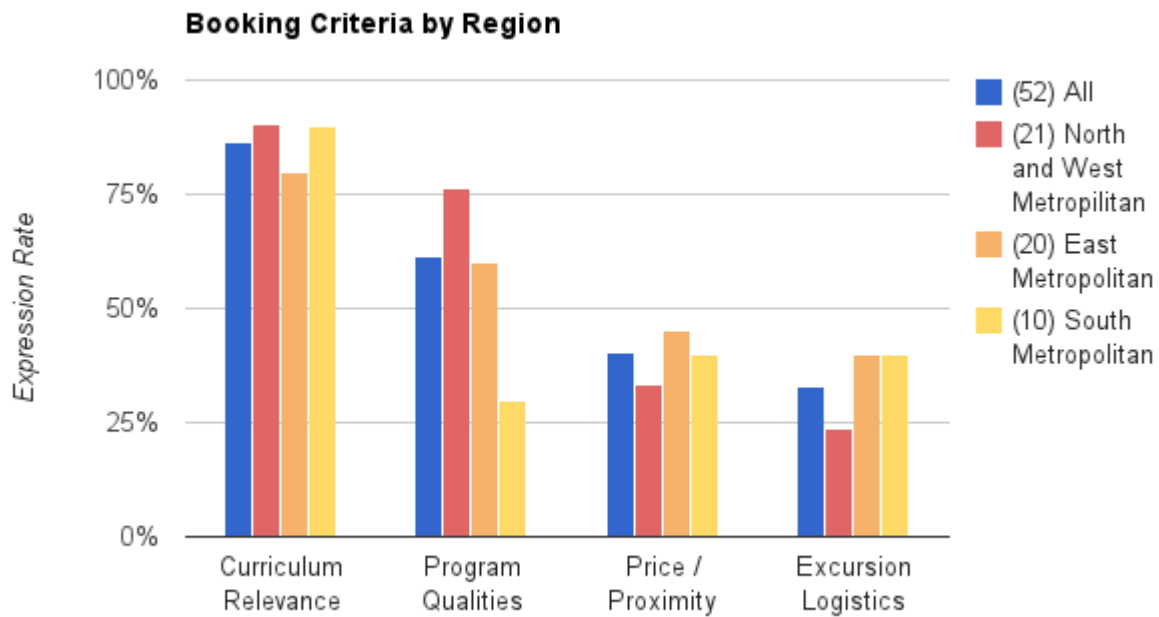
Figure 4.1.4: This chart compares excursion booking criteria by the school's region. As it only contains data from the metropolitan areas, the importance of price and proximity are relatively even. The singular response from Gippsland was omitted from this chart.

Regional schools were not included in the chart of Booking Criteria by Region because of there was only a singular response outside of the Metropolitan areas. The suggestions offered by schools in both the interviews and the online survey provided interesting insight into what were some of the barriers for coming on a visit to CERES. A teacher made note of the expensive cost associated with hiring two buses to caravan the students to the park. Another teacher recommended that CERES make it easier for regional schools to come to the park, so that his school could come back to the park more than once per year. After analyzing the feedback for program improvements that were suggested in both on site interviews and the online survey, it became apparent that regional schools were the ones voicing their opinions for how proximity puts them at a learning disadvantage.

The difference in criteria was also explored between schools of differing age levels. Primary schools placed a greater emphasis on economic criteria in choosing informal education programs than either secondary or tertiary schools by a sizable amount. Shown in Figure 4.1.1, 54% of primary school respondents listed price and proximity as important criteria, compared to 25% of secondary, tertiary and higher education schools when choosing informal excursion programs. These numbers suggest that higher education schools feel that informal education programs are a more worthwhile expense than primary schools, and therefore are not as worried about the cost associated with the going on them.

Teachers were given on the surveys and interviews the chance to provide suggestions for improvements to the excursion programs at CERES, and several of them addressed the needs of their schools in regards to the affordability of the programs. For example, one teacher expressed their concern with the fact that their school had been charged for more students than they had brought to the park, because the school itself was small in size and independent. This educator felt that CERES should have better catered to the needs of their school by accommodating the cost with the size of their class, rather than holding them to a minimum excursion price, which is in place to guarantee a profit margin.

4.1.4 Excursion Logistics

Many teachers expressed concern regarding the more logistical aspects of an excursion. Excluding price and proximity, this category concerns the facilities, schedules, and accommodations that accompany an excursion. Though none of these responses were particularly prevalent, they included:

- Program availability and schedule

- Maximum group size supported

- Accommodations for special needs, including religious requirements and disabilities

- Facilities, including places to eat and play, and for storing personal belongings

- Considerations for inclement weather or other unforeseen events

Of the teachers surveyed, 32% listed logistical concerns as some of their criteria for booking and it most frequently appeared second or third in their rankings.

4.2 Why Teachers use Informal Education

To gain a better understanding of the purpose and expectations of informal education, we also asked teachers how they might use informal education excursions to supplement the formal education that takes place in the classroom. This information helped us analyze the programs and their design processes. The majority of teachers mentioned "hands-on experience" as the most important aspect of informal education, but this can be interpreted in several ways, described below in more detail.

4.2.1 Quantifying Classroom Material

Many teachers used informal education to provide concrete examples and demonstrations of the topics they discuss in the classroom. By supplementing classroom theory with practical applications, students would gain a better understanding of the material, by becoming engaged and interested in the topics and retaining information more easily.

Perform activities that demonstrate classroom topics

An informal education experience that demonstrates the topics taught in the classroom helps to solidify these concepts more thoroughly, by providing concrete examples and allowing for exploratory learning that caters to different learning styles. Demonstrating topics is one way that hands-on experiences can be used to supplement classroom material. 60% of teachers surveyed mentioned "demonstrating classroom topics" as part of the purpose of informal education. Additionally, 65% of teachers interviewed noted that CERES provides examples that quantifies classroom material.

Provide access to resources unavailable in the classroom

While classrooms and schools are excellent venues for general learning and education, they often lack the detailed level of knowledge that is accessible through excursions to places that specialize in those topics. Places like CERES offer access to expert opinions, locations, and equipment that may be difficult or impossible to bring inside the classroom. In these instances, it is easier and more effective to bring the students on an excursion, rather than bring items into the classroom. 56% of teachers surveyed mentioned access to resources, locations, or experts as the purpose of informal education. Additionally, in an informal interview with the director of the CERES incursion programs, one of the most popular incursion program involved bringing a trailer full of solar panels, water filters, and other sustainable equipment to the school for demonstrations Appendix C: Incursion Program Audit.

4.2.2 Enhancing Learning and Development

Many online survey respondents listed enhanced student learning and development as their rationale for utilizing informal education. By combining a unique learning environment and teaching style that students are not used to, informal education builds confidence, improves learning, and enhances social skills (Haury & Rillero, 1992). 19% of survey respondents listed learning in a different environment and catering to different learning styles as rationale for utilizing informal education programs.

Learning in a Different Environment

Of the respondents surveyed, 20% cited that the ability for informal education to provide a different learning environment was an important consideration for them when deciding to use informal education. One of our respondents noted that students were more enthusiastic during excursions, and that bringing students into a unique environment seemed to encourage learning. Another teacher said that informal education programs could offer enhanced student engagement in cultural studies by providing authentic settings, such as an Indonesian village, in which students could directly interact with the culture, improving their understanding and building a stronger connection with the material.

Self-Guided Discovery Learning

Several survey respondents (18%) noted that informal education can be used to for exploratory, or self-guided learning. This style of learning allows the student to explore within the confines of the task and content, and allows them to formulate their own conclusions, which can be much more powerful than being taught by someone else on the topic (Alfieri et al., 2011).

4.3 CERES Program Design

Interviews were held with each of the CERES excursion program designers to determine how the content of the programs was selected, and how well they worked to engage students. To learn more about the pricing model of the excursions, an additional interview was conducted with the CERES education manager.

4.3.1 Curriculum Relevance

Through interviews with the CERES educators responsible for the development and presentation of the educational programs, we found that the curricula of Victoria and local schools are not considered when designing programs. Programs are designed by identifying topics of interest that are not already covered by the existing programs, or that the staff feel should be covered in more depth. Through personal research and discussion, these gaps are identified, and information is gathered about them through various channels, including internet articles, library research, and personal opinions. The park also subscribes to a registry of environmental and sustainability grants, to which they propose educational programs to satisfy relevant grants. The park designs programs through their own research and with their own agendas, and as one educator explained specifically, *any connection with the local curricula seems to be out of pure coincidence.*

Once a topic is selected, the educators evaluate the information available on the topic and determine the "key messages" that will be used to design the program and activities. The programs are designed using hands-on activities as the most important feature, rather than observatory lectures, and the information covered by the program reflects this. Topics that are too difficult to make engaging, or those that are too informational may be omitted entirely. Programs for younger students tend to include game-like activities. Again, though the standard curricula, such as the VELS or National Curriculum, provide guidance and objectives for program design for sustainability and other topics, these are not referenced when designing programs. *The educators at CERES have an opportunity to increase the relevance of their educational programs and ease the process of program design by referencing available local or national curricula.*

4.3.2 Engagement

CERES programs are designed to be as engaging as possible by having students physically interact with learning material as quickly as possible and by having educators present material in an interesting and dynamic way. Teachers viewed engagement as having students interact the classroom material. During the interviews with the CERES educators they all independently stated that in order to get students involved with the material they having them participate in hands on activities during the excursions. Also, they avoid worksheets and always try to get as much physical interaction with the learning material in as possible. *CERES connects students with the material by presenting it in a positive and intriguing way to promote understanding and raise student engagement.*

The educational programs at CERES are revised to improve engagement when the educators notice that students are not paying attention. An example of this is when an old fossil fuels program was revised when educators noticed that the was program scaring students by describing how humans permanently damaged the environment. The revised program now presents fossil fuels in a more positive light by portraying them as a stepping stone for technology, and teaching students that humanity needs to find and adopt alternative energy sources. Additionally CERES' energy program coordinator, noted that he had been working on creating better hands on activities for the energy programs due to a noticeable lack of engagement from the students. *CERES will successfully engage students if they continue to observe student reactions to presented material and refine programs as necessary to ensure student engagement.*

4.3.3 Price and Proximity

Price was one of the most common factors that teachers mentioned that they take into consideration when choosing informal education programs, therefore the pricing of the programs was investigated by interviewing the education manager at CERES. The interview revealed that the programs were designed based on three concepts, precedent, competitiveness, and the profit margin per student. The profit margin is guaranteed to be met at CERES by charging schools for a minimum number of students per excursion. The competitiveness aspect is maintained by researching into the cost and offerings for other excursion programs with similar offerings. It was determined from the interview with the education manager that there are no discount offerings or promotions available for schools with limitations associated with travel or school budget. The suggestions offered from regional school teachers expressed a strong desire to come to the park because they valued what the programs had to offer their students, but they also mentioned that were not able to come to the park more than once per year because of budget constraints and difficulty with travel. In fact, one teacher specifically mentioned that due to the schools funding they were only able to come once per year, but they would prefer to come more than that. *Schools limitations are not taken into account into the pricing design of the excursions at CERES, because the pricing is only dependent on the three criteria addressed above.*

In order to further investigate the competitiveness of the CERES excursion programs, and identify how much of an issue cost is for teachers choosing informal education programs, a cost comparison was done for seven similar programs in the Melbourne area.

4.4 Cost Comparison of Excursion Programs

Location	Cost per Student	Staff Time (hour: min)	Cost / Mentored Hour
Collingwood Children's Farm	$12	4:00	$3.00 per hour
Edendale Farms	$14	3:45	$3.73 per hour
Melbourne Museum	$14 to $18	2:00	$8.00 per hour
ScienceWorks	$14 to $18	2:00 to 4:00	$5.33 per hour
Melbourne Zoo	$17	1:30	$11.33 per hour
CERES	*$18*	*3:20*	*$5.40 per hour*
Gould League	$20	3:20	$6.00 per hour
Royal Botanic Gardens	$21	3:30	$6.00 per hour

Table 4.1: A comparison of cost and time spent with excursion staff for a group of 30 students at eight similar excursion providers.

The Melbourne Zoo offered a couple short educational programs, while the rest of the day would be unguided exploring. The Royal Botanic Gardens offered morning and afternoon sessions, each one hour and forty-five minutes long. Edendale Farms offers excursion programs that are very similar to the offerings at CERES. The affordable price and large amount of time with staff makes Edendale one of the more competitive programs. The Melbourne Museum offers four guided gallery tours in a day, each an hour long, evenly divided between lecture and exploring. The ScienceWorks similarly offers four hour-long programs consisting of activities and exploration. The Collingwood Children's Farm offers two-hour morning and afternoon sessions and offers the most staff-time for the price. A full day excursion at CERES consists of four activities, each fifty minutes long, all of which are staff-led. **This comparison suggests that excursion customers are not leaving CERES to attend cheaper programs.**

5 Conclusions and Recommendations

This chapter begins with a summary of our findings from the on-site interviews and on-line survey, which helped us to establish the needs of teachers who visit CERES. From these findings, we looked at the design of the CERES programs to see how well they met these needs. From this comparison, we formulated recommendations for immediate changes, as well as additional venues of analysis.

5.1 Summary of Findings

The information collected from our surveys and interviews yielded findings that helped us formulate recommendations, a summary of which is provided below:

When booking informal education excursions teachers who visit CERES consider curriculum relevance, program content and qualities, price and proximity, and excursion logistics to be important factors. Teachers indicated that an informal education excursion should be relevant or related to the curriculum, including the curriculum topics and developmental goals. Most also indicated that they were following standard national curricula, including the VELS, Australian National Curriculum or the AusVELS. Programs content and qualities, including educational depth, student engagement, and available resources, were also listed. Many teachers considered economic factors like price and proximity, as well as excursion logistics such as storage and weather considerations.

Teachers use excursions to quantify classroom topics with practical examples and enhance students' learning skills and development. Respondents to both the online survey and the on site interview noted that they use informal education excursions to supplement classroom material. They listed hands on activities, engaging students, providing resources, and learning in a different environment, as reasoning for utilizing informal education programs. Additionally teachers responded that they use excursions to provide real world examples of classroom, involve students in activities that engage them with learning material, and accelerate learning by immersing them in different learning environments.

The price of the programs at CERES is not an underlying cause of customers choosing other excursion opportunities. From cost comparison of excursion providers with similar program offerings, CERES excursions were not found to be excessively expensive or cheap, although they were one of the more competitive programs with the amount of time they offered with staff for a full day excursion. Some of the programs compared however provided more time for self guided learning, in stead of the time with the program staff. This cost comparison looked at the most time that a school could get with an excursion staff member over a full day trip, which assumes that teachers prefer guided learning to unguided. The drop in number of customers booking excursion programs each year is not a result of the programs being more expensive than other like providers. Further research should be done to identify how teachers comparatively value learning with a staff member versus learning through self guided experience.

Hands on activities that engage students is the most defining attribute that CERES excursions offer schools. All of the program designers mentioned that providing hands on activities was one of their design priorities and was the most effective way of keeping students involved while also encouraging participation. Teachers verified that CERES designers were successful in designing their programs to be hands on in the online survey, where respondents commonly stated that "hands on" or engaging activities, distinguished CERES from other informal education programs. Also, teachers frequently mentioned hands-on activities as one of their booking criteria, and their desire for hands on activities was common and constant across school types and levels.

5.2 Recommendations

From the information gathered over the course of the project, we are able to offer recommendations relating to the design of the education programs, the organization and structure of the programs, and offer some insight into additional areas of analysis that this project was not able to complete.

5.2.1 Program Modifications

Reference national and local curricula when developing educational programs. Teachers select programs that are easy to integrate and relevant to their curriculum unit. CERES Education can ensure their programs fit well within the curriculum by referencing curricular standards such as the VELS, Australian National Curriculum, or AusVELS when deciding what topics to cover, and how to cover them. This may alleviate some of the difficulty of designing programs by providing suggestions for the types of activities and content to provide. Additionally, referencing these well-developed standards will provide better organization and guidance for the programs in the future.

Continue to design, monitor, and refine programs to make them as engaging and hands on as possible. According to our online survey analysis, teachers search for programs that are engaging and have many hands on activities when booking excursions. The on-site interviews revealed that a few energy programs were not satisfying teachers by engaging students enough. However, CERES educators had already noticed the lack of engagement before we did, and had already been working to revise the program. We found that teachers desires for hands on and engaging activities were satisfied by all of the other CERES excursion programs.

Maintain the pricing scheme for excursions at the park, but look into the feasibility of partnerships with transportation companies. In the past, teacher feedback was never taken into account when pricing the excursion programs because it had never been previously collected and analyzed. Regional schools in particular expressed a large desire for going on excursions at CERES, but that they were incapable of doing so because of budget limitations and complications with travel arrangements. The pricing of the excursion programs at CERES is only based on comparison and precedent, and therefore does not take into consideration schools that may be at a

financial disadvantage due to school demographics. Several of the teachers interviewed established that if the excursion programs are willing to meet their needs by lowering the prices, then they would be willing to come to the park more frequently. CERES should consider forming a partnership with school transportation providers, which would address both transportation and program cost that these teachers addressed as being their needs.

5.2.2 Additional Venues of Analysis

The time, manpower, and available information limited the scope of the project considerably, and though we were able to identify some important venues of analysis based on the survey and interview data, we were unable to pursue every lead to its conclusion. These recommendations are suggestions for future projects that could yield beneficial results.

Analyze and evaluate trends in the information already available. The information available from booking records can provide insight into popular and unpopular programs, trends between school regions and sectors, and pricing information. The switch to a new database system promised this information, but has yet to deliver. Were development to continue on this system and the data migrated from the previous booking database, a useful analysis of these trends could be created, and would help plot future changes in the education programs, and may motivate an extensive audit of the excursion programs.

Perform an analysis of the finances. Teachers prominently expressed price as a major consideration when choosing informal education. This project begun that analysis by comparing the cost of a CERES excursion to similar excursions, but there are many other areas to address. In order to address the needs of teachers that book excursions at CERES, it is recommended that another project looks into the profit margins and price of the CERES excursions, explores schools' budgets for excursion programs, as well as the opportunities available for incentives and promotions for the education programs.

Evaluate and audit the marketing of the excursion programs. The successful development of excursion programs and subsequent integration within school curricula requires communicating excursion topics and details, and collecting teacher expectations. This project focused on the latter, teacher feedback, but has not looked at the material CERES uses to provide program information. An additional project could analyze how these programs are marketed, and the how difficult it is for teachers to integrate them with their curricula. Another might include looking into the travel of information, and evaluate how CERES staff could get their programs out to a wider population.

5.3 Final Conclusions

Over the course of the project, we discovered just how critical teacher feedback is to the development and evolution of informal excursion programs. Without this important line of communication, by which teachers may articulate their expectations, the CERES staff could not understand how well their programs met teachers' needs, or how they could improve. In our short time at the park, we collected valuable information from teachers that allowed us to identify some important discrepancies and provide a few concrete recommendations, which are listed below.

Aside from these specific recommendations, this project is evidence of the importance of gathering feedback from teachers. However, our data gathering techniques were not without limitations, and if revised, have the potential to offer even more useful information. Therefore, *CERES should continue to pursue communication opportunities that allow them to understand their customer base more completely.* We have suggested two options that help to establish this line of communication, a program evaluation form and an additional survey, which we hope CERES will develop and implement, along with other lines of communication beyond our suggestions.

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Appendix A: Interview Questions for Visiting Teachers

Logistics

- Institution Name

- Student Year Level

- Excursion Name

- Starting Location

- Date and Time

- Interviewer

- CERES Staff Present

Opening Statement from CERES Staff Member

These students are from WPI, which is a university in the Boston area in the United States. They are trying to help CERES become more relevant to the needs of teachers. They would like to briefly speak with any educators willing. Are there any teachers that would be willing?

Opening Statement to Teachers from Interviewer

This interview will be anonymous, and the responses will be used in the project that we are doing for CERES. CERES wants to hear all feedback, good and bad, because they are very serious about improving their programs, so please don't feel pressured to respond a certain way.

Preliminary Questions

1. Is this your first time visiting CERES?

    a. If not, why did you decide to visit?

    b. If so, why did you decide to return?

2. Did you book the excursion?

    a. If so, did you have a clear idea of what you wanted from the website, brochure or program list?

Questions for Teachers

1. What curriculum are you using? (VELS, Australian, AusVels)

2. What is the unit of study that this excursion is being used in?

3. What are the goals of the unit?

4. How are you using this excursion to support these goals?

5. Are you using this excursion to introduce, supplement, or conclude the unit?

6. What have you done in the classroom to prepare for this excursion, and how do you plan on following up with it?

7. What does CERES provide that the classroom cannot?

8. Aside from its educational programs, CERES provides a unique perspective on sustainability. How does this affect the development of your students?

9. Did this excursion meet your expectations? How did it satisfy them or where did it fall short?

10. Do you have any other suggestions or criticism that could help CERES improve their programs?

Concluding Questions

1. Is there anyone that you could suggest who could help us better understand the needs of your school?

2. If we have any follow up questions could we contact you via email or phone?

Appendix B: On-line Survey of Informal Education

E-mail Survey Request

Subject: Save 5% off your next CERES excursion - Help us by completing this short survey

Body: The CERES Community environment park needs your help to shape the future of their education programmes. By better understanding the needs of educators, CERES can make their programmes more relevant and useful to what is going on in the classroom. We are a team of students from Worcester Polytechnic Institute located in Massachusetts, USA, working with the educators at CERES to help them gather data from schools and teachers who have been in contact with the park in the past.

We have prepared a short (5-10 minutes) survey that would help CERES achieve this goal. Completion of this survey will give you a 5% discount on your next CERES excursion, valid up to one year after submitting your responses.

The survey can be found at: [URL of online survey]

Participation in this survey is strictly voluntary, and all responses will be kept confidential. The survey asks for the name of the institution, which will be used to keep track of discount eligibility. Your email address was obtained from a list of schools that have previously booked or expressed interest in booking an excursion with CERES.

If you have any questions or comments about the survey, please direct them to <>.

Thank you for your time.

CERES Teacher Motivations Survey

Thank you for taking the time to fill out this survey. This survey is being conducted by students from the Worcester Polytechnic Institute, in Massachusetts, USA, for the CERES Community Environment Park, located in East Brunswick, Victoria. Your feedback will help CERES better align their educational offerings with the needs of local educators.

This survey should take between 5 to 10 minutes to complete. Your responses are completely anonymous and confidential. Completing this survey will give you a 5% discount on your next CERES Excursion, which is valid for one year after completion of the survey.

Questions marked with an asterisk (*) are required. After completing a page of questions, click 'Continue' at the bottom of the page to move on.

Demographic Information

This information will help us plot trends and avoid bias.

- What is the name of your institution? This is required to redeem your 5% discount.

- How would you classify the institution?*

    ○ Government (Public)

    ○ Private

    ○ Catholic

    ○ Other: _____

- What year level do you teach?* If more than one, choose the level that most frequently participates in informal education excursions.

    ○ Prep

    ○ 1 .. [entries 2 through 12 omitted for brevity]

    ○ Tertiary

    ○ Adult

    ○ Other

- In what region is the school located?*

    ○ East Metropolitan

    ○ North and West Metropolitan

    ○ South Metropolitan

    ○ Barwon-South Western

    ○ Gippsland

    ○ Grampians

    ○ Hume

    ○ Loddon Mallee

    ○ Other

- What is your teaching role?*

    ○ Classroom Teacher

- ○ Sustainability Coordinator

- ○ Administrator

- ○ Other: _____

- What subjects do you teach?* [Select multiple]

    - ○ Science

    - ○ History

    - ○ Mathematics

    - ○ English

    - ○ Humanities

    - ○ Other: _____

- Has your school visited CERES before?*

    - ○ Yes

    - ○ No

- Does your school plan on visiting CERES in the future?*

    - ○ Yes

    - ○ No

Previous CERES Experience

[If the respondent indicated that they had not visited CERES before, this section was skipped]

- Having visited CERES before, please rate the following statements according to how strongly you agree or disagree with them:* [Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree]

    - ○ The CERES programs were accurately described by the promotional material (web site, brochure, etc.).

    - ○ The CERES programs satisfied my teaching expectations.

    - ○ The CERES programs and activities are important for student development.

    - ○ The alternative perspective provided by the CERES park is important for student development.

- How does a CERES excursion differ from other forms of informal education?

- Do you have any suggestions for how CERES can improve to better meet your needs? Comments and criticism on any aspect of CERES is appreciated.

Informal Education and CERES

- What are the criteria you use when choosing an informal education excursion?* In order of most to least important.

- In your opinion, what is the purpose of informal education?*

- What does an informal education excursion provide that cannot be accomplished in the classroom?*

Appendix C: Incursion Program Audit

In 2008, Kirstie Costa, a CERES employee who works with the sustainable schools initiative and incursion programs at CERES, performed an exploratory audit in response to declining incursion bookings. This audit made use of a study that identified teachers motivations for informal education programs performed at CSIRO education in 2011. Ten years of incursion program bookings were researched in order to determine what programs were being booked and with what frequency. The data were then analyzed for trends to find out which programs were increasing or decreasing in popularity. A report outlining teachers motivations for Two options were decided upon for programs that were low in popularity. The programs could either be remarketed to appeal to bookings teachers, or erased entirely from the incursion program offerings. One aspect of the remarketing avenue of analysis, involved evaluating the naming and descriptions of the incursion programs to determine if teachers were misinterpreting what the programs offered because of an inaccurate program marketing.

The audit lead to a reduction in the number of incursion program offerings at CERES, revamped program descriptions and program names, the adoption of an online survey to gather teacher response to incursion programs, and the utilization of social media to keep people updated on CERES. These changes resulted the formation of stronger relationships between CERES staff and teachers, an easier booking experience for teachers, a streamlining of programs through the adoption of a standardized teaching model, and an increase in the number of bookings.

Appendix D: Improved Survey of Teachers Needs

[How to design a good survey for this purpose, and what to include]

Demographic Information

This information will help us plot trends and avoid bias.

- What is the name of your institution? This is required to redeem your 5% discount.

- How would you classify the institution?*
    - Government (Public)
    - Private
    - Catholic
    - Other: _____

- What year level do you teach?* If more than one, choose the level that most frequently participates in informal education excursions.
    - Prep
    - 1 .. [entries 2 through 12 omitted for brevity]
    - Tertiary
    - Adult
    - Other

- In what region is the school located?*
    - East Metropolitan
    - North and West Metropolitan
    - South Metropolitan
    - Barwon-South Western
    - Gippsland
    - Grampians
    - Hume
    - Loddon Mallee

- ○ Other

- What is your teaching role?*

    - ○ Classroom Teacher

    - ○ Sustainability Coordinator

    - ○ Administrator

    - ○ Other: _____

- Has your school visited CERES before?*

    - ○ Yes

    - ○ No

- Does your school plan on visiting CERES in the future?*

    - ○ Yes

    - ○ No

- How much time does it take for your school to get to CERES?

- How did you hear about CERES excursion programs?

- What is the schools budget for excursion programs?

Competing Programs

- What are some other educational excursions you use?

- What appeals to you about these programs?

Previous CERES Experience

[If the respondent indicated that they had not visited CERES before, this section was skipped]

- Having visited CERES before, please rate the following statements according to how strongly you agree or disagree with them:* [Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree]

    - ○ The CERES programs were accurately described by the promotional material (web site, brochure, etc.).

    - ○ The CERES programs satisfied my teaching expectations.

    - ○ The CERES programs and activities are important for student development.

- ○ The alternative perspective provided by the CERES park is important for student development.

- ○ The programs were engaging for students.

- ○ Program cost was appropriate.

- How does a CERES excursion differ from other forms of informal education?

- Do you have any suggestions for how CERES can improve to better meet your needs? Comments and criticism on any aspect of CERES is appreciated.

Informal Education and CERES

- What does an informal education excursion provide that cannot be accomplished in the classroom?*

- From the criteria that this report determined were of importance to teachers, ask teachers to rank their importance, rather than leaving the question open-ended. Randomize the order of criteria if possible to avoid introducing biases.

- ○ We chose to use open-ended questions because we did not have a clear idea of what criteria teachers used when choosing informal education programs. Because of this, we could not actually determine how important the criteria were, except whether or not they were expressed. We asked them to order the criteria from most to least important, but this was more difficult to analyze for the importance than just rating items in a list from 1 to 5. The suggested criteria are:

  - ■ Relevance to curriculum topics

  - ■ Relevance to student development

  - ■ Price

  - ■ Proximity

  - ■ Access to resources (equipment, locations, or experts)

- ○ Asking numerical or fixed-answer questions makes the data easy to summarize compared to open-ended questions.

What means of travel did your school use to get to CERES?

- Budgeting and Pricing and Program Value Information

  - ○ Ask teachers about their budget for field trips?

    - ■ Where does the money come from for field trips?

- How many field trips does the year level partake in per term or per year?

- How many programs would you prefer to go on per year if price were not an issue?

   ○ What other options do teachers have for programs for excursions?

   - Why was CERES chosen instead of these programs?

- How valuable is learning with excursion staff members versus unguided discovery learning (consider the example of the Melb. Zoo or museum style learning, then reconsider how valuable this is at CERES)?

- Ask teachers how much time it takes their schools to get to CERES

- For a 50 minute excursion at CERES, how much time would you prefer was devoted to "hands on" learning versus being more formally educated by a member of the staff.

- Define what "hands on" learning means

- Do you have any suggestions for how CERES can better meet your needs?

Marketing Based Questions

1. Have you ever heard of CERES before?

   a. How did you hear about it?

2. How many other informal education programs did you consider before choosing CERES?

   a. Why did you choose CERES amongst other programs?

3. What kinds of things prevent you from booking an informal education program?

4. What different kinds of education programs do you use outside of the school?

   a. what is so appealing about these programs?

5. What is the most appealing aspect of an excursion to CERES?

6. How well does CERES meet the Criteria for informal education programs?

7. What would you do without these programs?

8. What are the challenges that CERES faces to increase school participation in programs?

9. What are the opportunities CERES has to increase school participation in programs?

10. What goes on in a conversation with the booking agents at CERES?

11. What underlying factors influence a teacher's decision to book?

12. What prevents you from booking more excursion programs yearly?

13. Satisfaction with booking of CERES Programs (rank)

14. Using all the factors you consider when booking programs, give each individual factor a rating between 1-10 on how important they are, 1 being unimportant and 10 being very important.

15. What time during the term do you typically go on the excursions?

Appendix E: Post Excursion Feedback Form

The post-program feedback information used by a similar project for CSIRO Education, Victoria, and another survey utilized by CERES incursions program, provided immense insight into the efficacy of the programs and the satisfaction of visiting teachers. Similar data collected at CERES could help future analyses and audits of the the education department. These are some recommendations for the development and use of a post-excursion feedback form:

- The form should be short and simple, to encourage a high return rate. The target time for completion of these forms should be between one and three minutes.

- The use of non-open-ended questions will facilitate speed and make summarizing responses easier when collected

- A single open-ended question about general feedback will catch miscellaneous things the other questions may have missed, should be placed at the end.

- The forms should be offered to teachers physically, but digitized into a spreadsheet analysis program, i.e., Google Docs. This will save time and trivialize the analysis of responses.

- Logistical Info provides feedback that is specific to the teacher leading the programs. Criticism for the CERES educators giving the programs, as well as specific input into the program qualities.

Logistical Information

Teacher's Name (Optional), Year Level (Circle), Programs, Educators

Ranking Questions

Having teachers rate statements on a scale of one (that they strongly disagree) to five (that they strongly agree), by checking boxes will further aid in the ease of inputting surveys into a computer program, as well as make it easy for the teachers to fill out. Suggested statements include the following:

The material presented was relevant to the course of study

- This can help CERES determine how their programs are being used and if they are covering the right topics.

- Teachers that say no, and have a high level of satisfaction, are probably visiting CERES to give students a break from class.

- Teachers that say no, and have a low level of satisfaction, probably expected CERES to cover topics that they did not (further evidence to support this potential conclusion is given in a later question)

The program is likely to have an impact on the students

- CERES can gain insight into how effective they are at motivating students to adopt more sustainable practices.

The program materials were appropriate for this age group, the program was engaging, educational, and cost was appropriate

- This question can help determine if teachers are satisfied with the material that the programs are covering, also if they consider the programs to be engaging, educational, or if teachers considered the program cost to be appropriate.

The program was easy to book

- Responses to this question will shed light on how well the booking staff, or online booking system were are able to help teachers.

I would book this program again:

- This question is an important measure of the success of the excursion program, and will determine whether or not CERES provided a program that satisfied teacher's needs, and if they will be returning.

- Responses that indicate teachers will not be returning have to be taken seriously and should be reviewed by the staff at CERES carefully to determine the problem and try to find a solution.

Open ended question:

Other suggestions/comments

- This question should be at the end of the survey so that the preceding ranking questions can prompt a further response on areas that teachers felt strongly about.

- Leaving one open ended response can catch the other responses that teachers felt strongly about or cared to elaborate on.

Other questions can be added as necessary, but the design goal of this survey is ease of use.

Sample CERES Excursion Evaluation Form:

Teacher's Name (Optional):_____

Email (Optional):_____

Year Level of Students (Please Circle) 1 2 3 4 6 7 8 9 10 11 12 Tertiary Adult

Date:_____

Programs:_____
_____

CERES
Educator(s):_____
____

Please rank the following statements:

	Strongly Agree	Agree	Neither Disagree or Agree	Disagree	Strongly Disagree
The material presented was relevant to the course of study					
The program materials were appropriate for this age group					
The program was engaging					
The program was educational					
Program cost was appropriate					
The program was easy to book (booking teacher only)					

The program is likely to have a positive effect on the students					
I would book this program again					

Other suggestions or comments: