

DESIGNING AN EVALUATION SYSTEM FOR THE
WALKING MOUNTAINS SCIENCE CENTER COMMUNITY PROGRAMS

By

Nicole R. Muench

A practicum submitted
in partial fulfillment of the requirements
for the degree of
Master of Science
(Natural Resources and Environment)
at the University of Michigan
April 2016

Faculty Advisors

Professor Michaela Zint, Chair
Associate Professor Gail Luera

Abstract

There are a growing number of environmental education programs for pre-school aged children across the country. This project's goal was to develop and pilot test an evaluation system for the Walking Mountains Science Center (WMSC) to assess its early childhood programs' outcomes and inform program improvements. Two questionnaires were created and pilot tested as part of the development of the evaluation system (total N=189). One questionnaire was administered immediately following each program (post program; Earth Keepers n=82, Nature Tykes n=8, Scenic Storytime n=2) and one was emailed to families one month later (program retention; Earth Keepers n=6, Nature Tykes n=1, Scenic Storytime n=0). Families within the Earth Keepers program were emailed the program retention questionnaire a second time in an attempt to gather more responses for analysis (n=6, total program retention n=12).

Favorable post program questionnaire responses suggests families who participated in the three programs intended to participate again, planned to recommend the program to others, and suggested that children enjoyed and engaged with the program's topics, vocabulary, and activities. Post program and program retention responses regarding children's experience and outcomes provide evidence to suggest that WMSC is meeting some of its desired children outcome goals, with room for improvement (mean scores were mostly about 4, with 1=strongly disagree to 5=strongly agree). In some contrast, quantitative self-reports and qualitative comparisons of the Earth Keeper families' responses immediately after and one to six months after the program suggest that families' high stewardship intentions did not translate into behaviors.

Because WMSC is interested in behavioral changes as a result of their programs, they will need to investigate how to enhance participation in retention questionnaires to be able to answer related questions. Recommendations were made to improve the evaluation system, including changing the language on open-ended questions to prompt legible responses, conducting a needs assessment for underrepresented audiences, and highlighting program alignment with Colorado State Standards for Preschool and NAAEE Early Childhood Environmental Education Guidelines. In addition to pilot testing post program and program retention questionnaires, this practicum included the development of an evaluation plan for WMSC to allow staff to collect and analyze program evaluation data on an on-going basis.

Acknowledgements

I would first like to thank Dr. Michaela Zint for her guidance to literature and resources, questionnaire development insights, and many hours of support and feedback. Thank you to Dr. Gail Luera, who agreed to sign onto my practicum while on sabbatical. Thank you to Jennifer Carman and Benjamin Morse who worked with me during countless hours of Stata instruction, practice, and work sessions, and who offered constructive feedback and analysis suggestions throughout this entire project.

Lara Carlson was an amazing, flexible, fun and easily reachable client to work with. She helped coordinate all the logistics of me being on site, and meeting and working with the Walking Mountains Staff. She offered valuable insights on the development of this practicum as we narrowed down the focus to early childhood programs, and connected me with various members of the staff who also offered insights and suggestions for the practicum's development.

Kaitlyn Merriman and Hannah Irwin helped support and track the data collection and forwarded the data as it became available throughout the summer. They also helped make sure that the naturalists were consistently handing out and collecting questionnaires as the summer progressed.

Scott Robinson assisted in creating the online questionnaire that is linked directly to the Walking Mountains website. Without him, there would have been many more paper questionnaires and likely fewer responses overall.

The 2015 naturalists who led the early childhood programs helped me collect data from families directly. Without them, I would not have been able to collect any data. Thank you!

Table of Contents

| | |
|--|----|
| Abstract..... | 3 |
| Acknowledgements..... | 4 |
| Introduction..... | 8 |
| I. Walking Mountains Science Center Community Programs | 8 |
| II. Early Childhood Programs..... | 8 |
| III. Walking Mountains Science Center Evaluation History..... | 9 |
| IV. Evaluation System Purpose and Users..... | 9 |
| V. Logic Model Development..... | 9 |
| VI. Pilot Test | 9 |
| Methods | 10 |
| I. Data collection instruments and design..... | 10 |
| II. Qualitative Analysis | 11 |
| III. Sampling and response rates..... | 15 |
| Data Analysis and Results | 15 |
| I. Post Program Questionnaire Responses..... | 15 |
| II. Program Retention Questionnaire Responses..... | 19 |
| III. Qualitative Analysis..... | 22 |
| A. 1-Month Retention Responses..... | 22 |
| B. 6-Month Retention Responses | 23 |
| Summary of Quantitative and Qualitative Results | 24 |
| Recommendations..... | 25 |
| I. Questionnaires Implementation and Modification Improvements..... | 25 |
| II. Intended Audience | 27 |
| III. Data Analysis..... | 28 |
| Evaluation system maintenance | 28 |
| Literature Cited..... | 29 |
| Appendices | 30 |
| I. Walking Mountains Science Center - Original Family Program Evaluation Form | 30 |
| II. Logic Model | 32 |
| III. Post Program Questionnaire | 33 |
| IV. Program Retention Questionnaire..... | 36 |
| V. Instructions and Protocols for Naturalists | 38 |
| VI. Data Collection Process for Community Program Coordinators and Director..... | 40 |
| VII. Emails – Follow-up with incentives..... | 42 |
| VIII. Post Program Questionnaire Full Write-Up | 44 |
| IX. Program Retention Questionnaire Full Write-Up for Earth Keepers – All Responses | 51 |
| X. Program Retention Questionnaire Comparison for Earth Keepers – 1-month response families and 6-month response families..... | 54 |
| XI. NAAEE Early Childhood Environmental Education Programs: Guidelines for Excellence Alignments..... | 56 |
| XII. Revised Post Program Questionnaire | 59 |
| XIII. Revised Program Retention Questionnaire | 61 |
| XIV. Training manual..... | 63 |
| XV. IRB application..... | 79 |

Table of Figures

| | |
|---|----|
| Figure 1. Mean responses of children's perceived satisfaction and outcome questions (post program questionnaire, all three programs included) | 16 |
| Figure 2. Mean results of family's satisfaction, intention and outcome questions. (Post Program Questionnaire, all three programs included) | 17 |
| Figure 3. Ethnic/racial identity responses (n=83). (Post Program Questionnaire, all three programs included)..... | 18 |
| Figure 4. Primary language spoken at home responses (n=89). (Post program questionnaire, all three programs included) | 18 |
| Figure 5. Children age responses, (n=81). 14 families indicated they had two children participating with them. (Post Program Questionnaire, all three programs included) 19 | |
| Figure 6. States from which families were visiting WMSC (n=81). 14 families reported that they attended with two children. (Post Program Questionnaire, all three programs included)..... | 19 |
| Figure 8. Mean responses to children's perceived experience questions, one month (n=6) and six months (n=6) after program participation. (Program Retention Questionnaire, Earth Keepers program only)..... | 20 |
| Figure 9. Mean responses to Family's Experience and Action questions, one month (n=6) and six months (n=6) after program participation. (Program Retention Questionnaire, Earth Keepers program only)..... | 21 |

Table of Tables

| | |
|--|----|
| Table 1. Total attendance, questionnaire responses and response rates collected during the pilot test. | 11 |
| Table 2. Comparison indicator collapsing for children specific question responses on the post program questionnaire. Responses NA, blank, and 1-3 were collapsed into low-specific, and responses 4-5 were collapsed into high-specific for comparison to program retention questionnaire questions..... | 11 |
| Table 3. Comparison indicator collapsing for family intention questions on the post program questionnaire. Responses NA, blank and 1-3 were collapsed into low-intention and responses 4- 5 were collapsed into high-intention for the comparison to program retention questionnaire questions..... | 12 |
| Table 4. Comparison indicator collapsing for children general questions on the program retention questionnaire. Responses NA, blank and 1-3 are collapsed into low-general and responses 4-5 were collapsed into high-general for the comparison to post program questionnaire questions. | 12 |
| Table 5. Comparison indicator recoding for family action questions on the program retention questionnaire. Responses NA, blank and 1-3 are collapsed into low-action and responses 4 and 5 are collapsed into high-action for the comparison to post program questionnaire questions. | 13 |
| Table 6. Question comparisons from the post program and program retention questionnaires, and the short hand question label used for the analyses. | 13 |
| Table 7. Indicator combinations and numeric values assigned to the compared questions related to the children's perceived specific and general experiences. | 14 |
| Table 8. Indicator combinations and numeric values assigned to the compared questions related to the family's intended and actionable experiences. | 14 |
| Table 9. Frequencies for indicator values on 1-month response families (n=6). (Program Retention Questionnaire, Earth Keepers program only)..... | 22 |
| Table 10. Frequencies for indicator values on 6-month response families (n=5). (Program Retention Questionnaire, Earth Keepers Program only)..... | 23 |
| Table A. Screenshot of excel workbook - post program templates within POSTPROG sheet. | 76 |
| Table B. Screenshot of excel workbook - post program templates within POSTPROG sheet. | 77 |
| Table C. Screenshot of excel workbook – program retention templates within RETENTION_ALL, RETENTION_EK, RETENTION_NT, and RETENTION_SS sheets..... | 78 |
| Table D. Screenshot of excel workbook - program retention templates within RETENTION_ALL, RETENTION_EK, RETENTION_NT, and RETENTION_SS sheets..... | 78 |

Introduction

There are a growing number of environmental education programs for pre-school aged children across the country. However, not much is known about these programs' effectiveness, partly because little is known about how to assess changes in young children's cognitive or affective outcomes. One goal of this project was to develop and pilot test an evaluation system for the Walking Mountains Science Center (WMSC) Community Programs to assess early childhood program outcomes and inform program improvements. Another goal of this evaluation was to create a self-sustaining system, as recommended in best practices for environmental education program evaluations and early childhood developmental research (Hysen et al. 1990, Miles and Huberman 1994, Powell et al. 2006, Stipek and Byler 2004, Zint et al. 2011).

I. Walking Mountains Science Center Community Programs

Most of WMSC funding comes from individuals (43%) and tuition and program fees (35%), while foundations, in-kind, corporate gifts, government and other sources make up the remaining portion of the revenue (WMSC Fiscal Year 2015 Annual Report). The Community Programs department at WMSC offers a wide array of program options throughout the year, including hikes and walks, early childhood programs, interpretive talks and other outreach programs. All programs are either free or low cost, and marketed toward local members of the Vail and Eagle County community as well as tourists. Over the last five years, Community Programs has increased its program offerings. In 2011, WMSC added a LEED platinum certified public education facility to their property in Avon, where they are now able to hold weekly early-childhood programs and offer additional programming, including adult learning lectures, films and seminars.

II. Early Childhood Programs

The mission of the Community Programs is to awaken a sense of wonder and inspire environmental stewardship and sustainability through natural science education. The early childhood programs embody this mission and are designed to facilitate English language acquisition, enhance literacy skills through science topics, and prepare young children with the developmental skills for kindergarten. The three programs, Earth Keepers, Nature Tykes, and Scenic Storytime, are aligned with Colorado State Preschool Science Academic Standards and this author found them to be aligned with the North American Association for Environmental Education Guidelines for Excellence for Early Childhood Environmental Education (NAAEE, 2010). Parents and young children participate together in the three program's activities with a naturalist, and the content revolves around local Colorado and Eagle Valley natural history, species, and people-nature interactions.

Earth Keepers is geared toward children ages 3-5. Over a 1.5-hour-long period, participants engage in indoor and outdoor activities revolving around a weekly theme, with a snack break in the middle. In the 2015 summer season, this program was offered twice a week and themes included insects, local trees, and a specific animal species and their roles in environment.

Nature Tykes is for 6–36 month-olds. The 45-minute program is shorter than the Earth Keepers Program. It is designed to help families spend time with their children outdoors while their children are very young, and to do so in a way that is comfortable for both the parents and children. This program was held once a week during the summer season.

Scenic Storytime is also offered for children ages 3-5, also accompanied by a family member. This roughly hour long program includes a naturalist-selected story for the day and exploration of the surrounding natural area and Eagle River. While the Earth Keepers and Nature Tykes are based out of WMSC in Avon, Scenic Storytime is based out of the Vail Nature Center.

III. Walking Mountains Science Center Evaluation History

To date WMSC has primarily evaluated its program success based on attendance records. WMSC has used a Family Program Evaluation Form (Appendix 1) that consisted of questions about the quality of the program experience; overall engagement (by asking the parent and child about their experience in the same question); safety; instructor knowledge, creativity, interest and preparedness and other general demographic and marketing-related measures. Despite asking for this information, it was not used to its fullest potential to help inform program decisions. In addition, education programs within other departments at WMSC have their own evaluation instruments measure knowledge and attitude changes in student participants after field trips ranging in length from day camps to backpacking trips. However, WMSC had not yet created a formalized evaluation system to assess possible changes in their early childhood program participants. This was the goal for this practicum.

IV. Evaluation System Purpose and Users

The evaluation system described in this practicum is designed to measure early childhood program participants' outcomes to inform future Community Program decisions. WMSC staff seek to ensure that their programs match their audiences' needs and interests. The evaluation system was designed such that WMSC staff can continuously implement all aspects of the proposed evaluation, including administration and revision data collection instruments, as well as data analysis.

V. Logic Model Development

At the start of this practicum, a logic model was created together by the author, Community Programs Director Lara Carlson, and Community Programs Coordinator Hannah Irwin (Appendix 2) to identify all three early childhood programs' desired outcomes. The logic model was developed based on "My Environmental Education Evaluation Resource Assistant" (MEERA, 2015) guidelines. Program outcomes were identified first and were based on the Colorado State Preschool Science Academic Standards as well as elements from the WMSC mission. For example, one *Short-term Outcome* is that child participants can make simple observations about their environment. An *Intermediate Outcome* is that child participants ask and pursue questions through investigations and observations. One *Long Term Outcome* is that adult participants express being comfortable engaging their child or children in the outdoors. It was determined that the three programs all seek to achieve the same outcomes.

VI. Pilot Test

Based on the outcomes identified through creating the logic model, two questionnaires were developed and designed to assess perceived children and family outcomes immediately after the program and one month later to begin assessing intermediate and long-term outcomes after families left the program. These two questionnaires, administered to all three early childhood programs, were tested during the summer 2015 season at WMSC. Analyses conducted on the pilot test results as part of this practicum were used to inform the evaluation system.

Methods

I. Data collection instruments and design

Given WMSC resource constraints, the decision was made to ask the family to report on the children's outcomes. As a result, these responses may not be reflective of the children's true experiences during the program and after the program ends. This report refers to "family" as the unit of analysis because families (parents/guardians and children) attended the program together. To clarify, only one adult (typically a parent) from each family completed the questionnaires, and this adult is who is being referred to when "family" is discussed.

Because all three early childhood programs seek to achieve the same outcomes, it was possible to administer the same data collection instruments across all three. One paper-based questionnaire, referred to as the post program questionnaire, was administered by the respective program naturalist to each family (a parent, grandparent, guardian, or babysitter) immediately following on-site program activities and collected before families left. In the last field of the questionnaire, families were asked to provide an email address for future data collection. A link to the second, electronic questionnaire, referred to as the program retention questionnaire, was emailed to families initially one month after their participation in the program, when families provided a valid email address at the end of the post program questionnaire. Two WMSC staff assisted in the development of instructions, and a schedule for how and when to administer the program retention questionnaire.

The two questionnaires each have three sections, all of which the family were asked to answer. The post program questionnaire included: questions related to the child's perceived experience with the program, the family's experience and behavioral intentions as a result of the program, and demographic information and marketing information such as asking how the family heard about the program. The first four questions asked about the children's satisfaction and outcomes, and included: my child enjoyed the activities in today's program; my child started using some of the new words introduced during the program; my child made and shared observations during today's program; and my child asked questions about the concepts discussed in today's program. Each question had five response options, labeled 1=strongly disagree, 3=neutral, 5=strongly agree.

The next five questions pertain to the family's satisfaction and intention, and included: The instructor was easy to hear and understand; I have a better understanding of stewardship behavior as a result of participating today; I plan on using the vocabulary and concepts introduced in today's program with my child; As a result of today's program, I am more likely to encourage my child to play outdoors; and lastly, Based on today's experience, I will recommend this program to other families. Again, the questions had five response options, labeled 1=strongly disagree, 3=neutral, 5=strongly agree. Please see Appendix 3 for the complete post program questionnaire.

The program retention questionnaire had a similar layout to the post program questionnaire and families were asked questions about what actions they engaged in based on their experience in the program one month earlier. The questions again asked about the child's perceived experience and the family's experience, and have behavioral questions corresponding to post program intention questions. Please see Appendix 4 for the complete program retention questionnaire.

To allow matching of post program and program retention responses, both questionnaires asked families to share their email address. Families were informed that their email would only be used to contact them after the program and for the purpose of matching responses.

II. Qualitative Analysis

Because of the low number of responses to the program retention questionnaire (see Table 1 below), comparisons between the post program questionnaires and the program retention questionnaires were conducted qualitatively. The unit of analysis for these comparisons was each family who completed both the post program and program retention questionnaires for the Earth Keepers program. Table 1 is explained in more detail in III. Sampling and response rates.

Table 1. Total attendance, questionnaire responses and response rates collected during the pilot test.

| Program | Total Number Attended | Post Program | Program Retention 1-month | Program Retention 6-month |
|------------------|-----------------------|--------------------------------|-------------------------------|-------------------------------|
| Earth Keepers | 149 | 82 <i>response rate=55%</i> | 6 <i>response rate=14%</i> | 6 <i>response rate=29%</i> |
| Nature Tykes | 30 | 8 <i>response rate=27%</i> | 1 <i>response rate=20%</i> | NA |
| Scenic Storytime | 10 | 2 <i>response rate=20%</i> | 0 <i>response rate=0%</i> | NA |

Several families who completed the program retention questionnaire had attended Earth Keepers more than once, so to keep the comparisons consistent, the first post program questionnaire responses were always used for comparison to the program retention questionnaire responses, regardless of how many times families attended the Earth Keepers program and completed a post program questionnaire.

The study was designed so that families' post program intentions would correspond to behaviors subsequently measured in the program retention questionnaire. The post program questionnaires measured two concepts as indicators of later results. First, post program questionnaire questions were assigned the indicator name "Specific" for the comparison with program retention questionnaire questions. "Specific" was selected because the questions on the post program questionnaire pertaining to the child's experience asked about that day's experience. N/A, blank responses, and 1-3 responses were collapsed into *low-specific*, and responses of 4-5 were collapsed into *high-specific* (Table 2).

Table 2. Comparison indicator collapsing for children specific question responses on the post program questionnaire. Responses NA, blank, and 1-3 were collapsed into low-specific, and responses 4-5 were collapsed into high-specific for comparison to program retention questionnaire questions.

| Post Program Questionnaire – Children Specific | Comparison Indicator | | | | | |
|---|----------------------|---|---|----------------------|---|---|
| | <i>Low-specific</i> | | | <i>High-specific</i> | | |
| Questions | NA/Blank | 1 | 2 | 3 | 4 | 5 |
| My child started using some of the new words introduced during the program (Q3_2) | | | | | | |
| My child made and shared observations during today's program (Q3_3) | | | | | | |

| | | |
|---|--|--|
| My child asked questions about the concepts discussed in today's program (Q3_4) | | |
|---|--|--|

Second, questions asking about the family's experience were assigned the indicator name "Intention." "Intention" was selected because questions pertaining to the family's experiences asked if they planned to engaged in certain actions based on that day's experience. N/A, blank responses, and 1-3 were collapsed into *low-intention*, and responses of 4-5 were collapsed *high-intention* (Table 3).

Table 3. Comparison indicator collapsing for family intention questions on the post program questionnaire. Responses NA, blank and 1-3 were collapsed into low-intention and responses 4-5 were collapsed into high-intention for the comparison to program retention questionnaire questions.

| Post Program Questionnaire – Family Intention | Comparison Indicator | | | | | |
|---|----------------------|---|---|---|-----------------------|---|
| | <i>Low-intention</i> | | | | <i>High-intention</i> | |
| | NA/Blank | 1 | 2 | 3 | 4 | 5 |
| Question | | | | | | |
| I have a better understanding of stewardship behavior as a result of participating today (Q4_2) | | | | | | |
| I plan on using the vocabulary and concepts introduced in today's program with my child (Q4_3) | | | | | | |
| As a result of today's program, I am more likely to encourage my child to play outdoors (Q4_4) | | | | | | |
| Based on today's experience I will recommend this program to other families (Q4_5) | | | | | | |

Program retention questionnaire questions measured self-reported behaviors performed after the program, and were designed to match the indicator variables above to the resulting behaviors performed. First, questions asking about the child's experience were assigned the indicator name "General." "General" was selected because questions pertaining to the child's experience in the program retention questionnaire ask if the child was exhibiting general patterns of behavior they had been introduced to during participation in the program. N/A, blank responses, and 1-3 were collapsed into *low-general*, and responses of 4-5 were collapsed into *high-general* (Table 4).

Table 4. Comparison indicator collapsing for children general questions on the program retention questionnaire. Responses NA, blank and 1-3 are collapsed into low-general and responses 4-5 were collapsed into high-general for the comparison to post program questionnaire questions.

| Program Retention Questionnaire – Children General | Comparison Indicator | | | | | |
|--|----------------------|---|---|---|---------------------|---|
| | <i>Low-general</i> | | | | <i>High-general</i> | |
| | NA/Blank | 1 | 2 | 3 | 4 | 5 |
| Question | | | | | | |
| My child has been using the vocabulary introduced during the program (Q1_2) | | | | | | |
| My child makes observations about his/her surroundings while outdoors (Q1_3) | | | | | | |
| My child asks questions about his/her surroundings while outdoors (Q1_4) | | | | | | |

Questions about the family’s experience were assigned the indicator name “Action.” “Action” was selected because the questions pertaining to the family’s experiences asked if they engaged in certain actions based on their participation in the program the month before. N/A, blank responses, and 1-3 were collapsed into *low-action*, and responses of 4-5 were collapsed into *high-action* (Table 5).

Table 5. Comparison indicator recoding for family action questions on the program retention questionnaire. Responses NA, blank and 1-3 are collapsed into low-action and responses 4 and 5 are collapsed into high-action for the comparison to post program questionnaire questions.

| Program Retention Questionnaire – Family Action | Comparison Indicator | | | | | |
|---|----------------------|---|---|-------------|---|---|
| | Low-action | | | High-action | | |
| | NA/Blank | 1 | 2 | 3 | 4 | 5 |
| Question | | | | | | |
| I have incorporated more stewardship behaviors into our household since participating in the program (Q2_1) | | | | | | |
| I have incorporated the vocabulary and concepts from the program into conversations with my child (Q2_2) | | | | | | |
| I have encouraged my child to explore the outdoors more since participating in the program (Q2_3) | | | | | | |
| I have recommended the Walking Mountains Science Center to others (Q2_6) | | | | | | |

Not all of the questions in the post program and program retention questionnaires have corresponding intention-behavior items. Below are the comparisons that could be made for the 11 families who completed both questionnaires (Table 6)¹.

Table 6. Question comparisons from the post program and program retention questionnaires, and the short hand question label used for the analyses.

| Post Program Questionnaire (specific/intention) | Program Retention Questionnaire (general/action) | Question Label |
|--|---|--------------------|
| My child started using some of the new words introduced during the program (Q3_2) | My child has been using the vocabulary introduced during the program (Q1_2) | Child-vocab |
| My child made and shared observations during today’s programs (Q3_3) | My child makes observations about his/her surroundings while outdoors (Q1_3) | Child-observations |
| My child asked questions about the concepts discussed in today’s program (Q3_4) | My child asks questions about his/her surroundings while outdoors (Q1_4) | Child-questions |
| I have a better understanding of stewardship behavior as a result of participating today | I have incorporated more stewardship behaviors into our household since participating | Family-stewardship |

¹ One family completed a program retention questionnaire but provided a different email address than the one they received the survey on, therefore there was no match for post program questionnaire responses.

| | | |
|--|--|-----------------------|
| (Q4_2) | in the program (Q2_1) | |
| I plan on using the vocabulary and concepts introduced in today's program with my child (Q4_3) | I have incorporated the vocabulary and concepts from the program into conversations with my child (Q2_2) | Family-vocab |
| As a result of today's program, I am more likely to encourage my child to play outdoors (Q4_4) | I have encouraged my child to explore the outdoors more since participating in the program (Q2_3) | Family-outdoors |
| Based on today's experience, I will recommend this program to other families (Q4_5) | I have recommended the Walking Mountains Science Center to others (Q2_6) | Family-recommendation |

Finally, the two children experience and two family experience indicators were combined into two matrices, as shown in Table 7 (children experiences) and Table 8 (family experiences). These matrices are used to analyze how results from the post program questionnaire compared to results from the program retention questionnaire. The four combinations for the children's experience and the family's experience questions were assigned numeric values, which were subsequently used to report frequencies of the different combinations. For example, if a parent indicated a low-specific response on the post program questionnaire but a high-general response on the program retention questionnaire, this would be coded as a 2. The author explores if families who may have indicated low-specific or low-intention responses in the post program questionnaire offered high-general or high-action responses on the program retention questionnaire (i.e. the values 2 and 4). These two values would suggest families followed through on particular behaviors or actions that they had intended to do.

Table 7. Indicator combinations and numeric values assigned to the compared questions related to the children's perceived specific and general experiences.

| | | Program Retention Questionnaire – Children (general) | |
|--|----------------------|--|-------------------------|
| | | <i>Low-general</i> | <i>High-general</i> |
| Post Program Questionnaire – Children (specific) | <i>Low-specific</i> | 1 <i>(low-low)</i> | 2 <i>(low-high)</i> |
| | <i>High-specific</i> | 3 <i>(high-low)</i> | 4 <i>(high-high)</i> |

Table 8. Indicator combinations and numeric values assigned to the compared questions related to the family's intended and actionable experiences.

| | | Program Retention Questionnaire – Family (action) | |
|---|-----------------------|---|-------------------------|
| | | <i>Low-action</i> | <i>High-action</i> |
| Post Program Questionnaire – Family (intention) | <i>Low-intention</i> | 1 <i>(low-low)</i> | 2 <i>(low-high)</i> |
| | <i>High-intention</i> | 3 <i>(high-low)</i> | 4 <i>(high-high)</i> |

III. Sampling and response rates

Based on attendance records, between June 15th and September 25th, 2015, 149 children participated in the Earth Keepers program, 30 children participated in Nature Tykes and 10 children participated in Scenic Storytime.

The author of this practicum conducted a brief training on site with the naturalists prior to the beginning of the summer program season. This training included oral and written instructions on how introducing the questionnaire and its importance with the family, as well how to administer the instrument and collect responses (Appendix 5). The author also worked with the Community Program Director and Community Program Coordinators to agree upon a data collection protocol to send completed post program questionnaires to the author in Michigan and a schedule for when to disseminate program retention questionnaire emails (Appendix 6). Every family who came to each program was asked but not required to complete a questionnaire during their visit.

A total of 92 families completed the post program questionnaire (Earth Keepers [n=82, response rate=55%], Nature Tykes [n=8, response rate=27%], Scenic Storytime [n=2, response rate=20%]). Forty-four families provided an email address on the initial questionnaire, 39 for Earth Keepers, 5 for Nature Tykes and none for Scenic Storytime. Approximately one month after the completion of each program, these families were emailed a link to the program retention questionnaire by WMSC staff. The program retention response totals were: Earth Keepers (n=6, response rate=15%), Nature Tykes (n=1, response rate=13%), and Scenic Storytime (n=0, response rate=0%).

Earth Keepers, which had the highest number of participants, also had the highest number of post program and program retention questionnaire responses compared to the other two programs. Therefore, subsequent comparative analyses only used data from the Earth Keepers program. To increase the response rate for the program retention questionnaire, the author attempted to obtain additional responses from families who completed the Earth Keepers post program questionnaire. More specifically, an additional email was sent January 15, 2016 to 28 families who had previously been emailed the link to the program retention questionnaire but not completed it (Appendix 7). Families were offered the chance to win an incentive to complete the program retention questionnaire, one of two \$50 punch cards for WMSC programs for the 2016 summer. Seven email addresses bounced back and 21 were delivered successfully. As a result, four additional families completed the program retention questionnaire.

A final request was sent January 26, 2016 to the remaining valid email addresses, offering a one-time \$200 incentive to complete the questionnaire (Appendix 7). Two more responses were collected as a result of this final email request, resulting in a total of 12 program retention responses (adjusted response rate = 29%).

Data Analysis and Results

I. Post Program Questionnaire Responses

Due to the relatively small sample sizes, options for statistical analyses were limited. Because post program data was available for all three programs, first an ANOVA test was run using Stata v.14 to determine if there were differences between the three programs. No statistically significant differences were found; therefore the following results include data from all three early childhood programs. An overview of responses (frequencies and means) including answers to open-ended questions can be found in Appendix 8.

The mean responses to the first set of questions on the post program questionnaire are shown in Figure 1. The first set of post program questions focused on the families' assessment of their children's experience. As shown below, families felt that their children had positive experiences overall. Families responded most favorably to the question: My child enjoyed the activities of today's program (mean=4.64), followed by: My child made and shared observations during today's program (mean=4.46) and My child started using some of the new words introduced during the program (mean=4.14). They responded less favorably to the question: My child asked questions about the concepts discussed in today's program (mean=3.96).

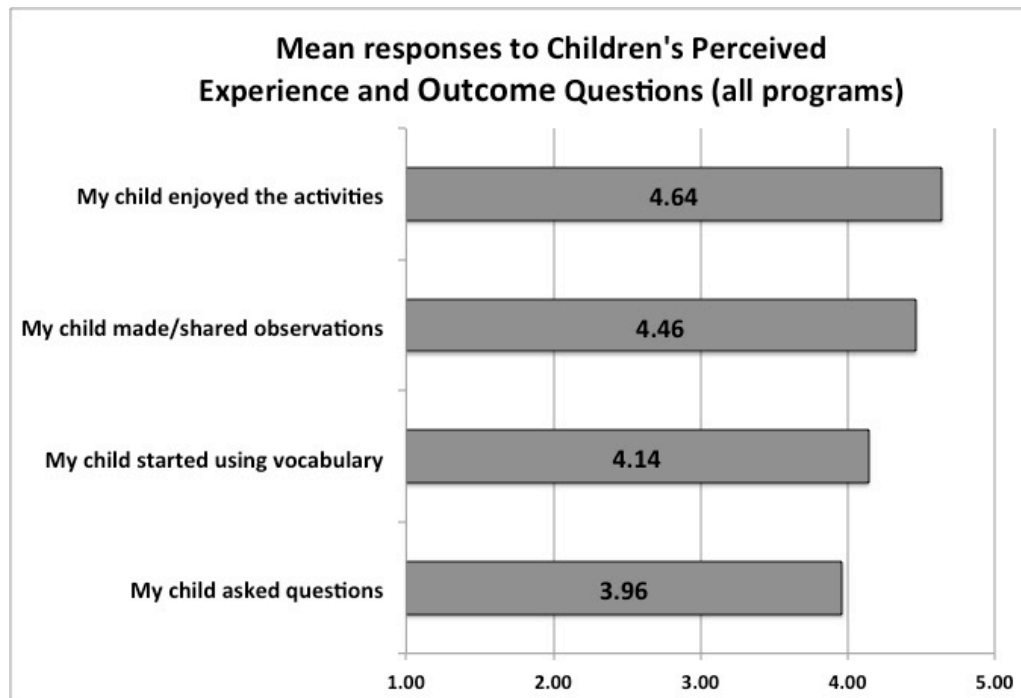


Figure 1. Mean responses of children's perceived satisfaction and outcome questions (post program questionnaire, all three programs included)

The second set of questions pertained to families' assessment of their experiences and intentions (Figure 2).

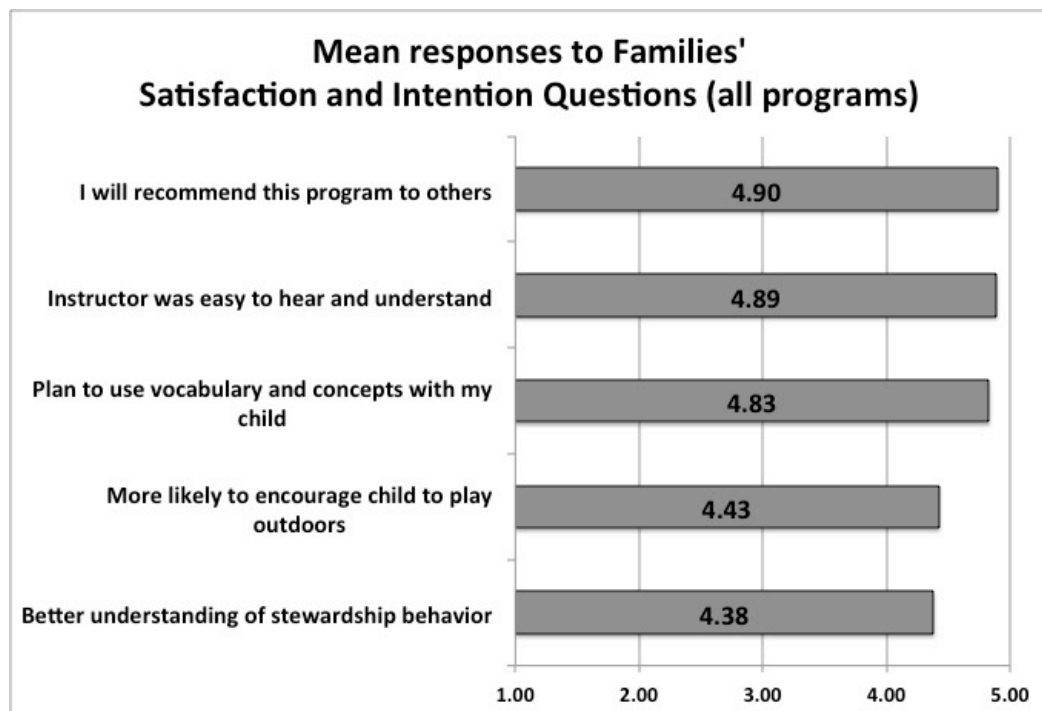


Figure 2. Mean results of family's satisfaction, intention and outcome questions. (Post Program Questionnaire, all three programs included)

Families responded favorably to the question about their satisfaction with the program. They indicated that they planned to recommend the program (mean=4.90) and rated the instructor favorably (mean=4.89). Families also responded favorably to two behavioral outcome intention questions with plans to use vocabulary rated somewhat more highly (mean=4.83) than intentions to encourage their children to play outdoors (mean=4.43). An additional outcome was that families also agreed that they had a better understanding of stewardship behavior as a result of their participation (mean=4.38).

Demographic information was also collected from families through the post program questionnaire, including what ethnic/racial group they identified with (Figure 3), what language they primarily spoke at home (Figure 4), and the age of the child (or children) with whom they participated (Figure 5). This information was collected to better understand who was attending the programs, as one of WMSC's goals is to have their audience be representative of the demographics found in Avon and Eagle Valley. A majority of participants were white and spoke English. Participating children ranged in age from 1 to older than 5, with a mean age of 3.7. Families were also asked where they were visiting from that day (Figure 6). A majority of families were from Colorado but families from 11 other states were also represented in the data. Specific cities listed in the responses are presented in Appendix 8.

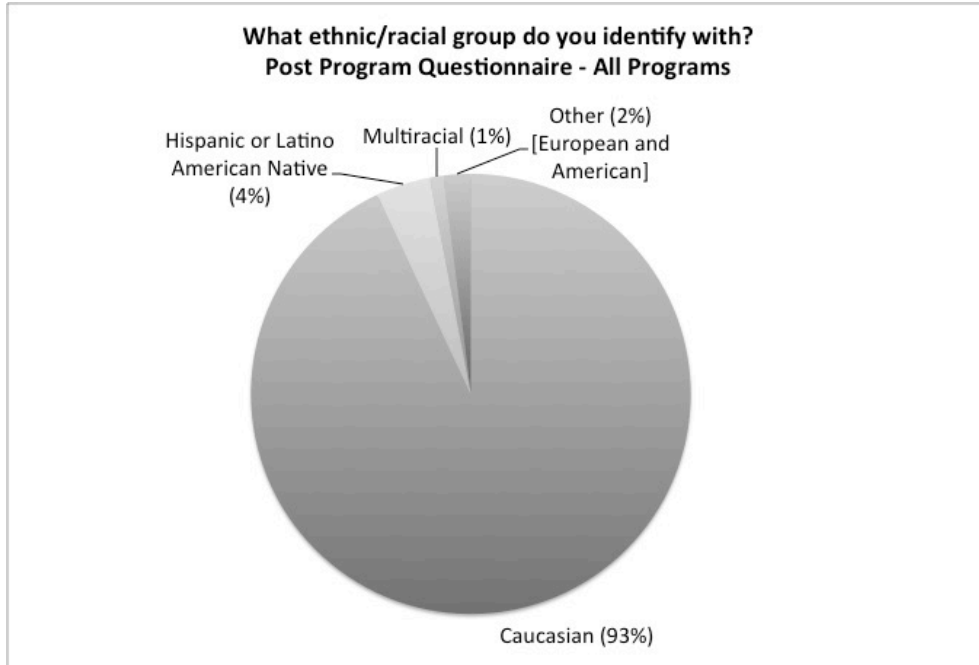


Figure 3. Ethnic/racial identity responses (n=83). (Post Program Questionnaire, all three programs included)

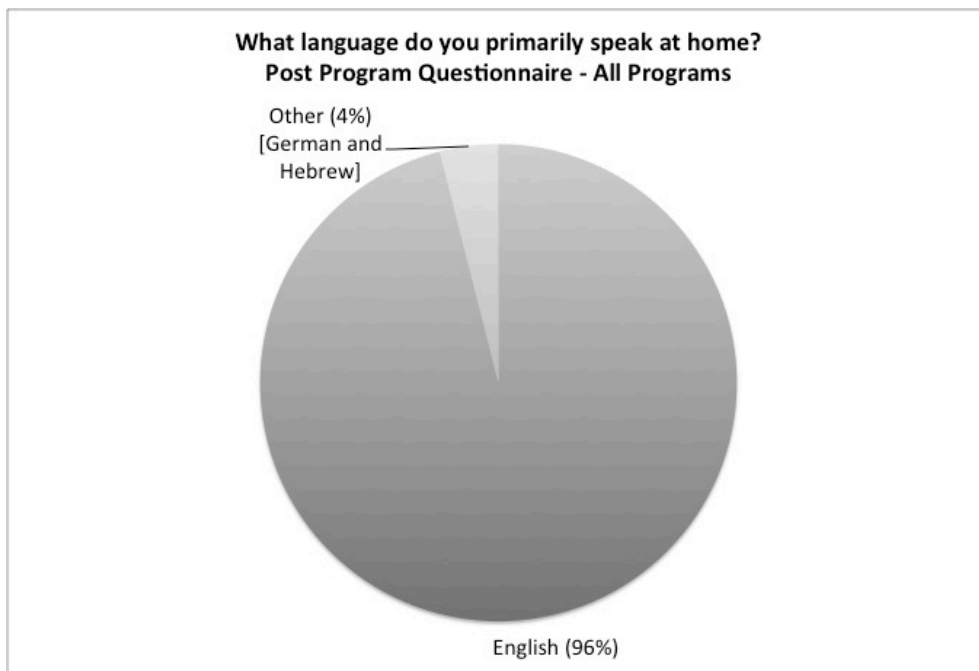


Figure 4. Primary language spoken at home responses (n=89). (Post program questionnaire, all three programs included)

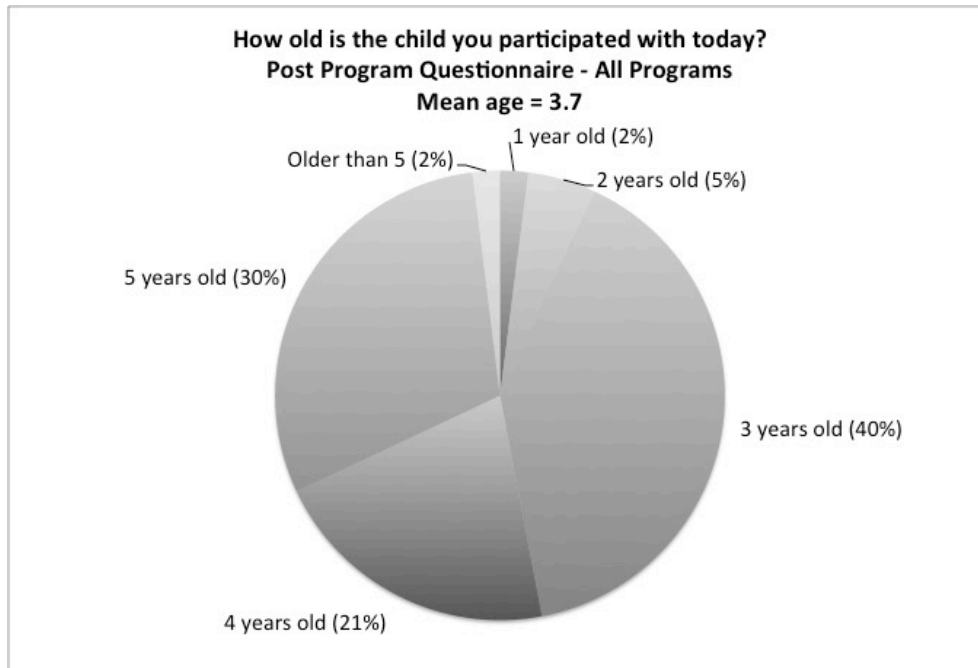


Figure 5. Children age responses, (n=81). 14 families indicated they had two children participating with them. (Post Program Questionnaire, all three programs included)

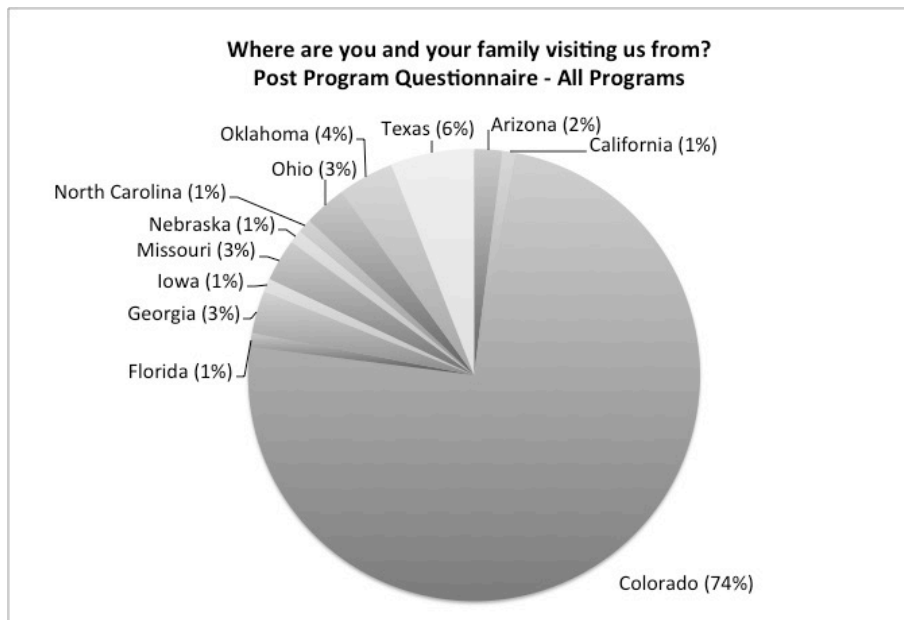


Figure 6. States from which families were visiting WMSC (n=81). 14 families reported that they attended with two children. (Post Program Questionnaire, all three programs included)

II. Program Retention Questionnaire Responses

A quantitative analysis of the program retention questionnaire results was only completed using Earth Keepers responses, as not enough families from Nature Tykes or Scenic Storytime responded to the program retention questionnaire. Twelve families responded to the program retention questionnaire for Earth Keepers: six completed the questionnaire over summer (between July 13 and September 8, 2015, “1-month responses”) and five completed the

questionnaire during winter after receiving the incentive emails (between January 15 and February 5, 2016, “6-month responses”). The two different program retention questionnaire time periods will be referred to as 1-month responses and 6-month responses. There was a sixth family who completed the program retention questionnaire for Earth Keepers, but the email address they provided could not be matched to a post program questionnaire. Responses from this family were included in the means and frequencies for the program retention responses, but excluded from qualitative post program-program retention comparisons.

Because of the limited number of responses to the program retention questionnaire, the following data are exploratory only and no generalizations can be drawn from them. Initial analyses of the program retention questionnaire data simply looked at the means of the two time periods. The data cannot provide a clear or accurate picture of all the families who completed the initial questionnaires, but these preliminary analyses give some sense of what families are or are not doing after they leave the program.

The following two figures provide an overview of program retention questionnaire results. Figure 8 summarizes mean perceived children’s experience and outcome results 1 month and 6 months after participation in the program, and Figure 9 summarizes families’ experiences and mean action results after the respective time periods.

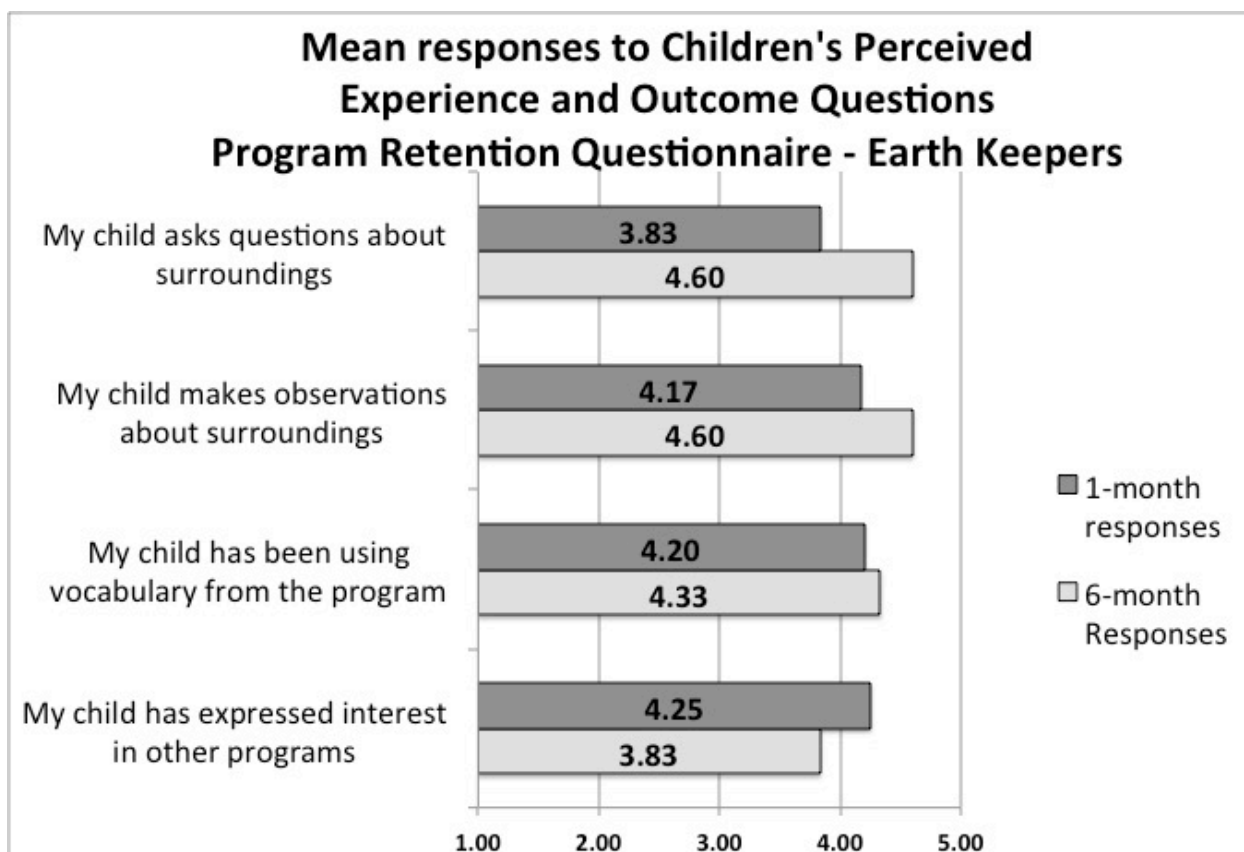


Figure 8. Mean responses to children’s perceived experience questions, one month (n=6) and six months (n=6) after program participation. (Program Retention Questionnaire, Earth Keepers program only)

Families who responded one month after the program (Figure 8) agreed that their children wanted to attend other programs WMSC offered. Families also agreed that their children had used the vocabulary from the program and made observations about their surroundings while

exploring outside. These families were less likely to agree that their children asked questions about what they saw outside.

Families who responded six months after the program (Figure 8) agreed that their children asked questions and made observations about their surroundings, in addition to having used vocabulary in the program. However, these families were less likely to agree that their children were interested in other programs at WMSC.

Sample sizes were too small to determine if 1-month family responses differed significantly from 6-month family responses. In three of the four questions, 6-month families' means appeared slightly higher than the means for 1-month families. It is possible that families in the 6-month response group had more time to observe what their children were doing or saying, and that they therefore reported more favorable responses to these questions. It is also possible that the addition of incentives to capture more program retention responses could have increased positive responses.

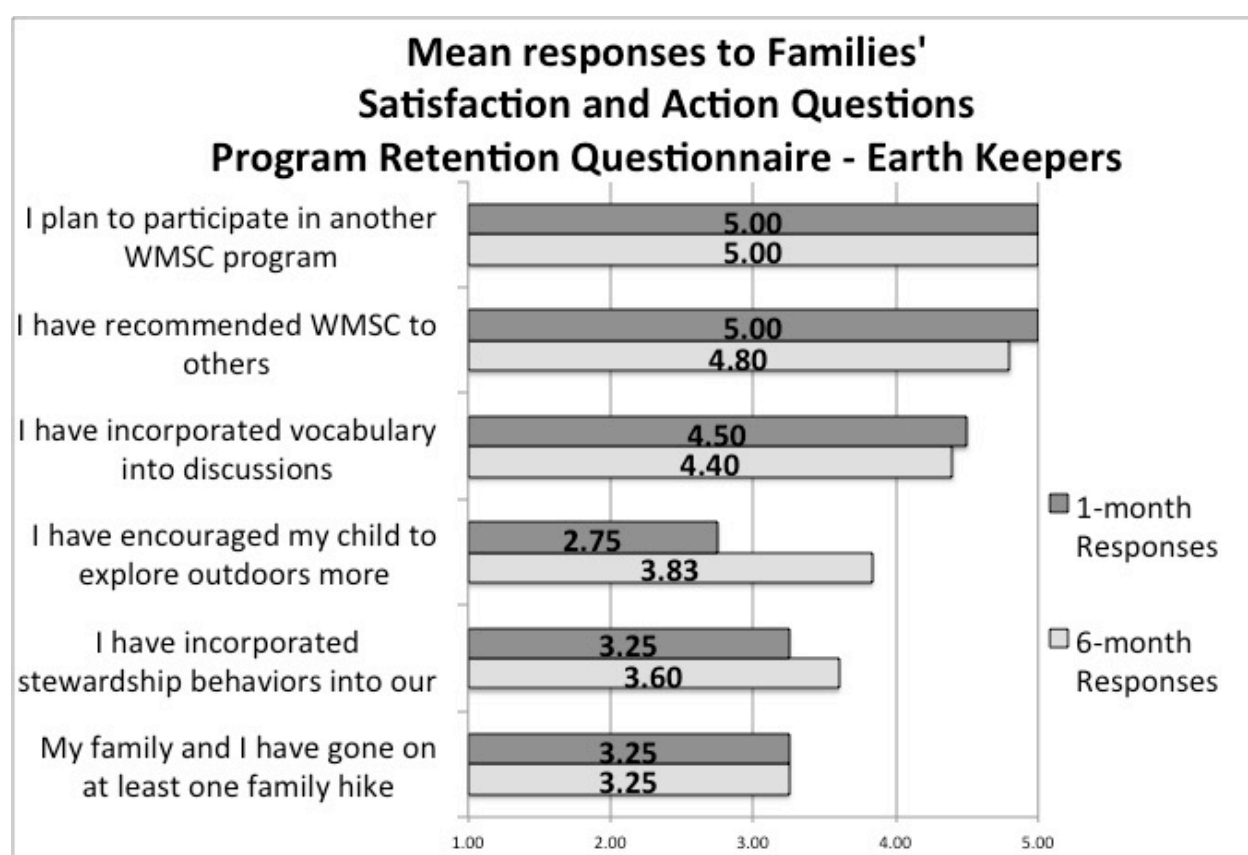


Figure 9. Mean responses to Family's Experience and Action questions, one month (n=6) and six months (n=6) after program participation. (Program Retention Questionnaire, Earth Keepers program only)

Almost all 12 families in both the 1-month and 6-month groups (Figure 9) indicated very favorably that they would participate in another WMSC program and recommend WMSC to other families. The majority also suggested that they incorporated vocabulary from the programs into conversations with their children.

Families in both groups, however, were far less likely to indicate that they had encouraged their children to explore the outdoors, incorporated stewardship behaviors or gone on a family hike since participating in the program. There did appear to be a noticeable difference

between one of these measures, with 1-month families indicating that they had not encouraged their children to explore the outdoors more whereas 6-month families offering a more favorable response to this measure.

Two open-ended questions on the post program questionnaire provided insights into what families found most engaging for their children as well as suggestions on how to improve the experience to better meet families' expectations. The engaging theme across all three post program questionnaires was being outdoors and interacting with the natural areas around WMSC and Vail Nature Center. Other common themes for Earth Keepers included arts and crafts, touching and collecting different fallen leaves, flowers and other hands on activities, and interactive games. For the Earth Keepers program, families identified several opportunities for program improvement, including more outdoor than indoor time, shorter lectures in favor of more activities, and higher expectations for parents to control children's behavior during the program.

III. Qualitative Analysis

The process for collapsing responses and signing values in order to conduct the comparisons in this section can be found in II. Qualitative Analysis of the Methods section, starting on page 11. An overview of the frequencies for both the 1-month and 6-month responses for the Earth Keepers program can be found in Appendix 9. An overview of the comparison of post program and program retention frequencies can be found in Appendix 10.

A. 1-Month Retention Responses

Due to the small number of total responses for the post questionnaire for the Earth Keepers program, a qualitative comparison of post program and program retention questionnaire responses was conducted. The 1-month response frequencies are listed in Table 9 below. The actual measures used in the questionnaires can be found in Table 6. Below, only the question labels are used.

Table 9. Frequencies for indicator values on 1-month response families (n=6). (Program Retention Questionnaire, Earth Keepers program only)

| <i>1-Month Responses (n=6)</i> | Indicator Value | | | |
|--------------------------------|------------------------|----------|----------|----------|
| Question | 1 | 2 | 3 | 4 |
| Child-vocab | 1 | 1 | 1 | 3 |
| Child-observations | 0 | 0 | 1 | 5 |
| Child-questions | 1 | 1 | 1 | 3 |
| Parent-stewardship | 0 | 1 | 3 | 2 |
| Parent-vocab | 0 | 0 | 2 | 4 |
| Parent-outdoors | 0 | 0 | 5 | 1 |
| Parent-recommendation | 1 | 0 | 1 | 4 |

For the child-vocab question comparison, responses varied across the four indicator values, suggesting families reported a mix of low- and high-specific behaviors on behalf of their children on the post program questionnaire and a mix of low- and high-general behaviors on the retention questionnaire. Four out of six families' response comparisons had indicators of 2 and 4, suggesting that these families followed through on incorporating vocabulary from the programs into conversations with their children.

For the child-observations question comparison, all six families reported high-specific behaviors on the post program questionnaire. One family reported low-general behavior on the

program retention questionnaire but five families reported high-general behavior, suggesting they had seen their children making observations about their surroundings while outdoors.

For the child-questions question comparison, responses again varied across the four indicator values, suggesting families reported a mix of both low- and high-specific behaviors from the post to the retention questionnaires. Again, four of six families' response comparisons had indicators of 2 and 4, suggesting that families had noticed their children asking questions about their surroundings while outdoors.

For the parent-stewardship question comparison, there was also a mix of low- and high-intention responses to the post program questionnaire, as well as low- to high-action responses on the retention questionnaire. Based on these responses, three of six families reported that they had followed through on incorporating stewardship behaviors into their household since participating in the program.

For the parent-vocab question comparison, all families reported high-intention on the post program questionnaire to incorporate vocabulary from the program into conversations with their children. Four of the six families reported high-action on the retention questionnaire, suggesting they had been using program vocabulary and concepts from the program in conversations with their children.

For the parent-outdoors question comparison, all six families reported high-intention on the post questionnaire to encourage their children to play outdoors more after leaving the program. However, only one of the six reported high-action at the time of the program retention questionnaire, suggesting that only this family encouraged their children to play outdoors more since the program.

For the parent-recommendation question comparison, there was a mix of low- and high-post program intentions. However, four of the six families reported having recommended WMSC to others one month after their participation in the program.

B. 6-Month Retention Responses

The 6-month response frequencies can be seen in Table 10 below.

Table 10. Frequencies for indicator values on 6-month response families (n=5). (Program Retention Questionnaire, Earth Keepers Program only)

| <i>6-Month Responses (n=5)</i> | Indicator Value | | | |
|--------------------------------|------------------------|----------|----------|----------|
| | 1 | 2 | 3 | 4 |
| Child-vocab | 1 | 0 | 0 | 4 |
| Child-observations | 0 | 0 | 1 | 4 |
| Child-questions | 0 | 1 | 1 | 3 |
| Parent-stewardship | 0 | 0 | 1 | 4 |
| Parent-vocab | 0 | 0 | 2 | 3 |
| Parent-outdoors | 0 | 1 | 1 | 3 |
| Parent-recommendation | 0 | 0 | 1 | 4 |

For the child-vocab question comparison, responses were only spread across two of the four indicator values. One of the five families fell into indicator 1, suggesting that they had not seen their children incorporate vocabulary from the program during the program or afterward. The remaining four families reported that they had observed their children use vocabulary and concepts from the program.

For the child-observations question comparison, the five families all reported high-specific behaviors on the post program questionnaire. One family reported low-general behavior on the program retention questionnaire but four families reported high-general behavior, suggesting they had seen their children making observations about their surroundings while outdoors since participating in the program.

For the child-questions question comparison, responses varied across the four indicator values, suggesting families reported a mix of both low- and high-specific behaviors from the post program to program retention questionnaires. Four of the five families' response comparisons had indicators of 2 and 4, suggesting that families had noticed their children asking questions about their surroundings while outdoors six months after participating in the program.

For the parent-stewardship question comparison, all five families reported high stewardship behavior intentions immediately after the program. Subsequently, four of the five families reported that they had followed through on these intentions since participating in the program.

For the parent-vocab question comparison, all families reported high-intentions on the post program questionnaire to incorporate vocabulary from the program into conversations with their children. However, only three of the five families reported following through on these intentions since participating in the program.

For the parent-outdoors question comparison, families reported both low- and high-intention on the post questionnaire to encourage their children to play outdoors more. Four of the five families reported high-action (indicators 2 and 4) at the time of the program retention questionnaire, suggesting that they had encouraged their children to play outdoors more since participating in the program.

For the parent-recommendation question comparison, all five families reported high-intentions to recommend the program after participating in it. Moreover, four of the five families reported having recommended WMSC to others six months after their participation in the program.

Summary of Quantitative and Qualitative Results

Based on the quantitative and qualitative results from the pilot study, in addition to the open-ended questionnaire responses, several preliminary conclusions about WMSC's early childhood programs can be offered:

The demographic data captured from the post program questionnaires collected during the 2015 summer season suggests that WMSC may not be reaching the range of target audiences. WMSC staff shared with the author that the community of Avon and Eagle County encompasses more diversity than what the data of predominantly Caucasian respondents suggests. Given that only 49% of all the families who attended the three programs responded to the post program questionnaire, it may be also that diverse audiences were less likely to complete the post program questionnaire than Caucasian audiences.

Families who participated in the three early childhood programs reported that they are satisfied with them overall. This was supported by their favorable responses to questions about intending to participate again, and that they would recommend the program to others immediately after the program, as well as their program retention responses indicating that they had attended other programs, their children had expressed interest in doing other programs, and that they had already recommended the program to others. Based on mean responses to the children's experience and outcome questions in both the post program and program retention

questionnaires, there is evidence that WMSC is realizing some of its desired children outcome goals. At the same time, given that means were about 4 on a 5-point scale, there is also room for improvement.

With regards to parental outcomes, families initially reported fairly high intentions to engage in WMSC desired outcomes. However, both the quantitative and qualitative results suggest that these intentions were not realized into behaviors one month or six months after the program. Evidence on parental outcomes was therefore not as strong as reported children's outcomes.

Lastly, when asked about what components of the program were most engaging for the children on the post program questionnaire, the main themes across all three programs were being outdoors, interacting with different elements of the natural area around both WMSC and the Vail Nature Center, and select activities including scavenger hunts, using magnifying glasses to look at insects, and turning over logs to look for fungi, bacteria and invertebrates.

Recommendations

I. Questionnaires Implementation and Modification Improvements

Post program questionnaire responses and response rates were reasonable to low for the three programs evaluated (n=10-14, r=20-55%). It should be possible to increase the number of families and response rates, given that many post program evaluations yield 80-100% response rates (Zint, personal conversation). Particularly troubling were the low responses and response rates for the retention questionnaires (1-month, all programs: n=0-6, r=0-20%; 6-month, Earth Keepers: n=6, r=29%), especially given the incentives used which consisted of two \$50-value program punch cards and a one-time \$200 monetary incentive. Increasing the number of responses and response rates is critical to be able to draw conclusions about families' experiences and outcomes. There are several recommendations that may help to increase response rates for both questionnaires:

Recommendation: Offer an incentive (e.g., food, chance to win a punch card, chance to win one free program) at the end of the program for families to complete the post program questionnaire.

Recommendation: Consider pilot-testing mailing a paper version of the program retention questionnaire (with a postage-paid return envelope) to determine if this (vs. an electronic approach) will yield higher responses and response rates.

Another issue that arose which limited the number of responses that could be matched was that not every family wrote their email address legibly. Several families also did not provide an email address at all, indicating in the space provided that WMSC already had their email address through families having signed up for the program, or based on marketing emails they had received. The language in the post program questionnaire thus needs to be more explicit about why families' email address is needed on the instrument.

Recommendation: Revise the text prompting families to write in an email address. The language should be explicit, stating the need for families to write down their email address, even if they have signed up for WMSC marketing emails separately. Below the current text is listed followed by suggested revised text, for both questionnaires.

Current text (post program questionnaire):

May we contact you via email in about a month to learn how this program may have further benefitted you?

If yes, please provide your email address below. Your email will not be associated with your responses. Your email will not be used for any other purpose, *unless you opted to receive Walking Mountains promotional emails when you registered for this program.*

Email address: _____

Suggested revised text (post program questionnaire):

May we contact you via email in about a month to learn how this program may have further benefitted you?

If yes, please **LEGIBLY PRINT** your email address below, even if you have separately signed up for Walking Mountains promotional emails. Your email will not be associated with your responses or used for any other purpose and is critical to enabling us to match your responses at the end of this program with ones provided in the future.

Email address: _____

Current text (program retention questionnaire):

Please provide us with your email address so we may match your responses with those you shared immediately after our program. Your email address will not be associated with your responses and will not be used for any other purpose *unless you opted to receive Walking Mountains promotional emails when you registered for the program.*

Email address: _____

Suggested revised text (program retention questionnaire):

Please provide us with the email address through which you were asked to complete this survey so that we can compare your responses in this questionnaire with those you shared immediately after our program. Your email will not be associated with your responses and will not be used for any other purpose except to match your responses.

Email address: _____

There were two weeks at the end of August where the naturalists leading Earth Keepers did not administer the post program questionnaire, which led to a gap in data collection. No information is available to explain why this occurred.

Recommendation: Revise questionnaire implementation and collection protocols to ensure blank post program questionnaires are kept in the classroom where Earth Keepers and Nature Tykes are held. This will help reduce the possibility of the naturalists leaving the questionnaires in the office and not administering them to families.

There were multiple post program questionnaires that were completed with markers, not pens or pencils, which made reading responses to open-ended questions difficult.

Recommendation: Revise questionnaire implementation and collection protocols to ensure pens or pencils are provided along with the questionnaires. It can be challenging for families to write legibly with markers.

The post program question asking about the age of the child participating currently only has space for one child's age to be indicated. Several families participated with two children but never more than two, and listed both ages, which presented a challenge for data entry. This question should be revised to offer two lines for Child 1 and Child 2, should families participate with more than one child.

Recommendation: Update and expand the text for the question asking about the age of the child participating today (see below).

Current text (post program questionnaire):

How old is the child you participated with today?

< 1 year old 1 2 3 4 5 Older than 5

Suggested revised text (post program questionnaire):

How old is the child (or children) you participated with today?

Child 1: < 1 year old 1 2 3 4 5 Older than 5

Child 2: < 1 year old 1 2 3 4 5 Older than 5

II. Intended Audience

Based on the demographics questions included in the post program questionnaire, the majority of families who responded were Caucasian, which is surprising given the demographics of Avon and Eagle County which are more diverse (U.S. Census Bureau, 2010). However, only 49% of all families who attended the three programs completed a post program questionnaire. It is therefore unclear if non-Caucasian families attended the programs and chose not to fill out the questionnaires, or if they did not attend the programs altogether.

Recommendation: Continue to encourage families to complete both questionnaires to examine if the demographic data becomes more representative of Avon and Eagle County residents.

Recommendation: Conduct a needs assessment with underrepresented audiences to determine what may attract them to the programs. For example, consider time of day the programs are offered, or transportation limitations families may have in getting to either WMSC or the Vail Nature Center.

Recommendation: Facilitate focus groups advertised and/or promoted to community members of Avon and the neighboring cities within Eagle County. Questions could revolve around generating new program content (to have WMSC better address community interests) and barriers that prevent families with children from attending (to improve programming to suit more community needs).

Based on developing the logic model and informal conversations with WMSC staff, the author learned that WMSC's early childhood programs are aligned with Colorado State Standards for Preschool. The author also completed an independent review of the programs based on the North American Association for Environmental Education (NAAEE) Early Childhood Guidelines, and found the programs were aligned with multiple Guidelines indicators (see Appendix 11 for alignments). This information is currently not shared on the program-specific webpages, so families may not know their children may benefit by participating in WMSC's programs.

Recommendation: Highlight on WMSC's website that the current early childhood programs are aligned with the Colorado State Standards for Preschool and NAAEE Early Childhood Guidelines. By being able to learn about these benefits, attendance in Nature Tykes and Scenic Storytime, in addition to Earth Keepers, may be increased.

Based on the recommendations provided in the Intended Audience section as well as the Questionnaire Implementation and Modification Improvements section, revised questionnaires have been provided in Appendix 12 (post program) and Appendix 13 (program retention).

III. Data Analysis

While means and frequencies can provide useful information about each of the three early childhood programs, additional statistical analyses could provide insights into what types of differences exist in responses. The sample sizes were large enough to test for differences between the three programs but they were too small to conduct additional comparisons.

Recommendation: Suggestions for future data analysis (when sample sizes are larger) include determining if there are differences in outcomes reported by families participating:

With children of different ages

For the first time compared to families who have participated multiple times

From out-of-town compared to local (Eagle County) families

Evaluation system maintenance

A training manual has been created, based on the preliminary results of the pilot study and recommendations for improvements (Appendix 14). The manual contains instructions for maximizing data collection and response rates, data entry, and analysis that can be used by WMSC staff. To facilitate WMSC's data analysis, the author also developed an Excel template because she anticipated that staff would be unlikely to have access to the statistical analysis software she used (i.e. Stata or R-Studio). WMSC staff will have the opportunity to learn about the evaluation system during a May 2016 professional development led by the author.

Before starting the evaluation system, it is recommended to recreate the program retention questionnaires under the email address of a WMSC staff member. Currently, the questionnaires' "owner" is the author of this practicum, and as this practicum has come to a conclusion on the part of the graduate student, it would be advised to recreate the questionnaires so that WMSC has full ownership of the data generated by the questionnaires moving forward. Before recreating the questionnaires, incorporate recommendations made earlier as they seem fit.

Literature Cited

- Hyson, M.C., Hirsh-Pasek, K, and Rescorla, L. 1990. The Classroom Practices Inventory: An Observation Instrument Based on NAEYC's Guidelines for Developmentally Appropriate Practices for 4- and 5-Year-Old Children. *Early Childhood Research Quarterly*, 5, 475-494.
- Miles, M.B. and Huberman, A.M. *Qualitative data analysis: An expanded sourcebook*. Beverly Hills: Sage Publications, 1994.
- North American Association for Environmental Education (NAAEE), 2010. *Early Childhood Environmental Education Programs: Guidelines for Excellence*. National Project for Excellence in Environmental Education.
- NAEYC and NAECS/SDE Position Statement. 2003. Early Childhood Curriculum, Assessment, and Program Evaluation: Building an Effective, Accountable System in Programs for Children Birth through Age 8. *National Association for the Education of Young Children*.
- Powell, R.B., Stern, M.C., and Ardoin, N. 2006. A Sustainable Evaluation Framework and Its Application. *Applied Environmental Education and Communication*, 5:231-241.
- Stipek, D. and Byler, P. 2004. The early childhood classroom observation measure. *Early Childhood Research Quarterly* 19 (2004) 375-397.
- United States Census Bureau. 2010. Profile of General Population and Housing Characteristics: 2010 Demographic Profile Data. Retrieved from:
<http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>
- Walking Mountain Science Center Fiscal Year 2015 Annual Report. FY 2015 Operating Revenues. Retrieved from: http://www.walkingmountains.org/wp-content/uploads/2014/02/Walking-Mountains-Science-Center-Fiscal-Year-2015-Annual-Report_WEB.pdf
- Zint, M.T., Dowd, P.F. and Covitt, B.A. 2011. Enhancing environmental educators' evaluation competencies: insights from an examination of the effectiveness of the *My Environmental Education Evaluation Resources Assistant* (MEERA) website. *Environmental Education Research*, Vol 17, No. 3, 471-497

Appendices

I. Walking Mountains Science Center - Original Family Program Evaluation Form



**Family Program
Evaluation Form**

Walking Mountains Science Center values your honest evaluation of our program. We will use your evaluation to help us improve our future programming. Please return this evaluation to the program instructor, welcome desk, or mail it to *Walking Mountains Science Center, P.O. Box 9469, Avon, CO 81620*.

Name _____

Email _____

Mailing Address _____

Phone Number _____ May we add you to our mailing lists? **Yes / No**

Program _____ **Date** _____

Please answer the questions below on a scale of 1 to 5 where
1=not at all, poor; 5=lots, definitely, great! or N/A =Not Applicable


How valuable was this program for you and your child(ren)? 1 2 3 4 5 N/A
Please comment.

Rate the quality of the learning experience. 1 2 3 4 5 N/A
Please comment.

Were you and your child(ren) actively engaged in the program? 1 2 3 4 5 N/A
Please comment.

How well was safety addressed both indoors and outdoors? 1 2 3 4 5 N/A
Please comment.

How well did this program meet your expectations? 1 2 3 4 5 N/A
Please comment.

OVER 

Please comment on the instructors that you observed in the following areas:

| | | | | | | | | | | | | | |
|------------------------|---|---|---|---|---|------------------------|--------------|---|---|---|---|---|-----|
| Instructor _____ | | | | | | Instructor _____ | | | | | | | |
| Knowledge | 1 | 2 | 3 | 4 | 5 | N/A | Knowledge | 1 | 2 | 3 | 4 | 5 | N/A |
| Creativity | 1 | 2 | 3 | 4 | 5 | N/A | Creativity | 1 | 2 | 3 | 4 | 5 | N/A |
| Interesting | 1 | 2 | 3 | 4 | 5 | N/A | Interesting | 1 | 2 | 3 | 4 | 5 | N/A |
| Preparedness | 1 | 2 | 3 | 4 | 5 | N/A | Preparedness | 1 | 2 | 3 | 4 | 5 | N/A |
| <i>Please comment:</i> | | | | | | <i>Please comment:</i> | | | | | | | |

How did you hear about this program? (Please mark all that apply.)

- We've been to programs at Walking Mountains Science Center before
- From visiting the Nature Discovery Center on Vail Mountain
- From visiting Walking Mountains Science Center in Avon
- Word of mouth
- Publications: _____ Vail Daily _____ ParentsHandbook _____ WhatToDo
- Media: _____ TV/8 _____ Radio – What Station? _____
- Internet: _____ Walking Mountains' website _____ Walking Mountains' blog
 _____ Twitter _____ Facebook _____ Email _____ Search Engine
- Other: Please specify _____

Can you suggest other topics you and your family may be interested in exploring with Walking Mountains Science Center?

What days and times are you and your family most likely to be available to participate in future programs with Walking Mountains Science Center?

What are the ages of your children? If local, what school(s) do your children attend?

Are you interested in receiving information about volunteering with Walking Mountains Science Center?

Yes No

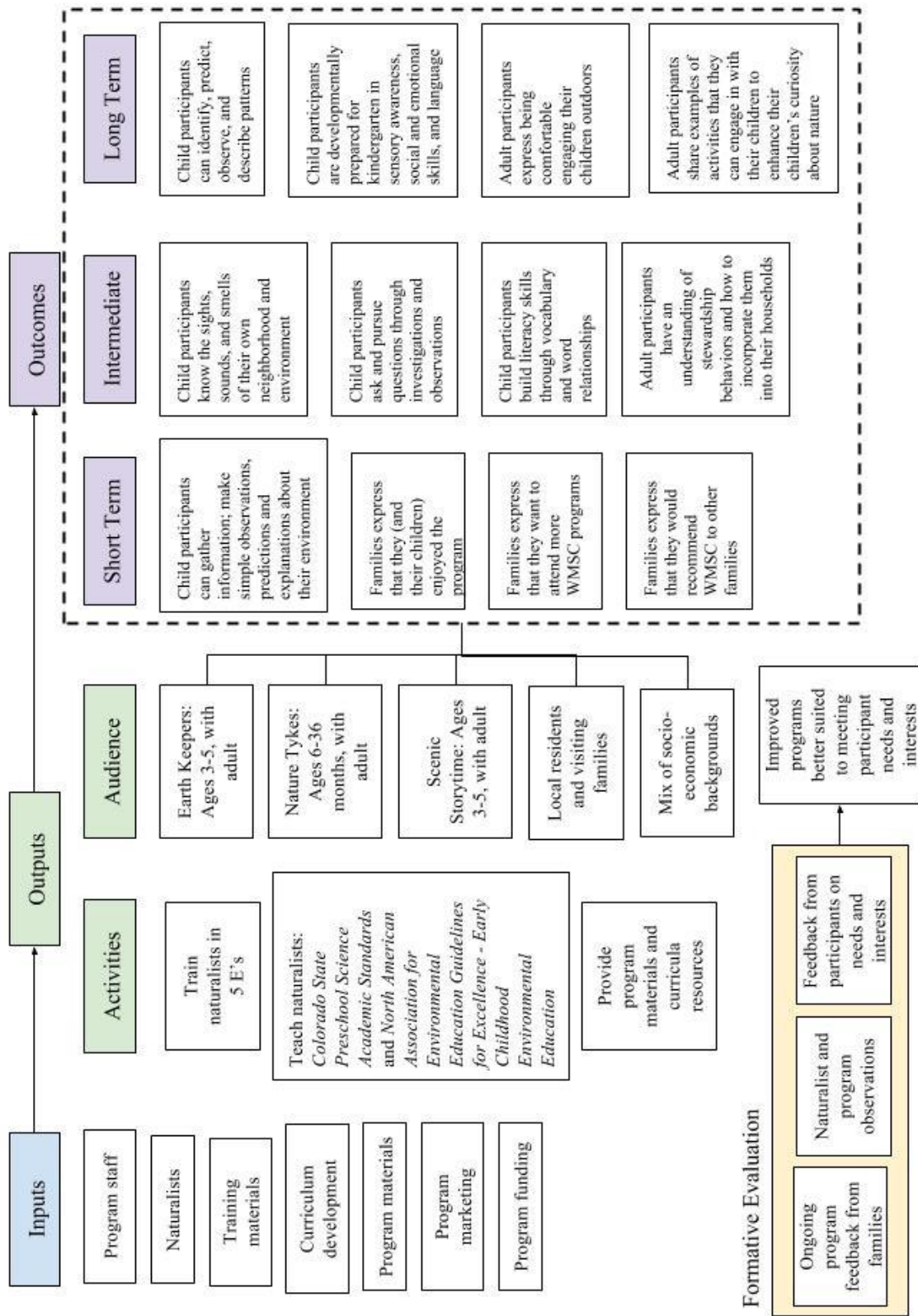
May we use your comments in future promotional materials?

Yes No

*Thank you for helping make this program a success! We sincerely appreciate your time and energy.
 ~ The Staff at Walking Mountains Science Center ~*

II. Logic Model

Logic Model - Walking Mountains Science Center Early Childhood Programs



III. Post Program Questionnaire



Thank you for participating in our program today!

Your responses will be used to improve this and other programs presented by Walking Mountains Science Center.

Today's date: _____

Which program did you participate in today? *Circle one.* EarthKeepers / Nature Tykes / Scenic Storytime

How strongly do you agree or disagree with the following questions based on **your child's experience** today?

| <i>Circle one for each question</i> | Strongly Disagree | 2 | 3 | 4 | Strongly Agree | N/A |
|---|----------------------|---|---|---|-------------------|-----|
| My child enjoyed the activities in today's program. | 1 | 2 | 3 | 4 | 5 | N/A |
| My child started using some of the new words introduced during the program. | 1 | 2 | 3 | 4 | 5 | N/A |
| My child made and shared observations during today's program. | 1 | 2 | 3 | 4 | 5 | N/A |
| My child asked questions about the concepts discussed in today's program. | 1 | 2 | 3 | 4 | 5 | N/A |

Describe what aspect of today's program was most engaging for your child.

How strongly do you agree or disagree with the following questions based on **your experience** today?

| <i>Circle one for each question</i> | Strongly Disagree | 2 | 3 | 4 | Strongly Agree | N/A |
|---|----------------------|---|---|---|-------------------|-----|
| The instructor was easy to hear and understand. | 1 | 2 | 3 | 4 | 5 | N/A |
| I have a better understanding of stewardship behavior as a result of participating today. | 1 | 2 | 3 | 4 | 5 | N/A |

I plan on using the vocabulary and concepts introduced in today's program with my child. 1 2 3 4 5 N/A

As a result of today's program, I am more likely to encourage my child to play outdoors. 1 2 3 4 5 N/A

Based on today's experience, I will recommend this program to other families. 1 2 3 4 5 N/A

How could this program be improved to meet your/your family's expectations?

Where are you and your family visiting us from today? (*city, state*)

Have any members of your family attended programs at Walking Mountains Science Center before?

_____ Yes. *Please specify which programs:* _____
 _____ No.

How did you hear about today's program (EarthKeepers, Nature Tykes or Scenic Storytime)?

- | | | |
|--|---|---|
| <input type="checkbox"/> Email from Walking Mountains Science Center | <input type="checkbox"/> TV8 Vail | <input type="checkbox"/> VVP (Vail Valley Partnership) |
| <input type="checkbox"/> Vail Daily | <input type="checkbox"/> Internet Search | <input type="checkbox"/> VCBA (Vail Chamber & Business Association) |
| <input type="checkbox"/> Parent's Handbook | <input type="checkbox"/> Walkingmountains.org | <input type="checkbox"/> My child attended a school program |
| <input type="checkbox"/> WhatToDo | <input type="checkbox"/> Vail.net | <input type="checkbox"/> Recommended by a friend |
| <input type="checkbox"/> Brochure | <input type="checkbox"/> Vail.com | <input type="checkbox"/> Other, <i>specify:</i> _____ |
| | <input type="checkbox"/> Vail Rec District | |

What ethnic/racial group do you identify with?

- | | |
|---|--|
| <input type="checkbox"/> American Indian or Alaska Native | <input type="checkbox"/> Hispanic or Latino American Native |
| <input type="checkbox"/> Asian | <input type="checkbox"/> Native Hawaiian or Other Pacific Islander |
| <input type="checkbox"/> Black or African | <input type="checkbox"/> Multiracial |
| <input type="checkbox"/> Caucasian | <input type="checkbox"/> Other, <i>specify:</i> _____ |

What language(s) do you primarily speak at home?

English Other, *language(s):* _____

How old is the child you participated with today?

< 1 year old 1 2 3 4 5 Older than 5

If you live locally, what school(s) does your child/do your children attend?

School(s): _____

May we contact you via email in about a month to learn how this program may have further benefitted you?

If yes, please provide your email address below. Your email will not be associated with your responses. Your email will not be used for any other purpose, *unless you opted to receive Walking Mountains promotional emails when you registered for this program.*

Email address _____

IV. Program Retention Questionnaire



Thank you for participating in Earth Keepers last month!

*****THIS QUESTIONNAIRE WILL BE MOVED INTO AN ONLINE VERSION!*****

Your responses to the following questions will help us continue to make improvements to this program as well as other programs presented by Walking Mountains Science Center.

How strongly do you agree or disagree with the following questions, based on **your child's participation** in our program last month?

| <i>Strongly</i> <i>Circle one for each question</i> | Strongly | | | | | |
|---|----------|---|--------|---|-------|-----|
| | Disagree | | Unsure | | Agree | |
| My child has expressed interest in doing other programs with Walking Mountains Science Center | 1 | 2 | 3 | 4 | 5 | N/A |
| My child has been using the vocabulary introduced during the program. | 1 | 2 | 3 | 4 | 5 | N/A |
| My child makes observations about his/her surroundings while outdoors. | 1 | 2 | 3 | 4 | 5 | N/A |
| My child asks questions about his/her surroundings while outdoors. | 1 | 2 | 3 | 4 | 5 | N/A |

How strongly do you agree or disagree with the following questions, based on **your participation** in our program last month?

| <i>Circle one for each question</i> | Strongly Disagree | | Unsure | | Strongly Agree | |
|---|----------------------|---|--------|---|-------------------|-----|
| I have incorporated more stewardship behaviors into our household since participating in the program. | 1 | 2 | 3 | 4 | 5 | N/A |
| I have incorporated the vocabulary and concepts from the program into conversations with my child. | 1 | 2 | 3 | 4 | 5 | N/A |
| I have encouraged my child to explore the outdoors more since participating in the program. | 1 | 2 | 3 | 4 | 5 | N/A |
| My family and I have gone on at least one family hike since participating in the program. | 1 | 2 | 3 | 4 | 5 | N/A |
| I plan to participate in another Walking Mountains Science Center program. | 1 | 2 | 3 | 4 | 5 | N/A |

I have recommended the Walking Mountains Science Center to others. 1 2 3 4 5 N/A

If your child or your family has not spent more time exploring the outdoors since participating in a Walking Mountains Science Center program, why not:

During your Walking Mountains Science Center visit, were you:

A resident of Eagle County.

Not a resident of Eagle County.

Have you attended any of our other programs since participating last month?

Yes. *Please specify which programs:* _____

No. *Why not:* _____

Is there anything else you would like to share with us?

Please provide us with your email address so we may match your responses with those you shared immediately after our program. Your email will not be associated with your responses, and will not be used for any other purpose *unless you opted to receive Walking Mountains promotional emails when you registered for the program.*

Email address: _____

V. Instructions and Protocols for Naturalists

Questionnaire Information and Protocols Earth Keepers, Nature Tykes and Scenic Storytime

Instructions for introducing the questionnaire

- At the end of your introduction, you could say something like:
 - "...and at the end of this program, we would greatly appreciate you taking just a few minutes to complete a brief questionnaire about your experience today. I will discuss this more at the end of our program."
- Run your program!
- At the end of your conclusion, talk about it again:
 - "As I mentioned at the start of the program, we would greatly appreciate your feedback in filling out this brief questionnaire. We are currently working with a graduate student at the University of Michigan to start a formal evaluation on our three early childhood programs to see how well they are achieving the goals we have set."
 - "It's voluntary to fill this questionnaire out. Your feedback will help us better understand where our program is succeeding and where there is room for improvement, so we strongly encourage you to take just a few minutes to fill this out."

Things that may come up from parents

- Email address question at the end of the questionnaire:
 - You can point out the text at the end of the second page if they didn't read it fully
 - Assure families that this information will not be shared with anyone outside of WMSC besides the graduate student, and that it will not be associated with their answers in any way.
 - If they provide an email address for the questionnaire, this will not change their preferences for opting in to receive promotional emails
- As the summer progresses, some families may be returning and say so when you hand out the questionnaire
 - They are welcome to complete the questionnaire again, since it would likely be a different topic and possibly a different naturalist, and they can choose if they want to put their email or not

Administering and Collecting

- Distribute questionnaires to the parents at the end of your conclusion
- Allow families to return the questionnaires to the envelope directly
- After all families have left, briefly review the completed questionnaires

- Check that the date and program circled are both correct for what you presented on
 - Keep blank ones for your next program
- Place the questionnaires back in the envelope
 - If you collect several programs worth of questionnaires before submitting them to Lara, please group the questionnaires by date and program (stapled or paper clipped is fine)
- Return the questionnaires to Lara the next time you have office hours

VI. Data Collection Process for Community Program Coordinators and Director

Protocols for Data Collection – June 2015 through October 2015

1. Double-check the questionnaires – date clear and correct program circled?
2. Add emails from questionnaire to the excel spreadsheet
H:\Shared\Programs\Community Programs\Administration\Nikki Muench - Research
 - a. Early Childhood Programs – Email Addresses.xls
3. Scan and email all completed questionnaires to Nikki on Wednesdays for previous week
 (Thursday NT, Friday EK, Sunday SS, Monday EK)
 - a. nrmuench@umich.edu
 - b. Ideally organized by date/program
4. One month later, email families with follow-up questionnaire (mid-week, afternoon)
 - a. One email for each program – Monday/Friday EarthKeepers can be sent one email

Suggested weeks to send follow-up email (based on Mondays of each week):

July 12 – week of 6/14
 July 19 – week of 6/21
 July 26 – week of 6/28

August 2 – week of 7/5
 August 9 – week of 7/12
 August 16 – week of 7/19
 August 23 – week of 7/26
 August 30 – week of 8/2

September 6 – week of 8/9
 September 13 – week of 8/16
 September 20 – week of 8/23
 September 27 – week of 8/30

October 5 – week of 9/6
 October 12 – week of 9/13
 October 19 – week of 9/20
 October 26 – week of 9/27

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|-----------------|-----------------|---------|-----------|-----------------|-----------------|----------|
| June 14 | 15 EK | 16 | 17 | 18 NT | 19 EK | 20 |
| 21 SS | 22 EK | 23 | 24 | 25 NT | 26 EK | 27 |
| 28 SS | 29 EK | 30 | July 1 | 2 NT | 3 EK | 4 |
| 5 SS | 6 EK | 7 | 8 | 9 NT | 10 EK | 11 |
| 12 SS | 13 EK | 14 | 15 | 16 NT | 17 EK | 18 |
| 19 SS | 20 EK | 21 | 22 | 23 NT | 24 EK | 25 |
| 26 SS | 27 EK | 28 | 29 | 30 NT | 31 EK | August 1 |
| 2 SS | 3 EK | 4 | 5 | 6 NT | 7 EK | 8 |
| 9 SS | 10 EK | 11 | 12 | 13 NT | 14 EK | 15 |
| 16 SS | 17 EK | 18 | 19 | 20 NT | 21 EK | 22 |
| 23 SS | 24 EK | 25 | 26 | 27 NT | 28 EK | 29 |
| 30 SS | 31 EK | Sept. 1 | 2 | 3 NT | 4 EK | 5 |
| 6 SS | 7 EK | 8 | 9 | 10 NT | 11 EK | 12 |
| 13 SS | 14 EK | 15 | 16 | 17 NT | 18 EK | 19 |
| 20 SS | 21 EK | 22 | 23 | 24 | 25 EK | 26 |
| 27 SS | 28 EK | 29 | 30 | Oct. 1 | 2 EK | 3 |

VII. Emails – Follow-up with incentives

Sent January 15, 2016 – Subject: Walking Mountains Science Center – Earth Keepers Feedback

Hello Friends of Walking Mountains Science Center,

I am a graduate student at the University of Michigan and have been working with Walking Mountains Science Center this past year.

You may recall being asked to complete a questionnaire about your child's or children's experience with the Walking Mountains' Earth Keepers program this past summer.

This data provide the basis for my thesis, which focuses on how Walking Mountains may be able to improve its programs for children like yours.

To be able to offer the best possible recommendation to Walking Mountains (and graduate), I need more of your feedback. Now that some time has passed since you have participated in the program, it would be very valuable for me to learn if the program had a continued impact.

Please consider completing the questionnaire:

[EarthKeepers Follow-up Questionnaire](#)

by January 29, 2016.

Two individuals who complete the questionnaire will be randomly selected to receive a Walking Mountains Science Center punch card (\$50 value, one child/one adult attendance to five Earth Keepers programs, good for one year).

THANK YOU for considering completing the questionnaire and helping Walking Mountains continue to improve their programs to better meet the needs of families like yours. Please feel free to contact me with any questions!

Sincerely,

Nicole Muench

nrmuench@umich.edu | 510-529-1000

M.S. Candidate 2016 | Behavior, Education, and Communication

School of Natural Resources and Environment | University of Michigan

Sent January 26, 2016 - Subject: Walking Mountains Science Center – Earth Keepers Feedback

Hello Friends of Walking Mountains Science Center,

This is a reminder that there is still time to complete the follow-up questionnaire on your Earth Keepers experience from this past summer. Below is my email from about a week ago - again, I and Walking Mountains greatly value your feedback to continue to improve the programs for families like yours.

Please consider completing the questionnaire ([EarthKeepers Follow-up Questionnaire](#)) by this Friday, January 29 to be entered into the drawing for one of two Walking Mountains Science Center punch card (\$50 value, one child/one adult attendance to five Earth Keepers programs, good for one year).

Thank you for considering completing the questionnaire. Please feel free to contact me with any questions.

Sincerely,

Nicole Muench

nrmuench@umich.edu | 510-529-1000

M.S. Candidate 2016 | Behavior, Education, and Communication

School of Natural Resources and Environment | University of Michigan

Sent February 5, 2016 - Subject: [Final Reminder] Walking Mountains Science Center – Earth Keepers Feedback

Hello friends of Walking Mountains,

I am a graduate student at the University of Michigan and have been working with Walking Mountains Science Center this past year. Back on January 15, I emailed you with a questionnaire to better understand how your experience with the Earth Keepers program this past summer has continued to impact you and your family. This original email can be found below.

I am still in need of a few more responses, so I am extending the deadline and have added an additional one-time incentive of \$200 to one family who completes the questionnaire. (This is in addition to the two \$50 punch cards.)

Please consider completing the questionnaire:

[EarthKeepers Follow-up Questionnaire](#)

By February 12, 2016

Thank you for considering completing the questionnaire and helping Walking Mountains continue to improve their programs to better meet the needs of families like yours.

If you have any questions, please don't hesitate to contact me.

Sincerely,

Nicole Muench

nrmuench@umich.edu | 510-529-1000

M.S. Candidate 2016 | Behavior, Education, and Communication
School of Natural Resources and Environment | University of Michigan

VIII. Post Program Questionnaire Full Write-Up

Post Program Questionnaire Responses – All Questions and Programs**Q1** Today's date

Summer season began June 15, 2015. Programs ran once or twice a week through September 25, 2015.

Q2 Which program did you participate in today?

[n=92] Earth Keepers (89%) Nature Tykes (9%) Scenic Storytime (2%)

An ANOVA test was run to determine if there were differences between programs across the following questions. There were no statistically significant differences found, therefore the following analysis was done with all three programs together.

How strongly do you agree or disagree with the following questions based on **your child's experience** today?

Q3_1 My child enjoyed the activities in today's program

[n=89] 2 (2%) Unsure (6%) 4 (18%) Strongly Agree (74%)

Q3_2 My child started using some of the new words introduced during the program

[n=86] Strongly Disagree (1%) 2 (5%) Unsure (20%) 4 (28%) Strongly Agree (46%)

Q3_3 My child made and shared observations during today's program

[n=90] Strongly Disagree (1%) 2 (3%) Unsure (7%) 4 (26%) 4.5 (1%) Strongly Agree (62%)

Q3_4 My child asked questions about the concepts discussed in today's program

[n=83] Strongly Disagree (2%) 2 (15%) Unsure (17%) 4 (17%) Strongly Agree (49%)

Q3_TEXT Describe what aspect of today's program was most engaging for your child (by program date)

[n=77] Please see sub-appendix A for responses

How strongly do you agree or disagree with the following questions based on **your experience** today?

Q4_1 The instructor was easy to hear and understand

[n=90] 2 (1%) 4 (8%) Strongly Agree (91%)

Q4_2 I have a better understanding of stewardship behavior as a result of participating today

[n=85] 2 (4%) Unsure (12%) 4 (27%) 4.5 (1%) Strongly Agree (56%)

Q4_3 I plan on using the vocabulary and concepts introduced in today's program with my child

[n=88] Strongly Disagree (1%) 2 (1%) 4 (9%) Strongly Agree (89%)

Q4_4 As a result of today's program, I am more likely to encourage my child to play outdoors

[n=80] Strongly Disagree (4%) 2 (2%) Unsure (9%) 4 (17%) Strongly Agree (68%)

10 families responded N/A and three 3 families wrote they already do this.

3 families responded Strongly Disagree and all three wrote they already do this.

Q4_5 Based on today's experience, I will recommend this program to other families

[n=89] 2 (1%) 4 (7%) Strongly Agree (92%)

Q4_TEXT How could this program be improved to meet you/your family's expectations?

[n=37] Please see sub-appendix A for responses

Tell us a little bit more about you and your family!

Q5_TEXT Where are you and your family visiting us from today? (city, state)

[n=82] Please see Appendix A for full range of responses

Q6 Have any members of your family attended programs at Walking Mountains Science Center before?

[n=82] Yes (63%) No (37%)

Q6_TEXT Please specify which programs (if Yes to Q6)

[n=40] 40 families answered this question, but several specified more than one program for this fill-in-the-blank.

Animal Tracks (1) Astronomy (2) Beaver Pond Vail (1) EarthKeepers (29) Native American (1) Nature Talk Vail (1) Nature Tykes (3) Nest Class – May (1) Scenic Storytime (1)

Other responses: "I taught at GES, first grade field trips." "Mom and Dax."

Q7_A How did you hear about today's program? (Response 1)

[n=77] Email from WMSC (8%) Vail Daily (8%) Parent's Handbook (1%) WhatToDo (1%) Brochure (4%) TV8 Vail (1%) Internet Search (10%) Walkingmountains.org (16%) Vail.com (1%) School Program (3%) Friend Recommendation (25%) Other (22%)

Q7_B How did you hear about today's program? (Response 2)

[n=8] Parent's Handbook (25%) WhatToDo (38%) Brochure (12%) Walkingmountains.org (13%) Friend Recommendation (12%)

Q7_C How did you hear about today's program? (Response 3)

[n=4] WhatToDo (50%) Walkingmountains.org (25%) Other (25%)

Q7_ALL How did you hear about today's program?

[n=88] Please see sub-appendix A for full responses.

Q7_TEXT Please specify (other)

[n=17] Please see sub-appendix A for full responses.

Q8_A What ethnic/racial group do you identify with? (Response 1)

[n=80] Caucasian (97%) Hispanic or Latino American Native (1%) Multiracial (1%) Other (1%)

Q8_B What ethnic/racial group do you identify with? (Response 2)

[n=3] Hispanic or Latino American Native (67%) Other (33%)

Q8_TOTAL What ethnic/racial group do you identify with?

[n=83] Caucasian (93%) Hispanic or Latino American Native (4%) Multiracial (1%) Other (2%)

Q8_TEXT Please specify (other)

[n=2] European (1) American (1)

Q9_A Primary language spoken at home – English [n=85]

Q9_B Primary language spoken at home – Other [n=4]

Q9_TEXT Please specify (other language)

[n=4] German (1) Hebrew (3)

Q10_A How old is the child you participated with today (1st child)

[n=81] 1 year old (2%) 2 years old (6%) 3 years old (43%) 4 years old (24%) 5 years old (25%)

Q10_B How old is the child you participated with today (2nd child)

[n=14] 3 years old (22%) 4 years old (7%) 5 years old (57%) Older than 5 (14%)

Q11_TEXT If you live locally, what school(s) does your child/do your children attend?

[n=46] Please see sub-appendix A for full responses.

Q12_TEXT – email address for follow-up questionnaire

Sub-Appendix A

Q3_TEXT Describe what aspect of today's program was most engaging for your child (by program and date). All feedback listed is for Earth Keepers unless specified: Nature Tykes (NT) Scenic Storytime (SS)

| | | |
|---|--|--|
| <p>6/15/15 Everything was very interactive which pulled the children in to discuss & do Art projects & hiking NATURE Just being part of a group. It was our first time with a structured activity The scavenger hunt. Teacher was super encouraging of everyone Crafts, collecting stuff</p> <p>6/19/15 Being outdoors/craft Being outdoors collecting items and then using materials to make a craft</p> <p>6/22/15 Story, magnifying (glass), the activities were short and engaging, they kept the kids attention The program raised his curiosity level Reading story (according to him), acting out ant parts/game</p> <p>6/26/15 Great one-on-one experience since we were the only ones in the class! My little boy is shy so it was great to see him open up and talk lots with the instructor</p> <p>6/29/15 Everything Being the animals and acting out the life cycle. Collecting things outside Anything with animals, especially outside lab. Visual learner/repeating aloud of terms</p> <p>7/03/15 Outdoor time Group activity indoors and outdoor. Arts and crafts. Craft and the hike Art project and "netting" insects in the pond! Being a seed and flying around and then growing</p> <p>7/05/15 Succession of different plan topics (SS)</p> <p>7/06/15 Games and crafts Craft, songs Touching pine needles, song Games</p> <p>7/09/15 She was touching the different</p> | <p>7/10/15 The other children. He turned 3 on 2 July and is not in preschool/day care yet – so the socializing with peers was both go and encouraging him and was greatly enjoyed. Thanks! The crafts, hike and songs Examples of how trees help people</p> <p>7/13/15 The kids really engaged the hands-on experience from Butterfly Pavilion Crafts and touching bugs</p> <p>7/17/15 Every aspect was engaging-craft explanation, outdoor exploration Using the magnifying glass to look at bugs Looking at pollen and bees (other insects) and plants with magnifying glass</p> <p>7/20/15 Hands-on pond and stream water bugs Crafts, finding insets Going to the stream/pond and looking for critters Catching bugs, craft (bug headbands) Insect catching and observations. Excellent.</p> <p>7/24/15 Getting samples of water and looking at aquatic insects</p> <p>7/26/15 Nature walk – talking about different flowers (SS)</p> <p>7/27/15 Turning over logs on the nature work FBI – fungus, bacteria, invertebrates Hands-on, looking at pictures of FBI, craft</p> <p>7/30/15 The walk and the instruments (NT)</p> <p>7/31/15 Outside – looking under logs, finding decomposers The hike outside and acting out being a worm Walking outside and seeing and talking based on topic</p> <p>8/03/15 Nature walk Story and hike</p> | <p>8/06/15 The instruments kept her attention the longest Music making and walking, touching items on listening walk Playing instruments</p> <p>8/07/15 (Q3_4 – not yet!) The story, the craft, and the outdoor activity The nature walk, looking for flying animals</p> <p>8/10/15 Making crafts Emily – the kids love her Emily is the most engaging teacher we've had in the last two years Interactive water cycle song and demo. Lightening game</p> <p>8/13/15 She loved the puppet story and art (NT)</p> <p>8/14/15 She loved the art projects All of it! Making clouds and rain</p> <p>8/17/15 Outdoor activity, art project Emily – the kids love her! Interactive activities</p> <p>9/11/15 Creating fall tree Outdoor collecting Leaf rubbing and gluing leaves on the tree Outdoor activities, interactive activities</p> <p>9/25/15 It was all very appropriate for the mixed ages. Great activities and subject – camouflage Outdoor games Original book with camo Loved the games! I thought that finding the animals that were hiding in the pictures was great too ALL</p> |
|---|--|--|

| | | |
|---|---|--|
| <p>components. She was very interested in exploring outside the activity area. (NT)</p> | <p>Story, art project, observation hike Story/pictures time, walk around the pond</p> | |
|---|---|--|

Q4_TEXT How could this program be improved to meet you/your family’s expectations? (by program and date). All feedback listed is for EarthKeepers unless specified: Nature Tykes (NT) Scenic Storytime (SS).

| | |
|--|---|
| <p>6/15/15 Not sure what vocab was used/learned It was a great program, nothing needs to be changed Loved it as is</p> <p>6/19/15 Perhaps a longer outdoor experience and more details on habitat unique to Colorado</p> <p>6/22/15 Add more magnifying glasses (kinds don’t like to share) Awesome – so much fun!</p> <p>6/29/15 Need higher parent expectations – come on time, control your child if interfering with others learning Emphasize environmental impacts of pollution on watershed – especially here at headwaters</p> <p>7/03/15 Something for younger kid while here. More outside time less indoors. All good</p> <p>7/05/15 A little more examples in nature (natural world) (SS)</p> <p>7/06/15 Maybe more interactive learning and less lecture It was good, my child is a bit young for the 2 hours</p> <p>7/09/15 It was perfect (NT)</p> <p>7/10/15 No idea, it was wonderful!</p> <p>7/17/15 Our family loves this program. Using actual vocabulary is so appreciated and promotes vocabulary expansion in young children. I don’t know how you do it.</p> | <p>7/20/15 Questions could be more focused This was the largest group of kids I’ve seen at this program (usually 4-5, this was 9+) → it was harder for the kids to focus I think it would be great if the lecture portion was shorter and focused on fewer concepts. The kids get squirrely during the lecture portion</p> <p>7/27/15 They said “we wanted to see the snakes again.”</p> <p>7/31/15 Found it to be very good for this age – no suggestions</p> <p>8/03/15 Having kids raise their hands, think about answer in their heads and then calling on those that don’t always share. I just have a quiet kid – has lots to say but gets drowned out. Have parents control their kids if they don’t behave The game was too advanced 3 year olds – better for the older kids</p> <p>8/06/15 Introduce more tactile w/sound</p> <p>8/07/15 To immediate suggestions, program was great fun</p> <p>8/10/15 More teachers like Emily. Everything is great. Emily definitely makes the program more awesome than it already was.</p> <p>8/13/15 It’s great!</p> <p>8/17/15 Bring back Emily next year! We love her and the program. Sometimes a bit too advanced for the age group</p> <p>9/25/15 Children that cannot participate are disruptive to the group – maybe they should not be allowed??</p> |
|--|---|

Q5_TEXT Where are you and your family visiting us from today? (city, state) [n=82]

| | |
|-----------------------|---|
| <p>By City [n=81]</p> | <p>By State [n=82] – one person did not specify a city, just state (MO)</p> |
|-----------------------|---|

| | |
|------------------------|----------------------|
| Anaheim, CA [n=1] | Arizona [n=2] |
| Arvada, CO [n=3] | California [n=1] |
| Atlanta, GA [n=2] | Colorado [n=60] |
| Austin, TX [n=1] | Florida [n=1] |
| Avon, CO [n=17] | Georgia [n=2] |
| Beaver Creek, CO [n=1] | Iowa [n=1] |
| Canton, OH [n=1] | Missouri [n=2] |
| Chandler, AZ [n=2] | Nebraska [n=1] |
| Charlotte, NC [n=1] | North Carolina [n=1] |
| Columbus, OH [n=1] | Ohio [n=2] |
| Dallas, TX [n=2] | Oklahoma [n=3] |
| Denver, CO [n=6] | Texas [n=5] |
| Des Moines, IA [n=1] | |
| Eagle, CO [n=10] | |
| Edwards, CO [n=3] | |
| Erie, CO [n=1] | |
| Fort Collins, CO [n=1] | |
| Frisco, TX [n=1] | |
| Kansas City, MO [n=1] | |
| Leadville, CO [n=5] | |
| Live here/local [n=2] | |
| Minturn, CO [n=2] | |
| Omaha, NE [n=1] | |
| Round Rock, TX [n=1] | |
| St. Louis, MO [n=1] | |
| Superior, CO [n=1] | |
| Tampa, FL [n=1] | |
| Tulsa, OK [n=3] | |
| Vail, CO [n=6] | |
| Wolcott, CO [n=2] | |

Q7_ALL How did you hear about today’s program? [n=88]

| | |
|--|--|
| <p>Email from Walking Mountains (7%) Vail Daily (7%) Parent’s Handbook (3%) WhatToDo (7%) Brochure (5%) TV8 Vail (1%) Internet Search (9%) Walkingmountains.org (16%) Vail.com (1%) My child attended a school program (2%) Recommended by a friend (22%) Other (20%)</p> | <p>No families indicated they used the following (from provided options on questionnaire):</p> <p>Vail.net Vail Rec District VVP (Vail Valley Partnership) VCBA (Vail Chamber & Business Association)</p> |
|--|--|

Q7_TEXT Please specify (what other way did you hear about today’s program). All feedback listed is for EarthKeepers unless specified: Nature Tykes (NT) Scenic Storytime (SS).

| | |
|---|---|
| <p>6/15/15 Local 7/03/15 Coming here Friends work at WM 7/05/15 Events Avon Website (SS) 7/10/15 Vail 4th of July Parade 7/20/15 We have a home in Wildridge and have drive by 7/26/15 Vail calendar website (SS) 8/03/15 Local</p> | <p>8/10/15 We live here Local 8/14/15 Parent set it up 8/17/15 Local 9/11/15 Been coming for three years Second time 9/25/15 Vail Nature Center (2) Daughter owns Bookwork</p> |
|---|---|

Q11_TEXT If you live locally, what school(s) does your child/do your children attend?

| | |
|--|--|
| <p>AES [n=1] Children’s Garden of Learning [n=3] Daycare Y.E.S. in Eagle [n=2] E.V.E.S. [n=4] Homeschool [n=4] Kiddie Korral Preschool (soon to Sunshine Mtn. Preschool) [n=1] Lake County [n=2] Montessori [n=1] Montessori-Edwards [n=2] Mountain Montessori/ECCA [n=1] N/A [n=5] Not yet in school [n=2]</p> | <p>Pitts Elementary, Leadville [n=1] Pooh Corner [n=3] Prater Lane [n=6] Pre-k in Leadville [n=1] Preschool [n=1] Red Sandstone [n=2] Rumpelstilskin Preschool [n=3] St. Mary’s Preschool [n=1] The Center Early Childhood [n=1] Vail Child Care Center [n=1] Vail Christian Preschool [n=1] West Park Elementary School, Leadville [n=1]</p> |
|--|--|

IX. Program Retention Questionnaire Full Write-Up for Earth Keepers – All Responses

Program Retention Questionnaire Responses – Earth Keepers Program
1-month responses and 6-month responses

Q1_1 My child has expressed interest in doing other programs with Walking Mountains Science Center

1-month: [n=4] 2(25%) Strongly Agree (75%)

6-month: [n=6] Unsure (50%) 4 (17%) Strongly Agree (33%)

Q1_2 My child has been using the vocabulary introduced during the program

1-month: [n=5] Strongly Disagree (20%) Strongly Agree (80%)

6-month: [n=6] 2 (17%) 4 (17%) Strongly Agree (66%)

Q1_3 My child makes observations about his/her surroundings while outdoors

1-month: [n=6] Strongly Disagree (17%) 4 (17%) Strongly Agree (66%)

6-month: [n=5] 4 (40%) Strongly Agree (60%)

Q1_4 My child asks questions about his/her surroundings while outdoors

1-month: [n=6] Strongly Disagree (17%) 2 (17%) Strongly Agree (66%)

6-month: [n=5] 4 (40%) Strongly Agree (60%)

Q2_1 I have incorporated more stewardship behaviors into our household since participating in the program

1-month: [n=4] Strongly Disagree (25%) 4 (75%)

6-month: [n=5] 2 (20%) 4 (80%)

Q2_2 I have incorporated the vocabulary and concepts from the program into conversations with my child

1-month: [n=4] 4 (50%) Strongly Agree (50%)

6-month: [n=5] Unsure (20%) 4 (20%) Strongly Agree (60%)

Q2_3 I have encouraged my child to explore the outdoors more since participating in the program

1-month: [n=4] Strongly Disagree (25%) 2 (25%) Unsure (25%) Strongly Agree (25%)

6-month: [n=6] Unsure (33%) 4 (50%) Strongly Agree (17%)

Q2_4 My family and I have gone on at least one family hike since participating in the program

1-month: [n=4] Strongly Disagree (25%) 2 (25%) Strongly Agree (50%)

6-month: [n=4] Strongly Disagree (25%) 2 (25%) Strongly Agree (50%)

Q2_5 I plan to participate in another Walking Mountains Science Center Program

1-month: [n=4] Strongly Agree (100%)

6-month: [n=5] Strongly Agree (100%)

Q2_6 I have recommended the Walking Mountains Science Center to others

1-month: [n=4] Strongly Agree (100%)

6-month: [n=5] 4 (20%) Strongly Agree (100%)

Q3_TEXT If you child or your family has not spent more time exploring the outdoors since participating in a Walking Mountains Science Center program, why not?

Q4 During your Walking Mountains Science Center visit, were you: A resident of Eagle or Not a resident of Eagle County?

1-month: [n=5] A resident of Eagle County (60%) Not a resident of Eagle County (40%)

6-month: [n=6] A resident of Eagle County (83%) Not a resident of Eagle County (17%)

Q5 Have you attended any of our other programs since participating last month?

1-month: [n=5] Yes (20%) No (80%)

6-month: [n=6] Yes (17%) No (83%)

Q5_TEXT Please specify which programs or Why Not

1-month: [n=4]

Specify which programs:

We do the same program every Monday

Why not:

I am in Leadville and it is a long way to drive

We often visit and play but my child is only 3 so the other programs are above his level

We live out of town. If we lived in town we would definitely participate in more programs and if we go back to the area for a visit will look up what events are available while we are there

6-month: [n=3]

Specify which programs:

Earth Keepers

Why not:

We are part-time residents and usually only participate in summer programs

It's hard to get two young children out the door and to Avon in time for the program. We live in Eagle.

Q6_TEXT Is there anything else you would like to share with us?

1-month: [n=3]

We love it there. Please keep up the excellent work

Emily is awesome!

What is the next program for children entering kindergarten?

6-month: [n=4]

The program is wonderful! Sometimes it was a little too advanced for such young kids. I would often prep my child in advance so he would know a little bit of the vocabulary, etc. beforehand.

I'd love to see more offerings for young children in Eagle!

Just that I would love more programs on the calendar :)

We love it!!

Q7 Email address

X. Program Retention Questionnaire Comparison for Earth Keepers – 1-month response families and 6-month response families

**Comparison Frequencies of Question Comparisons (Post Program and Program Retention)
1-month and 6-month responses - Earth Keepers Program
Frequencies run on four collapsed response values**

Post Program: My child started using some of the new words introduced during the program

Program Retention: My child has been using the vocabulary introduced during the program

1-month: [n=6] 1 (16%) 2 (17%) 3 (17%) 4 (50%)

6-month: [n=6] 1 (20%) 4 (80%)

Post Program: My child made and shared observations during today's program

Program Retention: My child makes observations about his/her surroundings while outdoors

1-month: [n=6] 3 (17%) 4 (83%)

6-month: [n=6] 3 (20%) 4 (80%)

Post Program: My child asks questions about the concepts discussed in today's program

Program Retention: My child asks questions about his/her surroundings while outdoors

1-month: [n=6] 1 (16%) 2 (17%) 3 (17%) 4 (50%)

6-month: [n=6] 2 (20%) 3 (20%) 4 (60%)

Post Program: I have a better understanding of stewardship behavior as a result of participating today

Program Retention: I have incorporated more stewardship behaviors into our household since participating in the program

1-month: [n=6] 2 (17%) 3 (50%) 4 (33%)

6-month: [n=6] 3 (20%) 4 (80%)

Post Program: I plan on using the vocabulary introduced in today's program with my child.

Program Retention: I have incorporated the vocabulary and concepts from the program into conversations with my child

1-month: [n=6] 3 (33%) 4 (67%)

6-month: [n=6] 3 (40%) 4 (60%)

Post Program: As a result of today's program, I am more likely to encourage my child to play outdoors

Program Retention: I have encouraged my child to explore the outdoors more since participating in the program

1-month: [n=6] 3 (83%) 4 (17%)

6-month: [n=6] 2 (20%) 3 (20%) 4 (60%)

Post Program: Based on today's experience, I will recommend this program to other families
Program Retention: I have recommended the Walking Mountains Science Center to others

1-month: [n=6] 1 (17%) 3 (17%) 4 (66%)

6-month: [n=6] 3 (20%) 4 (80%)

XI. NAAEE Early Childhood Environmental Education Programs: Guidelines for Excellence Alignments

Full Guidelines: https://naaee.org/sites/default/files/gl_early_childhood_complete.pdf

Through these guidelines, there are more guidelines and behaviors available to incorporate into the curriculum and program experience to strengthen early childhood environmental education connections. The guidelines also provide information on common barriers, special needs accommodations, and encouraging investigation, among many others. Information and recommendations for best practices can be found throughout the guidelines in highlighted boxes.

Key Characteristic 1: Program Philosophy, Purpose, and Development

- *Guideline 1.6 – Ongoing Evaluation and Assessment:* The early childhood environmental education program has an evaluation and assessment plan that is instrumental to teaching and learning, program, and facility improvement.
 - Overall program goals are reviewed and revised on a regular basis with participation by parents, caregivers, and community and staff members
 - Learning objectives for programs are reviewed and revised on a regular basis
 - Site facilities are reviewed and appropriate maintenance performed

Key Characteristic 2: Developmentally Appropriate Practices

- *Guideline 2.1 – Based on Research and Theory:* Early childhood environmental educators understand and apply appropriate research and learning theory.
 - Early childhood educators are knowledgeable about educational theories and theorists that support developmentally appropriate practice, including the works of theorists such as Dewey, Piaget, Vygotsky, Montessori, Erickson, Gardner, Steiner, and the Reggio Emilia founders (Appendix D in full guidelines)
 - Learning activities are designed to accommodate all children
 - Children are provided with structured and unstructured opportunities for social interaction with other children and with adults
- *Guideline 2.2 – Authentic Experiences:* The developmentally appropriate program responds to children’s needs to explore, discover, and discuss their experiences in the environment.
 - Opportunities for exploring, respecting, and experimenting in nature are provided
 - Opportunities are provided for children to experience the different elements of the outdoors – textures, sounds, tastes, smells, and sights – on a regular basis
 - Tools and materials that the child can use to view the environment in different ways are provided. Examples include the magnifying glass, clear containers for viewing insects up close, or a viewfinder.
- *Guideline 2.3 – Child-Directed and Inquiry-Based:* The developmentally appropriate program is child-directed and inquiry-based.
 - Open-ended activities, choice, and hands-on learning focusing on process are provided
 - Taking materials outdoors or bringing natural materials inside to extend learning is integral to the program
- *Guideline 2.4 – The Whole Child:* The developmentally appropriate program is planned with the whole child in mind.
 - Educators establish a schedule and curriculum with preplanned activities that structure nature into all curricular areas, as well as meals and nap time, while maintaining flexibility to take advantage of teachable moments or the unplanned direction that children’s curiosity will take you as you follow their lead

- Educators plan and provide activities that are focused on specific outcomes from a variety of developmental domains
- Educators encourage curiosity about and joy in nature

Key Characteristic 3: Play and Exploration

- *Guideline 3.1 – Use of the Natural World and Natural Materials:* The natural world provides unlimited potential for play and exploration activities that will benefit the child’s development
 - Opportunities for gross and fine motor development are provided
 - Use of natural materials in indoor settings is encouraged to complement outdoor play and exploration
 - Recycled materials for play and exploration are provided
 - Supplies, materials, language, ideas, and emotional support are provided that encourage discovery, and time is allowed for investigation
 - Group projects and activities are promoted to nurture curiosity, problem-solving skills, and discovery among children
- *Guideline 3.2 – Play and the Role of Adults:* Adults, including formal and non-formal educators, parents, and caregivers, provide the context and supervision that maximizes the learning and development possibilities from play and exploration.
 - Time is allowed for investigation, exploration, creativity, and discovery
 - The standards of developmentally appropriate practice are actively considered and employed

Key Characteristic 4: Curriculum Framework and Environmental Learning

- *Guideline 4.2 – Curiosity and Questioning*
 - Initiative and curiosity are encouraged, so that children may:
 - Explore a range of natural materials using their senses
 - Choose to participate in an increasing array of environmental explorations
 - Approach environmental explorations with increased flexibility, imagination, and inventiveness
 - Experience surprise and delight through their environmental explorations
 - Develop a curiosity about cause, life cycle, and reasoning
 - Questioning for children to practice reasoning and problem-solving are provided so they may:
 - Ask questions about environmental components and phenomena
 - Discuss or document through drawing or writing what is learned through environmental investigations and explorations
- *Guideline 4.3 – Development of Environmental Understandings:* As children explore their environment, they begin to develop understandings of how the world works. Early learning programs provide children with opportunities to develop knowledge related to environmental and social systems, including the place where they live.
 - Opportunities to observe and understand earth systems are provided so children may:
 - Investigate properties of rocks, soil, and water
 - Learn and understand the importance of natural resources and that the environment provides for the needs of people
 - Notice and describe local environmental changes such as erosion and water flow
 - Opportunities are provided to observe and understand the living environment so children may:
 - Understand the nature of life through interactions with a variety of plants, animals, and fungi
 - Understand that plants and animals have life cycles
 - Notice and ask questions about growth and change in plants and animals, such as a caterpillar changing into a butterfly
 - Interactions with individuals, groups, and culture are provided so children may:
 - Be aware of his or her role as a member of a group, such as the family or the class

- An emphasis on developing the child's sense of place is included so that children may:
 - Become aware of characteristics of the place where they live and of other places
- *Guideline 4.4 – Skills for Understanding the Environment:* Young children increasingly develop their ability to investigate, analyze, and respond to environmental changes, situations and concerns. Early learning programs provide opportunities for children to experience a variety of environmental conditions and encourage them to investigate topics of their own choosing. These investigations may, when appropriate, lead to the development of action strategies.
 - Opportunities for children to observe, investigate, and analyze are provided so that they may:
 - Use their senses to observe their environment and notice changes
 - Opportunities are provided that help children develop abilities to collect, describe, and record information, so children may:
 - Collect a variety of information using tools such as tweezers, jars, cameras, paper, and drawing
- *Guideline 4.5 – A Personal Sense of Responsibility and Caring:* As young children develop empathy and increased self-reliance, they demonstrate a sense of personal responsibility toward others and their environment. Early learning programs model environmentally responsible actions and provide opportunities for children to make decisions about their own activities
 - Opportunities are provided for extensive positive interactions with nature, so that children may:
 - Investigate and understand their personal place in the world
 - Communicate feels about their place and the local environment

Key Characteristic 5: Places and Spaces

- *Guideline 5.1 – Spaces and Places to Enhance Development:* Indoor and outdoor places and spaces provide opportunities for development across social, emotional, physical, and cognitive development domains.
 - A variety of sensory experiences – textures, sounds, tastes, smells, and sights – are included in the child's experience
 - Physical spaces used and their associated programs encourage a respect for nature and living things
- *Guideline 5.3 – Comfortable for both Children and Adults:* Comfortable and inviting places and spaces are necessary for learning and development to occur. Without a sense of comfort, it is very difficult for adults and children to benefit from an experience
 - Individual and group gathering areas are included
 - Sufficient seating for adults and children are provided
 - Places feel safe and are obviously accessible and inviting

Key Characteristic 6: Educator Preparation

This entire section could be utilized in the naturalist trainings held in May before the summer season begins to help strengthen naturalist education and knowledge and connections to environmental education, which in turn would help strengthen the overall quality of the programs.

XII. Revised Post Program Questionnaire
Thank you for participating in our program today!

Your responses will be used to improve this and other programs presented by Walking Mountains Science Center.

Today's date: _____

Which program did you participate in today? *Circle one.* Earth Keepers / Nature Tykes / Scenic Storytime

How strongly do you agree or disagree with the following questions based on **your child's experience** today?

| <i>Circle one for each question</i> | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree | N/A |
|---|-------------------|---|---|---|---|---|----------------|-----|
| My child enjoyed the activities in today's program. | 1 | 2 | 3 | 4 | 5 | | | N/A |
| My child started using some of the new words introduced during the program. | 1 | 2 | 3 | 4 | 5 | | | N/A |
| My child made and shared observations during today's program. | 1 | 2 | 3 | 4 | 5 | | | N/A |
| My child asked questions about the concepts discussed in today's program. | 1 | 2 | 3 | 4 | 5 | | | N/A |

Describe what aspect of today's program was most engaging for your child.

How strongly do you agree or disagree with the following questions based on **your experience** today?

| <i>Circle one for each question</i> | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree | N/A |
|---|-------------------|---|---|---|---|---|----------------|-----|
| The instructor was easy to hear and understand. | 1 | 2 | 3 | 4 | 5 | | | N/A |
| I have a better understanding of stewardship behavior as a result of participating today. | 1 | 2 | 3 | 4 | 5 | | | N/A |
| I plan on using the vocabulary and concepts introduced in today's program with my child. | 1 | 2 | 3 | 4 | 5 | | | N/A |
| As a result of today's program, I am more likely to encourage my child to play outdoors. | 1 | 2 | 3 | 4 | 5 | | | N/A |
| Based on today's experience, I will recommend this program to other families. | 1 | 2 | 3 | 4 | 5 | | | N/A |

How could this program be improved to meet your/your family's expectations?

Where are you and your family visiting us from today? (*city, state*) _____

Have any members of your family attended programs at Walking Mountains Science Center before?

_____ Yes. *Please specify which programs:* _____
_____ No.

How did you hear about today’s program (EarthKeepers, Nature Tykes or Scenic Storytime)?

- | | | |
|--|---|---|
| <input type="checkbox"/> Email from Walking Mountains Science Center | <input type="checkbox"/> TV8 Vail | <input type="checkbox"/> VVP (Vail Valley Partnership) |
| <input type="checkbox"/> Vail Daily | <input type="checkbox"/> Internet Search | <input type="checkbox"/> VCBA (Vail Chamber & Business Association) |
| <input type="checkbox"/> Parent’s Handbook | <input type="checkbox"/> Walkingmountains.org | <input type="checkbox"/> My child attended a school program |
| <input type="checkbox"/> WhatToDo | <input type="checkbox"/> Vail.net | <input type="checkbox"/> Recommended by a friend |
| <input type="checkbox"/> Brochure | <input type="checkbox"/> Vail.com | <input type="checkbox"/> Other, <i>specify:</i> _____ |
| | <input type="checkbox"/> Vail Rec District | |

What ethnic/racial group do you identify with?

- | | |
|---|--|
| <input type="checkbox"/> American Indian or Alaska Native | <input type="checkbox"/> Hispanic or Latino American Native |
| <input type="checkbox"/> Asian | <input type="checkbox"/> Native Hawaiian or Other Pacific Islander |
| <input type="checkbox"/> Black or African | <input type="checkbox"/> Multiracial |
| <input type="checkbox"/> Caucasian | <input type="checkbox"/> Other, <i>specify:</i> _____ |

What language(s) do you primarily speak at home?

- English Other, *language(s):* _____

How old is the child (or children) you participated with today?

Child 1:
 < 1 year old 1 2 3 4 5 Older than 5

Child 2:
 < 1 year old 1 2 3 4 5 Older than 5

If you live locally, what school(s) does your child/do your children attend?

School(s): _____

May we contact you via email in about a month to learn how this program may have further benefitted you?

If yes, please **LEGIBLY PRINT** your email address below, even if you have separately signed up for Walking Mountains promotional emails. Your email will not be associated with your responses or used for any other purpose and is critical to enabling us to match your responses at the end of this program with ones provided in the future.

Email address _____

XIII. Revised Program Retention Questionnaire

Thank you for participating in *Earth Keepers last month!**

*Change for each program's questionnaire

Your responses to the following questions will help us continue to make improvements to this program as well as other programs presented by Walking Mountains Science Center.

How strongly do you agree or disagree with the following questions, based on **your child's participation** in our program last month?

| <i>Circle one for each question</i> | Strongly Disagree | | Unsure | | Strongly Agree | |
|---|----------------------|---|--------|---|-------------------|-----|
| My child has expressed interest in doing other programs with Walking Mountains Science Center | 1 | 2 | 3 | 4 | 5 | N/A |
| My child has been using the vocabulary introduced during the program. | 1 | 2 | 3 | 4 | 5 | N/A |
| My child makes observations about his/her surroundings while outdoors. | 1 | 2 | 3 | 4 | 5 | N/A |
| My child asks questions about his/her surroundings while outdoors. | 1 | 2 | 3 | 4 | 5 | N/A |

How strongly do you agree or disagree with the following questions, based on **your participation** in our program last month?

| <i>Circle one for each question</i> | Strongly Disagree | | Unsure | | Strongly Agree | |
|---|----------------------|---|--------|---|-------------------|-----|
| I have incorporated more stewardship behaviors into our household since participating in the program. | 1 | 2 | 3 | 4 | 5 | N/A |
| I have incorporated the vocabulary and concepts from the program into conversations with my child. | 1 | 2 | 3 | 4 | 5 | N/A |
| I have encouraged my child to explore the outdoors more since participating in the program. | 1 | 2 | 3 | 4 | 5 | N/A |
| My family and I have gone on at least one family hike since participating in the program. | 1 | 2 | 3 | 4 | 5 | N/A |
| I plan to participate in another Walking Mountains Science Center program. | 1 | 2 | 3 | 4 | 5 | N/A |
| I have recommended the Walking Mountains Science Center to others. | 1 | 2 | 3 | 4 | 5 | N/A |

If your child or your family has not spent more time exploring the outdoors since participating in a Walking Mountains Science Center program, why not:

During your Walking Mountains Science Center visit, were you:

- A resident of Eagle County.
- Not a resident of Eagle County.

Have you attended any of our other programs since participating last month?

- Yes. *Please specify which programs:* _____
- No. *Why not:* _____

Is there anything else you would like to share with us?

Please provide us with the email address through which you were asked to complete this survey so that we can compare your responses in this questionnaire with those you shared immediately after our program. Your email will not be associated with your responses and will not be used for any other purpose except to match your responses.

Email address: _____

XIV. Training manual

**Walking Mountains Science Center
Training Manual for Early Childhood Programs Evaluation System**

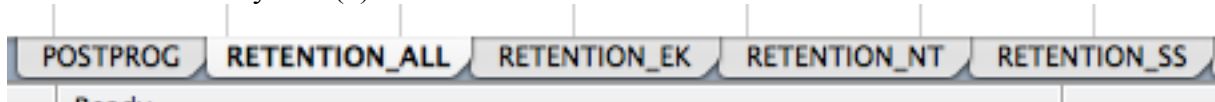
Created by: Nicole Muench

Purpose:

This training manual provides detailed instructions for data collection, entry and analysis for the three Early Childhood Programs that Walking Mountains Science Center (WMSC) offers: Earth Keepers, Nature Tykes, and Scenic Storytime. This manual is designed to enable any staff member of WMSC to enter data from the post program and program retention questionnaires and preliminary descriptive results via a programmed Excel workbook.

Included in this document are the following:

- Questions and their corresponding code used in the Excel workbook from both questionnaires
 - For each question, there are additional bullet point notes that may prove useful when entering data from the paper questionnaires in order to make the data analysis component easier
 - At the beginning of each questionnaire, there are “Helpful Tips” that are specific to that questionnaire
- The Excel workbook as been set up so that data entry can be started immediately
 - The workbook includes multiple tabs:
 - Instructions
 - POSTPROG (Post Program responses, all programs)
 - RETENTION_ALL (Program Retention responses, all programs)
 - RETENTION_EK (Program Retention responses, Earth Keepers)
 - RETENTION_NT (Program Retention responses, Nature Tykes)
 - RETENTION_SS (Program Retention responses, Scenic Storytime)
 - Calculations for the program retention responses can be done individually by program OR all combined like the post program results (RETENTION_ALL vs. RETENTION_EK/NT/SS)
 - For the retention tabs, the data can either be copied/pasted into the work book from the Google Forms responses, or the files can be downloaded and the formulas could applied to the downloaded spreadsheets by following the instructions included in this guide
 - Note: If the Google Forms are downloaded and the formulas applied, the preliminary descriptive analysis would be separate for each program
 - Templates for data analysis are at the far right of all data columns within each tab.
- IMPORTANT for Retention tabs:
 - Q_TS on the retention tabs refers to the timestamp column in the Google Forms. Again, this can be included if the data are copied and pasted into the columns from the Google Form, just be aware of column alignment if you do not include the timestamp.
 - Q0 on the RETENTION_ALL tab refers to the program and response value assigned for each program. This number will need to be manually entered into the spreadsheet to correspond with the correct data from the Google Forms: Earth Keepers (1), Nature Tykes (2), and Scenic Storytime (3)



Instructions - creating the data set for the Post Program Analysis

1. Open the Excel workbook, titled: WMSC_Workbook.xls
2. Select the tab labeled POSTPROG
3. Each questionnaire completed by a family will represent one row in the workbook
4. Enter the data from the responses based on the coding suggestions provided below in the training manual
5. Once the first row of data has been entered, follow the instructions below on calculating frequencies
 - a. This could not be set up ahead of time, as there was no data within the sheet to analyze

Instructions – calculating frequencies for numeric response questions (both questionnaires)

1. For every question on either questionnaire that has numeric values as response, there will be a template set up as you see below.
 - a. The frequency calculation will ignore blank and/or text responses that are in the columns
2. The numbers 1-5 below the question code represent the possible responses for that specific question, which will be used in the frequency calculation.
 - a. Most questions have 1-5 as possible responses, although a few questions will have fewer/more options.
 - b. In Excel, these numbers are called the “bins” or “bins_array.”

| Q3_1 | Frequencies |
|------|-------------|
| | 1 |
| | 2 |
| | 3 |
| | 4 |
| | 5 |
| | |

3. To calculate frequencies, use the mouse to select the cells immediately next to the bins.
 - a. The yellow highlighter is mimicking the cell selection, you need to select all five so the green box appears around them

| Q3_1 | Frequencies |
|------|-------------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |

4. Next, start by typing the following:
 - a. =FREQUENCY(
 - i. This will appear in the top most cell you've selected
 - b. Next, select the "data_array," which is the column of data for which you want to calculate frequencies.
 - c. Select the entire column of data followed by a comma (",")
 - d. Without any spaces, select the "bins_array," which are the bins that are already listed
 - e. Close the parentheses but **do not hit enter**.

| Q3_1 | Frequencies |
|------|---------------------------|
| 1 | =frequency(C2:C93,H3: |
| 2 | H7) |
| 3 | |
| 4 | |
| 5 | |

5. To calculate the frequencies, you need to hold down CONTROL then SHIFT *before* you hit ENTER
 - a. Once you have done this, your table should look something like what you see below, where the total number of responses in each bin is listed under the Frequencies column.

| Q3_1 | Frequencies |
|------|-------------|
| 1 | 0 |
| 2 | 2 |
| 3 | 5 |
| 4 | 16 |
| 5 | 66 |
| | |
| | |

6. If you want to calculate the total responses for each question, you can do a sum calculation:

| Q3_1 | Frequencies |
|--------------|-------------|
| 1 | 0 |
| 2 | 2 |
| 3 | 5 |
| 4 | 16 |
| 5 | 66 |
| Total | =sum(I3:I7) |

| Q3_1 | Frequencies |
|--------------|-------------|
| 1 | 0 |
| 2 | 2 |
| 3 | 5 |
| 4 | 16 |
| 5 | 66 |
| Total | 89 |

7. Depending on how many rows you initially selected in the column of data, the frequencies and total number of responses should update as more data is entered in.

Instructions – calculating percentages for frequencies

1. Once you have the frequencies listed for each question, percentages can be calculated
 - a. Once these calculations have been set up the first time with data in the spreadsheet, there should not be a need to re-do them every time there is more data added
2. Calculate the fraction first, =(frequency)/(total)

| Frequencies | Percentage |
|-------------|------------|
| 0 | =J3/J8 |
| 2 | |
| 5 | |
| 16 | |
| 66 | |
| 89 | |

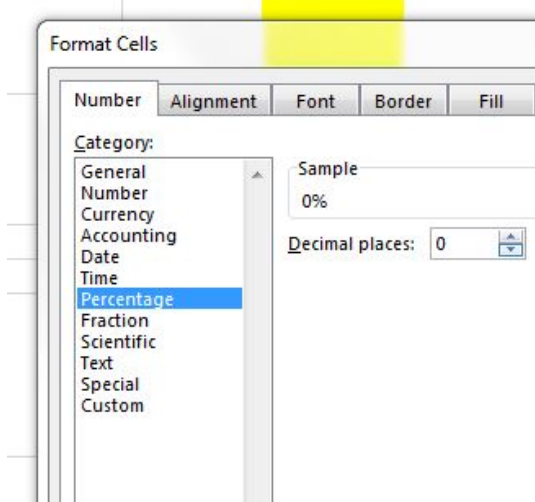
3. Complete this calculation for each of the frequencies

| Frequencies | Percentage |
|-------------|------------|
| 0 | 0 |
| 2 | =J4/J8 |
| 5 | |
| 16 | |
| 66 | |
| 89 | |

4. Once you have each of the fractions, highlight all the cells in the Percentage column (again, marked in highlighter below)

| Frequencies | Percentage | Frequencies | Percentage |
|-------------|------------|-------------|------------|
| 0 | 0 | 0 | 0 |
| 2 | 0.02247191 | 2 | 0.02247191 |
| 5 | 0.05617978 | 5 | 0.05617978 |
| 16 | 0.17977528 | 16 | 0.17977528 |
| 66 | 0.74157303 | 66 | 0.74157303 |
| 89 | | 89 | |

5. Right click on the selected cells and select “Format Cells”
6. Select the “Number” menu, then “Percentage” and change the Decimal Places to 0



7. Click “OK” at the bottom of the “Format Cells” menu.
8. Now as your frequencies are updated, the percentages will update too.

| Frequencies | Percentage |
|-------------|------------|
| 0 | 0% |
| 2 | 2% |
| 5 | 6% |
| 16 | 18% |
| 66 | 74% |
| 89 | |

Instructions – calculating means

1. A template for the question means has been created within each sheet of the workbook:

| MEANS | |
|-------|--|
| Q3_1 | |
| Q3_2 | |
| Q3_3 | |
| Q3_4 | |
| | |
| Q4_1 | |
| Q4_2 | |
| Q4_3 | |
| Q4_4 | |
| Q4_5 | |

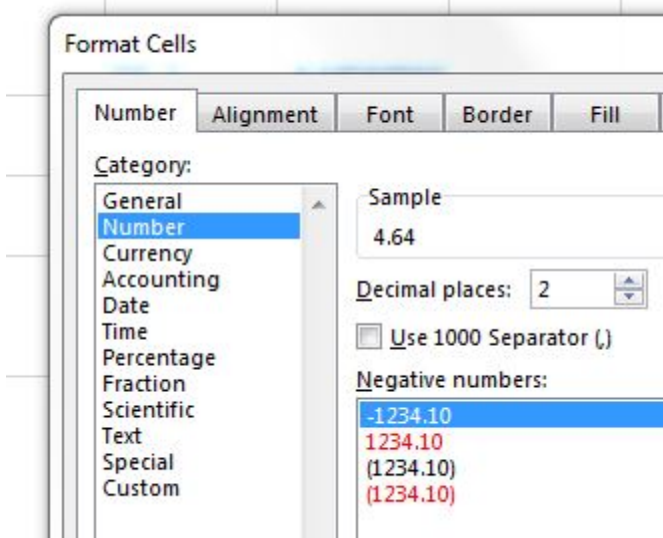
2. To calculate the mean, select the cell next to one of the question variables
3. Type: =AVERAGE(and select the entire column of data that corresponds to that question

| | | |
|------|-----------|---------|
| | | |
| | | |
| Q3_1 | =AVERAGE(| C2:C93) |

4. Close the parentheses and hit ENTER. The mean will have multiple decimal places, which can be simplified to two places, which was followed during the evaluation system creation.

| | | |
|------|------------|--|
| | | |
| | | |
| Q3_1 | 4.64044944 | |

5. Right click on the cell with the average and select “Format Cells”



6. Select the "Number" menu, select "Number" and enter 2 for "Decimal Places:" then click "OK."

| | |
|------|------|
| | |
| Q3_1 | 4.64 |

**Walking Mountains Science Center
Training Manual for Early Childhood Programs Evaluation System**

**Questions and Coding Guide for the Excel Workbook
Post Program Questionnaire**

Post Program Questionnaire Helpful Tips:

- Bolded code corresponds to a separate data entry column within the Excel Workbook
- Response options have a numeric code in parentheses, or are listed below the responses
- Open-ended questions labeled Q*_TEXT:
 - You can decide if you want to enter this information into the Excel spreadsheet or keep track of the responses in another location or type of document.
 - It may be useful/beneficial to look at feedback based on program date to better understand what about that specific day's program yielded the responses recorded, but not include it within the spreadsheet
- Several questions below offer specific insights into how to enter data into the Excel Workbook, especially for questions where families may have selected more than one response option (Q7 as an example)
 - Bulleted points are listed below each question to offer suggestions for what to do if more than one response option is selected
- Questions Q3_* through Q4_* all use the same scale of Strongly Disagree to Strongly Agree, and the numeric values for these options are listed as well.

Excel Code and Question

Q1 Today's date

July 7, 2015 could be entered as: 070715

- The program date wasn't specifically used in the analyses conducted, but it may be beneficial to enter it to see if there are themes in written feedback for a particular day's program.

Q2 Which program did you participate in today?

(1) Earth Keepers (2) Nature Tykes (3) Scenic Storytime

Q3_1 My child enjoyed the activities in today's program

Q3_2 My child started using some of the new words introduced during the program

Q3_3 My child made and shared observations during today's program

Q3_4 My child asked questions about the concepts discussed in today's program

Q3_TEXT Describe what aspect of today's program was most engaging for your child

Q4_1 The instructor was easy to hear and understand

Q4_2 I have a better understanding of stewardship behavior as a result of participating today

Q4_3 I plan on using the vocabulary and concepts introduced in today's program with my child

Q4_4 As a result of today's program, I am more likely to encourage my child to play outdoors

Q4_5 Based on today's experience, I will recommend this program to other families

| | | | | | | |
|-------------------|---|--------|---|----------------|-----|-------|
| Strongly Disagree | | Unsure | | Strongly Agree | N/A | Blank |
| 1 | 2 | 3 | 4 | 5 | | |

- N/A and Blank responses can be written into the data row, or just N/A can be written in to distinguish those responses from Blank responses. N/A and Blank responses will not be incorporated into the frequency calculation.

Q4_TEXT How could this program be improved to meet you/your family's expectations?

Q5_TEXT Where are you and your family visiting us from today? (city, state)

Q6 Have any members of your family attended programs at Walking Mountains Science Center before?

(1) Yes (2) No

Q6_TEXT Please specify which programs (if Yes to Q6)

Q7 How did you hear about today's program?

| | | |
|-----------------------|--------------------------|---|
| (1) Email from WMSC | (6) TV8 Vail | (12) VVP |
| (2) Vail Daily | (7) Internet Search | (13) VCBA |
| (3) Parent's Handbook | (8) Walkingmountains.org | (14) My child attended a school program |
| (4) WhatToDo | (9) Vail.net | (15) Recommended by a friend |
| (5) Brochure | (10) Vail.com | (16) Other, <i>specify</i> : |
| | (11) Vail Rec District | |

- During the pilot test, families marked between one and three response options when answering this question. The excel workbook has offered three columns for this question, should individuals include more than one response. These are labeled Q7_A, Q7_B and Q7_C.
- If a family only marks one response, list it in column Q7_A

Q7_TEXT Please specify (other)

Q8 What ethnic/racial group do you identify with?

| | |
|--------------------------------------|--|
| (1) American Indian or Alaska Native | (5) Hispanic or Latino American Native |
| (2) Asian | (6) Native Hawaiian or Other Pacific |
| (3) Black or African | (7) Multiracial |
| (4) Caucasian | (8) Other, <i>specify</i> : |

Q8_TEXT Please specify (other)

Q9 What language(s) do you primarily speak at home?

(1) English (2) Other, *language(s)*:

Q9_TEXT Please specify (other language)

Q10 How old is the child you participated with today?

[Q10_1] Child 1:

(1) <1 year old (2) 1 (3) 2 (4) 3 (5) (6) 5 (7) older than 5

[Q10_2] Child 2:

(1) <1 year old (2) 1 (3) 2 (4) 3 (5) (6) 5 (7) older than 5

Q11_TEXT If you live locally, what school(s) does your child/do your children attend?

Q12_TEXT – email address to receive program retention questionnaire in one month

**Walking Mountains Science Center
Training Manual for Early Childhood Programs Evaluation System**

**Questions and Coding Guide for the Excel Workbook
Program Retention Questionnaire**

Program Retention Questionnaire Helpful Tips:

- Currently, this questionnaire is separate for each program online, so there is no question asking which program the family participated in because they are getting a program-specific version of the questionnaire based on how they answered the first question on the post program questionnaire
 - If you want to combine the data to run analyses, use the same coding for the three programs: (1) Earth Keepers, (2) Nature Tykes, (3) Scenic Storytime
- Questions Q1_* through Q2_* all use the same scale of Strongly Disagree to Strongly Agree, and the numeric values are listed as well.
 - The N/A response within the Google Forms gets reported as 6. These should be manually changed back to NA, otherwise they will not accurately reflect the mean responses

Program Retention Excel Code and Question

Q_TS (Timestamp from Google Form responses)

Q1_1 My child has expressed interest in doing other programs with Walking Mountains Science Center

Q1_2 My child has been using the vocabulary introduced during the program

Q1_3 My child makes observations about his/her surroundings while outdoors

Q1_4 My child asks questions about his/her surroundings while outdoors

Q2_1 I have incorporated more stewardship behaviors into our household since participating in the program

Q2_2 I have incorporated the vocabulary and concepts from the program into conversations with my child

Q2_3 I have encouraged my child to explore the outdoors more since participating in the program

Q2_4 My family and I have gone on at least one family hike since participating in the program

Q2_5 I plan to participate in another Walking Mountains Science Center Program

Q2_6 I have recommended the Walking Mountains Science Center to others

| | | | | | | |
|-------------------|---|--------|---|----------------|-----|-------|
| Strongly Disagree | | Unsure | | Strongly Agree | N/A | Blank |
| 1 | 2 | 3 | 4 | 5 | | |

- N/A and Blank responses can be written into the data row, or just N/A can be written in to distinguish those responses from Blank responses. N/A and Blank responses will not be incorporated into the frequency calculation.

Q3_TEXT If you child or your family has not spent more time exploring the outdoors since participating in a Walking Mountains Science Center program, why not?

Q4 During your Walking Mountains Science Center visit, were you: A resident of Eagle or Not a resident of Eagle County?

- (1) A resident of Eagle County (2) Not a resident of Eagle County

Q5 Have you attended any of our other programs since participating last month?

- (1) Yes (2) No

Q5_TEXT Please specify which programs

- In the current version of the Google Form, families can answer this question if they responded Yes or No to question Q5.
- By keeping it in this format, you will need to see how the responded to Q5 in order to interpret their response to this question, should it be vague.

Q6_TEXT Is there anything else you would like to share with us?

Q7 Email address to match post program questionnaire responses

Walking Mountains Science Center Training Manual for Early Childhood Programs Evaluation System

Excel Workbook Templates

Table A. Screenshot of excel workbook - post program templates within POSTPROG sheet.

| MEANS | | | | | | | | | | | | |
|--------------------|-------------|------------|------------------|-------------|------------|--------------|-------------|------------|--------------|-------------|------------|-------------------|
| Q3_1 | | | | | | | | | | | | |
| Q3_2 | | | | | | | | | | | | |
| Q3_3 | | | | | | | | | | | | |
| Q3_4 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Q4_1 | | | | | | | | | | | | |
| Q4_2 | | | | | | | | | | | | |
| Q4_3 | | | | | | | | | | | | |
| Q4_4 | | | | | | | | | | | | |
| Q4_5 | | | | | | | | | | | | |
| FREQUENCIES | | | | | | | | | | | | |
| Q0 | Frequencies | Percentage | | | | | | | | | | |
| 1 | | | Earth Keepers | | | | | | | | | |
| 2 | | | Nature Tykes | | | | | | | | | |
| 3 | | | Scenic Storytime | | | | | | | | | |
| Total | | | | | | | | | | | | |
| Q3_1 | Frequencies | Percentage | Q3_2 | Frequencies | Percentage | Q3_3 | Frequencies | Percentage | Q3_4 | Frequencies | Percentage | |
| 1 | | | 1 | | | 1 | | | 1 | | | Strongly Disagree |
| 2 | | | 2 | | | 2 | | | 2 | | | |
| 3 | | | 3 | | | 3 | | | 3 | | | Unsure |
| 4 | | | 4 | | | 4 | | | 4 | | | |
| 5 | | | 5 | | | 5 | | | 5 | | | Strongly Agree |
| Total | | | Total | | | Total | | | Total | | | |
| Q4_1 | Frequencies | Percentage | Q4_1 | Frequencies | Percentage | Q4_1 | Frequencies | Percentage | Q4_1 | Frequencies | Percentage | |
| 1 | | | 1 | | | 1 | | | 1 | | | Strongly Disagree |
| 2 | | | 2 | | | 2 | | | 2 | | | |
| 3 | | | 3 | | | 3 | | | 3 | | | Unsure |
| 4 | | | 4 | | | 4 | | | 4 | | | |
| 5 | | | 5 | | | 5 | | | 5 | | | Strongly Agree |
| Total | | | Total | | | Total | | | Total | | | |

Table B. Screenshot of excel workbook - post program templates within POSTPROG sheet.

| Q6 | Frequencies | Percentage | |
|--------------|-------------|------------|-----|
| 1 | | | Yes |
| 2 | | | No |
| Total | | | |

| Q7* | Frequencies | Percentage | | Q8 | Frequencies | Percentage | | Q9 | Frequencies | Percentage | |
|--------------|-------------|------------|--|--------------|-------------|------------|--|--------------|-------------|------------|-----|
| 1 | | | | 1 | | | | 1 | | | Yes |
| 2 | | | | 2 | | | | 2 | | | No |
| 3 | | | | 3 | | | | Total | | | |
| 4 | | | | 4 | | | | | | | |
| 5 | | | | 5 | | | | | | | |
| 6 | | | | 6 | | | | | | | |
| 7 | | | | 7 | | | | | | | |
| 8 | | | | 8 | | | | | | | |
| 9 | | | | Total | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| Total | | | | | | | | | | | |

*Highlight data in columns of Q7_A, Q7_B, and Q7_C to get a full frequency calculation

| Q10** | Frequencies | Percentage | (Age) |
|--------------|-------------|------------|--------------|
| 1 | | | <1 year old |
| 2 | | | 1 |
| 3 | | | 2 |
| 4 | | | 3 |
| 5 | | | 4 |
| 6 | | | 5 |
| 7 | | | Older than 5 |
| Total | | | |

** Highlight data in columns of Q10_A and Q10_B to get a full frequency calculation

Table C. Screenshot of excel workbook – program retention templates within RETENTION_ALL, RETENTION_EK, RETENTION_NT, and RETENTION_SS sheets.

| | | | | | | | | | | | |
|-------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Means | | | | | | | | | | | |
| Q1_1 | | | | | | | | | | | |
| Q1_2 | | | | | | | | | | | |
| Q1_3 | | | | | | | | | | | |
| Q1_4 | | | | | | | | | | | |
| | | | | | | | | | | | |
| Q2_1 | | | | | | | | | | | |
| Q2_2 | | | | | | | | | | | |
| Q2_3 | | | | | | | | | | | |
| Q2_4 | | | | | | | | | | | |
| Q2_5 | | | | | | | | | | | |
| Q2_6 | | | | | | | | | | | |
| | | | | | | | | | | | |
| FREQUENCIES | | | | | | | | | | | |
| | | | | | | | | | | | |
| Q0 | | | | | | | | | | | |
| Frequencies Percentages | | | | | | | | | | | |
| 1 Earth Keepers | | | | | | | | | | | |
| 2 Nature Tykes | | | | | | | | | | | |
| 3 Scenic Storytime | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Q1_1 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Q1_2 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Q1_3 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Q1_4 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |

Table D. Screenshot of excel workbook - program retention templates within RETENTION_ALL, RETENTION_EK, RETENTION_NT, and RETENTION_SS sheets.

| | | | | | | | | | | | |
|------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Q2_1 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Q2_2 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Q2_3 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Q2_4 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Q2_5 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Q2_6 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Strongly Disagree | | | | | | | | | | | |
| | | | | | | | | | | | |
| Unsure | | | | | | | | | | | |
| | | | | | | | | | | | |
| Strongly Agree | | | | | | | | | | | |
| | | | | | | | | | | | |
| Q4 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 Resident | | | | | | | | | | | |
| 2 Non-Resident | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Q5 | | | | | | | | | | | |
| Frequencies Percentage | | | | | | | | | | | |
| 1 Yes | | | | | | | | | | | |
| 2 No | | | | | | | | | | | |
| Total | | | | | | | | | | | |

XV. IRB application

01. General Study Information

All questions marked with a red asterisk (*) require a response. Questions without a red asterisk may or may not require a response, depending on those questions' applicability to this study.

1.1* Study Title:

Evaluation Walking
Mountains Science Center

1.1.1 Full Study Title:

Designing an Evaluation System for the Walking Mountains Science Center

1.1.2 If there are other UM

studies related to this project, enter the eResearch ID

number (HUM#) or IRBMED Legacy study number. Examples of related projects include, but are not limited to:

Projects funded under the same grant

IRBMED Legacy study being migrated into eResearch

Previously approved Umbrella applications (such as Center Grants or approvals for release of funding)

Previously approved projects for which this is a follow up study

1.2* Principal Investigator:

Nicole Muench

Note: If the user is not in the system, you may [Create A New User Account...](#)

1.3 Study Team Members:

| Study Team Member | Study Team Role | Appointment Dept | Appointment Selection Complete? | Student | Friend Account | COI Review Required | Edit Rights | Accepted Role? | PEERRS Human Subjects? |
|-------------------|-----------------|--------------------------------|---------------------------------|---------|----------------|---------------------|-------------|----------------|------------------------|
| Nicole Muench | PI | | N/A | yes | No | | yes | N/A | yes |
| Michaela Zint | Faculty Advisor | Sch of Nat Resources & Environ | Yes | no | No | no | yes | Yes | yes |

1.8* Project Summary:

The Walking Mountains Science Center (WMSC), based out of Avon, Colorado, is among organizations that have been offering environmental education programs for preschool aged children. They offer three programs: EarthKeepers, NatureTykes, and Scenic Storytime. All of these programs focus on a variety of indoor and outdoor interactive childparent experiences. The programs are also aligned with the Colorado State Preschool Science Academic Standards and the North American Association for Environmental Education Guidelines for Excellence for Early Childhood Environmental Education. As such, they are designed to facilitate English language acquisition, enhance literacy skills through science topics, and equip young children with the developmental skills to be prepared for kindergarten. All of these outcomes are being taught under WMSC's mission, which is "to awaken a sense of wonder, and inspire environmental stewardship and sustainability through natural science education."

WMSC has "evaluated" these programs in the past by asking parents to describe how satisfied they are with them, in addition to tracking attendance numbers, but the organization has not attempted to assess the program's cognitive or affective developmental benefits for participating children.

At the organization's request, I will collaborate with WMSC staff to develop and pilot test an evaluation system that will help the center meet their goals by evaluating the outcomes of their preschool

programs. This evaluation will assess to what extent they are meeting their goals and learn about ways to improve these programs, both through a questionnaire for the parents to complete and observation protocols for the staff to conduct. I will utilize evaluation research from Powell et al. (2006), Stipek and Byler (2004), Hyson et al (1990) and Miles and Huberman (1994) (among others) in combination with a proven evaluation competency tool, entitled "My Environmental Education Evaluation Resource Assistant" (MEERA) (Zint et al. 2011) to successfully complete all the steps outlined below in Objectives that are necessary for the development of the proposed WMSC evaluation system.

The overarching goal of the project is to develop and test an evaluation system for the WMSC to assess their preschool

program outcomes and inform program improvements.

1.9* Select the appropriate IRB:

[Health Sciences and Behavioral Sciences](#)

1.10* Estimated Study Start Date (Not required for IRBMED): (mm/dd/yyyy)

6/15/2015

1.11* Estimated Duration of Study:

4 months (summer data collection), 18 months (full project timeline)

011.

Application Type

11.1*

Select the appropriate application type.

Exempt Human Subject Research

012.

Standard Study Information

12.1*

Who initiated this study?

Other

If other, please specify:

Walking Mountains Science Center, in partnership with former UMSNRE
Dean Marie Lynn Miranda.

12.2*

Are you or any students working on this project being paid from a federally funded training grant?

Yes No

12.3

This study is currently associated with the following department. To associate this research with a different department, click Select. If the department has defaulted to "student", click select to specify the department through which this application is being submitted.

Sch of Nat Resources & Environ

12.4

Will the study utilize resources from the following centers?

Select all that apply:

There are no items to display

12.6*

Has the scientific merit of this study already been peer reviewed (i.e., reviewed by one or more recognized authorities on the subject)?

Yes No

12.6.1*

List the peerreview organization(s).

Peer Review Organization

Faculty advisor, thesis committee, other student review

12.7*

Is this a clinical trial?

Yes No

Study Team Detail

1.4 Team Member:

[Nicole Muench](#)

Preferred email: nrmuench@umich.edu

Business phone

Business address: 1028 Fuller Street Apt 304 48104

1.5 Function with respect to project:

PI

1.6 Allow this person to EDIT the application, including any supporting documents/stipulations requested during the review process:

Yes

1.7 Include this person on all correspondences regarding this application: (Note: This will include all committee correspondence, decision outcomes, renewal notices, and adverse event submissions.)

Credentials: Required for PI, CoIs and Faculty Advisors

Upload or update your CV, resume, or biographical sketch.

Name Version

[Nicole MuenchResume](#)

| [History](#) 0.02

Conflict of Interest Detail: Required for all roles except Administrative Staff

Current Disclosure Status in MInform:

This study team member has not yet disclosed in MInform.

D1 Do you have an outside interest or relationship with a nonUM entity that relates to

this research in one of the following ways:

The entity is sponsoring this research

The entity's products are used in this research

The entity has licensed your invention (e.g. device, compound, drug, software, survey, evaluation or other instrument) being used in this research

Part of the work on this project will be subcontracted to the outside entity

Other relationship not listed above

No

D2 If "Yes" to the question above, name the entity or entities and provide a brief description of the relationship(s).

Study Team Detail

1.4 Team Member:

[Michaela Zint](#)

Preferred email: zintmich@umich.edu

Business phone 7347636961

Business address: School of Nat. Resources & Env. 2032a Dana 481091041

1.5 Function with respect to project:

Faculty Advisor

1.6 Allow this person to EDIT the application, including any supporting documents/stipulations requested during the review process:

Yes

1.7 Include this person on all correspondences regarding this application: (Note: This will include all committee correspondence, decision outcomes, renewal notices, and adverse event submissions.)

Credentials: Required for PI, CoIs and Faculty Advisors

Upload or update your CV, resume, or biographical sketch.

Name Version

[Zint CV](#) | [History](#) 0.02

Conflict of Interest Detail: Required for all roles except Administrative Staff

Current Disclosure Status in MInform:

This study team member has not yet disclosed in MInform.

D1 Do you have an outside interest or relationship with a nonUM entity that relates to

this research in one of the following ways:

The entity is sponsoring this research

The entity's products are used in this research

The entity has licensed your invention (e.g. device, compound, drug, software, survey, evaluation or other instrument) being used in this research

Part of the work on this project will be subcontracted to the outside entity

Other relationship not listed above

No

D2 If "Yes" to the question above, name the entity or entities and provide a brief description of the relationship(s).

02. Sponsor/Support Information

The following sections request details about the current or pending sponsorship/support of this study. Consider all of the choices below and

complete the appropriate sections.

* Note: At least one of the following sections must be answered. Multiple sponsors or sources of support must be added one at a time.

2.1 External Sponsor(s)/Support:

Type Name Other Direct Sponsor/Support Support Type Has PAF?

There are no items to display

2.5 Internal UM Sponsor(s)/Support: [Including department or PI discretionary funding]

Type Department Sponsor Support

Type

[View](#) UM Institutional Department,

Pilot Grant Program, or other

Institutional funding source

Sch of Nat Resources

& Environ

Financial

2.8 Check here if the proposed study does not require external or internal sponsorship or support:

Internal Sponsor Detail

2.6* Department Sponsor/Support:

Sch of Nat Resources & Environ

2.6.1* Sponsor Type:

UM Institutional Department,

Pilot Grant Program, or other Institutional funding source

If other, please specify:

2.6.2* Support Type:

Financial

2.6.3* Is the support confirmed?

Yes No

2.7 Upload Supporting Documentation

Name Version

[Funding Request Approval from Diana Woodworth](#) | [History](#) 0.01

03. UM Study Functions

3.1* Indicate all functions that will be performed at University of Michigan locations.

Select all that apply:

[Interaction](#) (e.g., information gathering, survey, interview, focus groups, etc.)

Qualitative research (e.g., 'member checking', openended questions, etc.)

Primary or secondary analysis (data/specimen)

Storage (data/specimen)

If other, please specify.

53.

Research Design Exempt

Project

Completion of this section is required based on the response provided to question 11.1

53.1

Upload scientific protocol if one is available.

Name Version

There are no items to display

53.2*

Describe the objective and specific aims of the project. If included in the attached protocol, please indicate the section.

This research study will help develop and test an evaluation system to assess preschool program

outcomes and inform program improvements. It will hopefully contribute to the limited body of research on assessing young children's cognitive and affective changes.

This research will involve two questionnaires voluntarily filled out by the parent participant, one

completed immediately following the program on site, and one sent out via email approximately one month after the program. The initial program will assess child engagement, and parent comfortability and intent, in addition to instructor presentation and demographic questions. By asking for the parent's email address, we will be able to match responses between the questionnaires, which will give Walking Mountains a better sense of how well their programs are tracking over time. This is incredibly useful for the center in several ways, mainly by letting them know where there is room for improvement in their programs and how well what they are presenting is impacting families after they leave the center.

53.3*

Describe the scientific design of the project. If included in the attached protocol, please indicate the section.

The data collection for this project is being conducted on site by certified naturalists who run each of the programs, in addition to seven other programs through the Walking Mountains Science Center, based in Avon, Colorado. They will be trained in how to discuss the questionnaire as part of their program. The only private piece of information that is asked on the questionnaires is the parent's email address, which will only be used for matching responses and not shared with anyone outside of the PI. The data (questionnaire responses) will only be kept on one computer, and no one besides the PI and the faculty advisor will have access, initially. Through the training on how to maintain the evaluation inhouse

(to be conducted next spring), Walking Mountains Science Center will have their own system for maintaining confidentiality of the respondents that will be incorporated into the training.

Timeline:

FebruaryMay,

2015: Develop collaborative relationships with WMSC community program director and staff, partly through completing a front end evaluation and logic model. Develop draft data collection instruments (based on above, literature review, and staff feedback). Literature review on existing early childhood program evaluations.

May/June 2015 Obtain IRB approval for the data collection instruments

June 112,

2015: Collaborate with staff and interns on site to pilot test/improve the data collection instruments and ensure appropriate administration to obtain high questionnaire response rates.

June 12August

or September 2015: Collect data using the evaluation system's instruments.

Download and clean quantitative data, begin descriptive analysis. Begin analysis of qualitative data.

September–December 2015: Collect additional data (if needed). Rerun

descriptive analysis and

conduct significant difference testing. Complete analysis of qualitative data.

JanuaryApril

2016: Complete evaluation system report. Present findings to WMSC staff (this will include a training on how to maintain the evaluation system inhouse)

and during 2016 Capstone

Conference.

53.4*

Describe the subject population for the project.

Local and visiting families to Eagle Valley in the Rocky Mountains of Colorado.

1. EarthKeepers: 3-5 years old + adult.
2. NatureTykes: 6 months old 3 years old + adult
3. Scenic Storytime: 3-5, years old + adult.

The adult present with each child is completing the questionnaire, and answering questions based on both their child's experience and their own experience in the program.

53.5*

Will the study involve recruitment and/or participation of subjects in order to produce new data (e.g., surveys, interaction, intervention)?

Yes No

53.6*

How will the study team interact with human subjects?

They will not interact with the human subjects. Training conducted by the PI and supervised by the client (community programs director) will be conducted on June 9, 2015 that will instruct the naturalists (program staff who run the programs) on how to talk about, administer, and collect the questionnaires as part of their program. The initial questionnaire is done immediately following the program onsite.

Those parents who fill out the questionnaire have the option to write down their email address, and Walking Mountains will only email the followup

questionnaire to those families

who provided us with that piece of information.

53.7*

How will the study team be recruiting subjects?

Recruitment will be done face-to-face

during the programs themselves. The naturalists will mention

that families will have the opportunity to complete a questionnaire at the beginning of the program, and then more information (why we are asking them to complete this questionnaire, who the

information is going to) will be provided at the end of the program as the questionnaires are being filled out.

53.8*

Describe the setting for the research.

The three programs are housed in nature center classroom spaces at both Walking Mountains Science Center and Vail Nature Center, and also involve outdoor time (weather permitting) as part of the programs.

53.9*

Indicate which of the following established subject pools, if any, will be used for recruitment.

Select all that apply:

N/A

Provide Related UM IRB Project Number or Subject Pool Description:

53.10*

Indicate which methods will be used for recruitment?

Check all that apply:

Facetoface

contact (e.g. during a health care visit or an interview at a home address, etc.)

If Other, please indicate below:

53.11*

Risk Level

Click "Add" to enter the risk level associated with this study.

Level Of Risk

[View No more than minimal risk](#)

53.12*

Will the research involve the access, collection, use, maintenance, or disclosure of University of Michigan protected health information (PHI)? PHI is: information about a subjects past, present, or future physical or mental health, the provision of healthcare to a subject, or payment for the provision of healthcare to a subject; AND

that is maintained by a University of Michigan school, department, division, or other unit that is part of the University's HIPAAcovered component (e.g.

healthcare provider, healthcare plan, or healthcare clearinghouse).

Yes No

53.13*

Will subjects receive payment or other incentives for their participation in the study?

Yes No

53.11.1

*** What is the level of risk of harm to the subjects resulting from this research?**

No more than minimal risk

12. Exemption Category

Completion of this section is required based on the response provided to question 11.1.

12.1* Which of the following exemption criteria applies to the study?

EXEMPTION #1 of the 45 CFR 46.101.(b):

Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

121.

Exempt Category 1 Investigational Strategies in Educational Setting

Completion of this section is required based on the response provided to question 12.1.

121.1*

Is the research conducted in an established or commonly accepted educational setting?

Yes No

121.1.1*

Describe the educational setting.

Nature center classrooms and outdoor spaces, both at Walking Mountains Science Center and Vail Nature Center.

121.2*

Does the research involve normal educational practices such as research on regular and special educational instruction strategies, or research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods?

Yes No

121.2.1*

Explain how the research fits the definition of normal educational practice.

The naturalists are certified through three weeks of training, and follow a 5E

teaching model when

teaching any of the programs, whether they are the early childhood programs or other community programs. In participating in this research, parents are providing feedback on the effectiveness of this teaching model by answering questions about different elements that should be covered by the naturalists in all three programs.

121.3*

Upload tests, surveys and/or interview questions.

Name Version

[FollowUp](#)

[Questionnaire](#) | [History](#) 0.01

[Initial Questionnaire](#) | [History](#) 0.01

44. Additional Supporting Documents

44.1 Please upload any additional supporting documents related to your study that have not already been uploaded. Examples include, but are not limited to, data collection sheets, newsletters, subject brochures, and instructional brochures.

Name Version

There are no items to display

45. End of Application