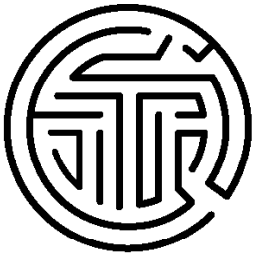

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BRIDGING THE GAP BETWEEN FORMAL AND INFORMAL LEARNING:

EVALUATING THE SEATREK DISTANCE LEARNING PROJECT

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TABLE OF CONTENTS

INTRODUCTION. II
About the SeaTrek Distance Learning Project III

EVALUATION DESIGN AND RESEARCH METHODOLOGIES 1
Selection of participants 1
Data collection 1
Limitation of evaluation design 3

FINDINGS 4
Project Impact on Teachers and Students 4
Profiles of SeaTrek teachers. 4
Perceived student impact. 5

IMPLEMENTATION OF PROGRAM COMPONENTS 6
Program Content 6
Videoconferences 6
Instructional Materials. 7

PROGRAM DELIVERY 10
Science Education out into the Community 10
Professional Development 10
Scheduling 11
Technology. 11

DISCUSSION. 12

CONCLUSIONS AND RECOMMENDATIONS. 14

REFERENCES. 16

APPENDICES 17

INTRODUCTION

Educators and policymakers share significant interest in leveraging the quality educational resources of the nation's informal learning institutions (e.g., museums, science centers, and aquariums) within the nation's schools via distance education. "Today's education system faces irrelevance unless we bridge the gap between how students live and how they learn" (Partnership for 21st Century Skills, 2003, p. ii). However, bridging the gap between theschools, where the educational focus falls internally on mandated improvement of academic standards for all children and informal settings, where the external opportunities and learning resources exists, has proved challenging.

As an educational strategy, distance education involves learning in a different place from teaching,where the learner can be a child or adult (including teachers). It relies on quality learning materials and an effective management system. Although distance education has suffered an undeserved reputation as an inferior form of learning, its potential benefits, numerous if adequately designed and managed, include the following:

- Distance education programs can adapt to specific student needs or work requirements because of their design and delivery systems.
- Distance education can reach learners who are economically marginalized groups and can't afford to visit informal settings like museums, aquarium, etc.
- Distance education can allow an interactive, learner-centered environment.
- Distance education can operate at much more efficient staff-to-student ratios.

Museums, aquariums, and other informal learning institutions are increasingly providing broader public access to their resources using technology. These institutions have become aware of the benefits they offer schools, and as a result, are using interactive learning systems to bridge the formal-informal gap by providing schools with rich educational resources and experiences. These educational programs expose students to scientific research as conducted by "real" people they can see and interact within the field, help students adopt new attitudes toward learning in formal settings, engage them in new types of learning activities, and help them explore new forms of social interaction with peers and adults. Examples of such programs include the JASON Project, founded by scientist and oceanographer Dr. Robert Ballard; the NASA CONNECT program; and San Francisco's Exploratorium museum's live webcasts and digital library. This study focuses on one such program: The SeaTrek Distance Learning Project, housed at Mote Marine Laboratory in Sarasota, Florida.

About the SeaTrek Distance Learning Project

An outreach educational program based at Mote, the SeaTrek program draws upon the Lab's more than fifty years experience in marine science research, which focus on raising awareness of Marine life and the field of marine science research (www.mote.org). The educational goal of the SeaTrek project is to spark student interest in science and communicate information about real-world research and conservation work at Mote to students and teachers in Florida. According to its Director, "What it does is to give students in their classrooms an exposure to something exciting and interesting in the real world… we're creating this interconnectedness that will enable students to have not just Internet, but live resources to get across how cool science is when you see it working in the world." To accomplish this goal, the program uses interactive video conferencing technology and the Internet to deliver science courses to 4th through 8th grade students in schools across Florida, and in Virginia, New York, New Jersey, Texas, Wisconsin, North Dakota, Indiana, Michigan, Illinois, and Missouri.[1]

Each SeaTrek videoconference session is supported by a content package, free and downloadable in PDF form from the website: (www.seatrek.org), fully aligned with Sunshine State Standards. SeaTrek's educational focus is on southwest Florida's coastal region and current program themes include "Mammals, Mammoths, Manatees!," "Sharks – Devouring the Myths," "Mission See Deep: Remotely Operated Vehicles," "Sea Turtles – Amazing Reptiles of the Sea," and "Coastal Habitats." According to Freeman and Sokoloff (1996), thematic approaches are a powerful tool for teaching and learning with application for museums and informal institutions, and thematic learning works best when it is interdisciplinary, built around a central question, and rooted in an approach that links experience and reflection. The SeaTrek online instructional materials are free and available to download, and are to be used in the classroom both before and after the live program.

The SeaTrek videoconference sessions are conducted from a studio at Mote Marine Lab, and are facilitated by two Mote education staff, a dynamic program presenter and a technology coordinator. The program presenter provides up to six 50-minute-programs each day, and is responsible for interacting with the students and keeping the program dynamic and on time. The technology coordinator manages the "behind the scenes" video and technology. Videoconferences incorporate a mix of live feed, PowerPoint slides, pre-recorded video segments, Internet and blue screen throughout the 50-minute presentation.[2] The SeaTrek videoconference courses are designed to be highly interactive, with a goal of sparking student interest in science, communicating information about real-world research and conservation work at Mote; and are designed to be point-to-point, although they may be bridged, and include one or more live presenters, video of scientists and animals, PowerPoint, sound effects and music, document camera and chromakey. The presenter uses skulls, animals, and other artifacts as visual aids; and demonstrates general science concepts with experiments in the studio connected to both scientists' field research and basic scientific concepts students are learning in school.

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[1] Programs outside of the areas covered by grant funding are available by request for a fee of $145 plus connectivity.
[2] While Mote has the ability to "bridge" (to videoconference to up to three schools at the same time), this is not performed often as it takes away from the personal attention the presenter can give to each school and to each individual student.

Through three consecutive Florida State Department of Education Technology Literacy Challenge Fund grant awards and in partnership with Sarasota County Schools, the SeaTrek program (1) expanded from the original seven Sarasota schools in 1998, to 43 schools across the state (as of the end of the 2003 school year) ranging from Bay County in the panhandle to Monroe County in the Florida Keys; (2) installed videoconference systems in participating schools, trained participating teachers and students, and delivered science programming; (3) served more than one hundred teachers and three thousand students, as well as worked with more than 30 Instructional Technology Facilitators (ITFs) across Florida; (4) collaborated with Marie Selby Botanical Gardens, NASA Kennedy Space Center and Florida State University. The rapid expansion of the program in the last six years has warranted the need for an external evaluation looking at program implementation issues and program impact on teachers and students.

Education Development Center's Center for Children and Technology (CCT), a technology and education research and development organization, conducted an evaluation study of the SeaTrek program from May 2003 through September 2003. CCT examined the program's overall usability, the relevance of its instructional materials, and the effectiveness of its live presenters, technology tools and infrastructure in increasing student perceptions of science as an engaging discipline as well as student reaction to inquiry-based learning approaches. This report describes findings from this research.

The report contains the following sections: First, it describes the Evaluation Design and Research Methodologies. Second, it presents the Major Findings, organized within two subsections: Project Impact on Teachers and Students, and Implementation of Program Components (program content and program delivery). Third, this report includes a Discussion section. Finally, the research team draws its Conclusions and Recommendations.

EVALUATION DESIGN AND RESEARCH METHODOLOGY

The study, conducted during the 2003 school year, examines the impact of the SeaTrek project on students' perceptions of science as an engaging discipline and student reaction to inquiry-based learning approaches as well as the Project's overall usability in school settings. To answer these questions, we used interviews, focus groups, observations, and surveys. CCT staff worked closely with teachers and ITFs, and SeaTrek program staff during the data collection phase of this study.

Selection of participants

In consultation with SeaTrek program staff, CCT decided to work closely with two of the twenty-five Sarasota schools that are currently participating in the SeaTrek project. Our criterion in the selection of these schools included the level of technology infrastructure available in the school, length of involvement with the SeaTrek program, and degrees of available educational resources and support in the school. Schools with different profiles were selected in order to ensure that these SeaTrek participants were representative of a wide range of users.

Data Collection

Research instruments for this study included the use of questionnaires, observations, interviews, focus group, and survey tools. Researchers made three site visits to Sarasota to collect data. During these site visits CCT interviewed the SeaTrek project staff as well as the SeaTrek teams at each school, which were comprised of one ITF and two staff members at one school, and one ITF and three teachers at the other. CCT researcher observed the SeaTrek videoconferences both from the schools as well as from the SeaTrek studio.

Observations

- The observation protocol was designed for teachers, students, and the SeaTrek videoconference presenter (see Appendix). It addressed the following themes:
- Students – interaction (with presenter, teacher, classmates), attention, response (answer question, engaged, etc.), teamwork, videoconference etiquette.
- Teachers – interaction (with presenter, students), attention, response (answer question or facilitation of student response, engaged, etc.), facilitation of videoconference etiquette.
- Videoconference – presenter style, interaction with participants, content areas (science, math, language arts, etc.), structure (interviews, video, website, live presenter, etc.).

CCT researchers used the protocol to observe the SeaTrek's videoconferences in seven classes from two Sarasota schools, and observed the delivery of three videoconference sessions from the SeaTrek studio.

Interviews

The interview protocol included the following themes: teacher background, technology background, technology use in classroom and technology level of students, involvement with SeaTrek, experience with SeaTrek videoconferences, use of SeaTrek curriculum (pre and post videoconferences), challenges and successes with SeaTrek program (see Appendix). CCT researchers conducted interviews with the three members of the SeaTrek project team, as well as five teachers and three Instructional Technology Facilitators (ITFs) from the two schools that we visited.

Focus Group

We used a focus group to help us determine teachers' perceptions of the influence of the videoconferences on students as well as to discern patterns of use of the SeaTrek instructional materials among SeaTrek's target population of teachers. The focus group protocol included the following themes: videoconference (content and format), the instructional materials (content and influence of the curriculum on students) and suggestions for improving the program. It was developed by CCT researchers based on preliminary survey results. The focus group lasted approximately 90 minutes and took place at Mote Marine Laboratory in August 2003. An "assistant moderator" took detailed notes during group interview and in addition it was recorded and transcribed with participants consent. Four teachers from various Sarasota schools and one ITF participated in the focus group. Participants were provided with a gift package from the Mote Marine gift shop in exchange for their participation.

CCT researchers followed their institutional review board's procedures for obtaining informed consent for all participating adults. In order to be interviewed or to participate in a focus group, teachers and ITFs who were interviewed also signed a consent form. Furthermore, prior to discussing the above topics or observing broadcast sessions, participants were introduced to the evaluation team and each evaluator's role; were given an explanation about the purpose of our visit in particular; and were informed that the collected data would be used to write a report in which their names would not be used.

Online Surveys

> Surveys are "one of the common data collection strategies employed in educational research [today]" (Fetterman, 2002, p. 29). Participants in the online survey were respondents to email requests that were sent to all teachers and ITFs who have been and are currently SeaTrek participants. Twenty-four teachers and two ITFs responded to an online survey that was sent out to approximately one hundred and fifty SeaTrek participants (response rates of 24% and 4%, respectively).

The survey covered the following areas: teacher background, teacher experience, pedagogy, technology experience (personal and in-classroom), distance education experience, experience with SeaTrek program (videoconferences and curriculum), strengths and challenges of the SeaTrek program and recommended next steps.

The email survey request was delivered three times over the course of the summer and fall of 2003 in an attempt to gain a greater response rate. Initially participants were offered a gift package from the Mote Marine gift shop that included three books and pencils. The final time the request was sent in early September, SeaTrek staff offered a discount on future videoconferences to teachers and staff who completed the survey. The responses increased from 24 in summer 2003 to 26 in September 2003, a gain of 1% response rate.

Data Analysis

CCT researchers analyzed the data for emergent themes to serve as the basis of a detailed report of teachers' and ITFs' experiences, views, feelings, and expectations of the SeaTrek science curriculum. The researchers then refined the findings based on their conversations with SeaTrek project staff, as well as their own perspectives about the SeaTrek project.

We conducted a series of frequency analyses on the survey data collected from the 24 participating teachers and two ITF. We used the frequency analyses to develop teachers' profiles based on their personal and teaching backgrounds, and experience with the SeaTrek Distance Education Project.

Limitations of Evaluation Design

As in any qualitative study, because of the small numbers of involved, participants cannot be expected to be representative of their target population in a statistical sense, and the findings might not be generalized from one specific focus group or survey response group to the entire population of SeaTrek teachers in Sarasota or in Florida.

Although the survey instrument in this study allowed us to collect large amounts of data about the SeaTrek teachers' use of the curriculum, we faced difficulty in gaining a greater response rate, even after distributing the survey by email a total of three times. These challenges are very common in survey development and distribution (Fetterman, 2002), and most of them were addressed in our study. Overall, we derived useful and sufficient insights from our evaluation design, which outweigh the above methodological limitations.

FINDINGS

Project Impact on Teachers and Students

Profiles of SeaTrek Teachers

- The SeaTrek project primarily served female teachers teaching in the upper elementary grade levels, and diverse schools and students.
- The SeaTrek primarily introduced teachers to their first videoconference-based science learning program.
- The SeaTrek project seemed ideally to target teachers with high level of technology access and literacy in Sarasota County.

In Sarasota County, most of the survey respondents were 5th grade female teachers with a range of teaching assignments, similarly to the focus group participants and site visit interviews. A little more than half of the respondents to the survey taught general elementary school (all subjects) while the rest taught individual subjects such as general science (6), life science (2), physical science (2), earth and space science (3), math (2) and English/language arts (4). As stated above, a total of twenty-four teachers and two ITFs responded to the online survey.

The SeaTrek project served diverse schools and students. Most of the respondents to the online survey reported that they teach in a "suburban community" (18), while the rest classify their teaching environment as "urban". The ethnicity of the majority of their students is White (non Hispanic) (73%), while 19% are African American.

For most of the teachers we spoke with as well as the survey respondents (77%, 20), SeaTrek was the only videoconference-based distance learning program they had participated in; while a few (15% of survey respondents, 4) had experience with similar programs such as those offered by Selby Gardens and NASA, whose distance learning initiatives used Mote studios to broadcast their videoconferences.

The SeaTrek project also seemed to target teachers with high level of technology access and literacy. Most of the teachers we spoke with and who responded to the survey had been involved with SeaTrek for at least two years and generally had a high level of technology literacy. Nearly all of the survey respondents had access to technology both at their school (92%, 24) as well as at home (100%, 26), and 81% (21) had been using technology in their classroom for at least six years. Nearly half of the respondents (46%, 12) reported engaging in computer activities with their students every day, while another 31% (8) say they used a computer with their students a few times a week. Generally there was a school-based Instructional Technology Facilitator (ITF) who was the direct contact with Mote, and who worked with the teachers during the implementation of the programming.

Educators believed that the SeaTrek program provided them an alternative way to present science information to students, and made accessible complex science concepts using local natural environments. In the words of one SeaTrek teacher, "SeaTrek is another component of our information literacy skills for our students."

Perceived Student Impact

- Teachers felt that SeaTrek videoconferences motivated students to learn more about how scientists work in teams and how to solve problems, and increased their interest in Science.
- Teachers reported that SeaTrek instructional materials helped student to better understand the field of science and what scientists do.

Teachers CCT spoke with overwhelmingly felt that the SeaTrek program motivated their students to learn about science. One teacher said "it shows them what scientists do. It is neat for them to see what scientists in their community are doing and that they have a sense of humor!"

Teachers and ITFs who responded to the survey preferred certain SeaTrek programs. When respondents were asked to rate on a scale of 1 to 5 (with 1 being the least liked and 5 being the most liked) which SeaTrek videoconference their students liked best as well as which instructional support materials that their students liked best. Respondents reported that their students like "Sharks – Devouring the Myths" videoconference and instructional materials the best (8 respondents selected '5' and 2 respondents selected '4'). Coastal Habitats was listed as the second favorite videoconference (5 respondents selected '5' and 6 respondents selected '4'); however, the instructional materials for this program were reported to be the least liked (6 respondents selected '1' or '2' and five selected '3').

When asked about the influence of the SeaTrek instructional materials on student learning, nearly all of the respondents felt that the materials helped their students learn more about how scientist work in teams and about how to solve problems as well asincreased their interest in Science (77%, 20; 81%, 21; and 88%, 23; respectively). Many of the respondents felt that the materials helped their students learn more about Science-related professions and how to work with multimedia (65%, 17 and 69%, 18; respectively). For example, one teacher noted the impact of the SeaTrek "Sharks" program even after her students returned to her classroom, and said, "They loved it!!!! They were full of questions that spilled over back into our classroom. This spawned a whole unit on research, questions, projects, and research." However, more than half of the participants did not feel that the materials helped their students learn more about designing science experiments and how to present what they know.

Furthermore, the opportunity to interact with real scientists and real life science can be great source of motivation for students to pursue studies and careers in the areas of science and technology. Many of the educators we spoke with felt that this was a benefit of the SeaTrek program for their students. One recognized the importance of this aspect of the program and said that SeaTrek "awakened" her students to different professions, and that "the students will often ask about the jobs of the people they see in the videoconference."

IMPLEMENTATION OF PROGRAM COMPONENTS

SeaTrek received Technology Learning Challenge Fund grants for three years, and used these funds to scale up the video conferencing aspect of their program and to include five staff members on their team. The end of the last year's appropriation came in the spring of 2003 and permitted three staff members on the SeaTrek team; the director, the coordinator/tech facilitator and the videoconference presenter. In addition to being the implementers of the SeaTrek project, this three-member-team was involved in the implementation of other similar science educational programs, such as the JASON Project. However, both teachers and ITFs we spoke with as well as those who responded to the survey indicated repeatedly that one of the strengths of the SeaTrek program was their talented and dedicated staff (nearly all of the survey respondents agreed with this statement: 96%, 25).

Program Content

- Most teachers rated positively the quality and content of the videoconference sessions.
- Most teachers felt that SeaTrek instructional materials helped them meet their district/school standards as well as state standards.
- Teacher's role as facilitator during the videoconferences varied between active and passive participation.
- Some teachers find the instructional materials contain information that is at too high of a level for their upper elementary students or is "too time consuming" to implement in the classroom.

Videoconferences

All of the teachers we spoke with had positive remarks about the videoconference. One teacher said that her students had learned that video can be an educational tool, and "they are now able to distinguish movies from educational experiences." Teachers felt that the videoconference content had improved over the years and become more kid-friendly, as one teacher commented "there are less boring scientists and more interactivity and high energy." Many also mentioned the SeaTrek presenter's dynamic presentation style as one of the strengths of the programs. They did report, however, that the latest program "Coastal Habitats", while informative, was not as interesting as the somewhat more "exciting" topic of "Sharks" and contained some vocabulary that was over the heads of students.

Survey respondents also generally responded positively to the videos, and reported that their students enjoyed watching them, with "Sharks" and "Coastal Habitats" being the favorite programs.

Respondents to the survey rated the videoconference sessions highly. They were asked to mark whether they disagreed or agreed (on a scale of 1 to 5 with 1 being strongly disagree and 5 being strongly agree) with a list of statements about the videoconferences. Most respondents (73%, 19) 'strongly disagreed' or 'disagreed' with the statement that reading a book is of equal educational

value for their students as participating in the videoconference and also disagreed that their students viewed the videoconferences as purely entertainment (81%, 21). Most also 'strongly disagreed' or 'disagreed' with the statement that the videoconferences were too challenging for their students (81%, 21) or that only their higher level students could follow the videoconferences (81%, 21). Educators who responded to the survey agreed that the interactive component made their students become involved (92%, 24) and that students felt involved in something important beyond their classroom (92%, 24). Most also felt that the SeaTrek videoconferences were especially good for their students with little motivation to learn (77%, 20).

Teachers we observed demonstrated a range of understanding of what was expected of them in the role of facilitator. Some teachers were actively involved, translating the SeaTrek presenter's questions and giving students clues to answer correctly, serving almost as a translator between the presenter and the students. Others took on more subtle facilitation role, encouraging the kids to become directly involved with the SeaTrek presenter. There were also teachers who were not involved at all, and chose to use the time to take care of personal work.

Instructional materials

There were mixed reviews on the usability of the SeaTrek instructional materials.

Respondents were asked about the usefulness of SeaTrek materials in helping to meet instructional objectives. Nearly all of the respondents felt that SeaTrek instructional materials helped them meet their district/school standards as well as state standards (85%, 22 and 88%, 23; respectively).

In terms of the time frame of implementing the curriculum, teachers reported it taking from one to two weeks, including the time spent for the videoconference. One teacher said that before the videoconference she uses a combination of SeaTrek materials and her own resources, "We may do a basic review, like bingo or some other games like a memory game…I then go through the lessons as they are written. Then we do some type of game type review before hand. Then after the videoconference if we have something to finish we finish it up and then we do the post test." Moreover, the majority of teachers felt that the materials helped them assess student performance and prepare for testing (18 and 16, respectively).

Survey participants were also asked why they don't use the instructional materials. Some teachers indicated that the materials were "too difficult" and "too time-consuming" to implement in their classrooms. One teacher felt that the curriculum topics didn't always match the videoconference topics, so they didn't effectively prepare her students to be involved in the videoconference. When participants were asked to rate the instructional materials (from 1 to 4 with 1 being needs improvement and 4 being does not need improvement), respondents indicated that two aspects of the curriculum needed the most improvement: length of curriculum and user-friendliness Nine participants (35%) indicated that length was their most important and second most important reason, while seven indicated that user-friendly structure was their most important and second most important reason.

Teachers we spoke with who had been involved with the program for more than two years thought that the original SeaTrek curriculum worked better for them in the classroom, and was more easily integrated into their classroom curriculum than the newer iterations of the materials. One teacher said that "the teachers used to not have to do extra work – we just used all the activities as they were – and now we have to work to adapt the activities and dig through and see what is appropriate, which is really time consuming." Another teacher suggested refining original curriculum to make it better. She offered to come in during the summer to help do this, demonstrating a strong commitment to the program.

Teachers we spoke with who were newer to SeaTrek, and who also happened to have more technology resources in their school, did not report difficulty integrating the instructional materials into their curriculum. Two mentioned that they easily integrated the instructional materials in their curriculum "whenever it is appropriate" and one teacher felt that integration was uncomplicated because the materials "match the state standards, which are broad enough to fit a lot of variety within."

Comments that were common to many of the teachers we spoke with was that some of the curriculum concepts were not age appropriate and that it was too lengthy to be easily implemented in the classroom. One teacher commented that "Coastal Habitats," a newer program, was "much more information-dense than previous programs, and geared toward an audience above the fifth grade." Another educator remarked, "At the beginning the curriculum was written for elementary level but now it is high school focused. The vocabulary is at a higher level, and so are the activities." Another agreed, saying, "I tend to see that my average to above average students can keep up with the curriculum that Sea Trek provides, however, for many of the students in my classroom, the lessons are over their heads." Educators also mentioned that the NASA program that they participated in through SeaTrek was also geared toward more advanced students.

Participants we spoke with as well as respondents to the survey sometimes confused the NASA and Selby Gardens videoconferences as being part of SeaTrek. When they did distinguish between the programs, participants preferred the SeaTrek programs to both NASA and Selby, which they felt were less kid-friendly. One teacher said: "The Mote SeaTrek programs … including the sharks, ROVs, Manatees, etc., were much more user friendly than the Selby program." Another added: "NASA never gives more assistance with their lesson plans, not realizing that our books may not contain the information that they require. Mote and Selby lesson plans are great and I have used them independently from the SeaTrek program to enhance my science."

Preparing prior to the videoconference session is critical to fully benefiting from the SeaTrek project. One teacher said that, in order to provide a quality educational experience for students, teachers have to feel comfortable adapting and trying something new. "You have to be able to try something new and make it fit in to the curriculum." She said that she had no trouble integrating the SeaTrek instructional materials.

Teachers who reported doing pre and post activities around SeaTrek were enthusiastic about the program as a whole.One teacher described the extensive background work that students did in conjunction with the "Sharks" program. Not only did the class do the activities provided in the SeaTrek curriculum, but also the students conducted online research and voluntarily stayed after school to produce their own infomercials about sharks. Another teacher described the way that she uses the instructional materials and prepares for the videoconference. She selects two students to be technology helpers. They help her review all of the websites listed as resources in the curriculum and decide which will be most useful for the class. The helpers then set the websites on the Favorites menu of every classroom computers.

She also goes through the curriculum quickly and identifies vocabulary terms that her students will have to know before the videoconference. She said she tends to spend about a week's worth of time on the curriculum in the class.

PROGRAM DELIVERY

Science Education out into the Community

The SeaTrek program harnesses the wealth of science knowledge and resources that are found within Mote Marine Laboratory and Aquarium, and transfers it into the larger community in a relevant way. For instance, not everyone is able to visit the aquarium in person, and thus, benefit from its educational resources. SeaTrek's director commented, "What we do is to give students in their classrooms an exposure to something exciting and interesting in the real world so that it's not a matter of learning from basically in school types of materials. They have a chance to connect with the outside world and they and their teachers are all together experiencing something from this beyond the classroom… it may be that they can't just call up a scientist and ask questions… it doesn't work that way, so we're figuring out what does work. If you're in Oklahoma, you're not going to see Mote Marine Lab. This is an effort to make those gaps close… to use this to do the best job possible that this technology will permit."

Teachers felt that the delivery of important science resources to students in formal settings was smooth, lively, and interesting. One stated, "My class really liked the presenter from Mote. She made it interesting with games and jokes. The instructors from Mote and NASA were highly motivating to the students!" Another enthusiastically said, "The SeaTrek programs were so incredibly organized and beautifully presented by such dynamic individuals that I have raves and compliments for all the programs offered!! The SeaTrek programs are fantastic teaching tools for my curriculum!" SeaTrek participants also felt that SeaTrek staff was responsive to their feedback. One participant noted, "The programs improved in quality from last year to this year. I feel as if they responded to my feedback last year and [they] are conscious of the need to keep getting better."

Professional Development

ITFs are responsible for supporting teachers with technology integration at the school level. A few ITFs provide informal professional development for teachers around facilitation of the videoconferences or implementation of the instructional materials. One ITF we spoke with worked closely with teachers around implementation and modeled some of the online activities for them during students' lab time. Other ITFs provided the teachers with the printed curriculum and allow them to adapt it for themselves.

SeaTrek staff provided technical support to ITFs and teachers. Most survey respondents (88%, 21) had not participated in any professional development around SeaTrek. Of those that did, one reported that their professional development was provided by their tech facilitator, the other two said it was provided by Mote staff. When asked to list the reasons why they did not participate in SeaTrek professional development (from most important to least important with 1 being the most important reason and 6 being the least important), half of the respondents (13) listed "I understand how to implement SeaTrek without the training" as their number 1 and 2 most important reasons.

When survey respondents were asked what professional development would help them to implement the SeaTrek program, answers ranged from "Teacher training (hands on activities) to help teach the units," "Methods and different ways of implementation would be helpful," and "I'm not sure - perhaps suggestions for adjusting material that is beyond my students' reading level" to "I don't think any is needed."

Scheduling

A common request of teachers we spoke with regarding scheduling was that they would like programming to begin earlier in the year, enabling them to participate in several of the programs without feeling like they occur right on top of one another. Several teachers said they would like to know by August what the programs were going to be, so they could construct their curriculum accordingly. One teacher commented, "They don't have to give us exact times, but just the exact weeks for each program. Instead of "OK now I have to do space but I am in the middle of plants." Teachers also mentioned wanting to have the instructional materials at the beginning of the year, which would aid greatly their ability to fit the SeaTrek resources into their own units.

Several teachers said that even when they are participating in just three programs it is difficult to fully explore the topics and address all of the educational goals. Participating in four conferences, they added, lessens the quality of the experience. Another teacher agreed, and commented, "we are just finishing one [SeaTrek program] and we have to stop because another one comes up." Some teachers also mentioned a desire to choose their own timeslots for programs, though they recognized that this might not be possible.

Technology

SeaTrek teachers reported a variety of experiences with technology during the videoconference program. Some teachers reported having no problems. One ITF said they tested their equipment the day before and the morning of the videoconference.

Other teachers had to troubleshoot their way through several videoconferences to overcome cameras breaking down, bridging problems and difficulties with the initial hooking up. Teachers who succeeded in overcoming the technological glitches were usually those who have a strong technology support system at their school, as SeaTrek does not provide on site tech help. One teacher who had trouble connecting several times commented, "They need a help desk. If there is an emergency, you don't know what to do. By the time I reached [the SeaTrek technical support], he knew exactly what our problem was and helped me out but that was after the fact and we missed the videoconference." One teacher stressed the importance of having secure technology support because "when something happens it is big trouble because we have to reorganize our entire schedule that day."

DISCUSSION

The goal of "scientific literacy for all" calls for educational program that supports educators in meeting students' varied needs in multiple and innovative ways (Education Trust, 2003; National Research Council, 1996). Scientific literacy helps students gain skills like questioning, explaining, and making prediction, which have a strong impact on students' understanding of scientific concepts and content (Bransford, Brown, & Cocking, 2000; White & Fredericken, 1998). The SeaTrek project's approach to scientific inquiry encompasses the attributes of the National Science Education Standards' definition of inquiry:

> *[The] diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work. … [And] the activities of students in which they develop knowledge and understanding of scientific ideas, as well as an understanding of how scientists study the natural world. (National Research Council, 1996, p. 23)*.

Although current national science curriculum and standards are designed in the spirit of the goal of scientific literacy for all, most K-12 science programs have yet to fully address it (Songer, Lee, & Khan, 2002). Little research about how to promote science learning and achievement for all types of students is available. Lee (2003) notes, "Research is still at the stage of conceptualizing issues that need empirical testing" (p. 480). Moreover, the American Association for the Advancement of Science's Project 2061 has made clear that middle school science textbooks are not up to the task of helping students learn key ideas in science (Kesidou & Roseman, 2002; Roseman, Kesidou, Stern, & Caldwell, 1999). Indeed, one communiqué about the project is titled, "Heavy books light on learning: Not one middle grades science text rated satisfactory by AAAS's Project 2061" (Project 2061, 1999). Therefore, the educational orientation of the SeaTrek project toward schools, outlined in this report, is important and relevant insofar as it contributes to the effort of providing scientific literacy for all through an engaging online science curriculum and a flexible and sensitive delivery system that bridges the gap between formal and informal learning. In this section, we discuss the concept of scientific literacy in the context of the SeaTrek project in terms of (a) scientific inquiry skills, and (b) learning experiences and environments. Specifically, the SeaTrek project is an alternative informal science education program that addresses the scientific literacy needs of students in formal settings.

At the core of the SeaTrek curriculum is the idea of making visible the educational resources available to teachers and students via videoconference. It provides teachers and students with opportunities to engage with science by seeing it, being curious about it, and interacting with it, thereby increasing their understanding of how science works and is connected to their local natural environments. The combination of showing and telling is an effective way of teaching complex science concepts and processes, as well as increasing students' motivation to learn. Our findings show that the SeaTrek program motivates students to learn about science as well as see how scientific ideas and skills are applied in real world situations. According to the teachers, their students are exposed via videoconference to "… many of the same activities and thinking processes as sci-

entists" (National Research Council, 2000), as well as real world science topics. In today's schools, it is critical to maintain and increase student motivation for learning about science (Anderman & Midgley, 1997). Lumsden (1994) notes, "Unfortunately, as children grow, their passion for learning frequently seems to shrink. Learning often becomes associated with drudgery instead of delight . . . . . Many are physically present in the classroom but largely mentally absent; they fail to invest themselves fully in the experience of learning." The SeaTrek project is very aware of the importance of students' attitudes and beliefs about learning, which need to be taken into account in the design and development of the SeaTrek each year. Furthermore, the SeaTrek helps dispel the myth that students cannot get motivated and learn about science.

The challenge for teachers and educational systems – especially those serving diverse populations of students – is how to create suitable learning environments. The SeaTrek project exposes schools to "real science" environments where scientists talk about their work and the scientific process, and show aspects of their work. The SeaTrek can result in increased student engagement and understanding through the exposure of students, teachers, and technology coordinators to new ways of learning about "how to use their knowledge and skills – by thinking critically, applying knowledge to new situations, analyzing information, comprehending new ideas, communicating, collaborating, solving problems and making decisions" (Partnership with 21st Century Skills, 2003). The SeaTrek project staff has been continuously working to further these goals over the years.

CONCLUSIONS AND RECOMMENDATIONS

The SeaTrek program fulfills a critical role in today's field of science education by bridging the gap between informal and formal learning settings. Specifically, it educates students, teachers, and instructional technology facilitators about the interconnectedness and importance of the global environment in ways that makes science learning relevant. SeaTrek provides an alternative way to present science information to students, and makes accessible complex science concepts using local natural environments and a flexible technology delivery system. Important science resources are smoothly introduced to students from an informal site via engaging videoconference sessions. Many of the teachers we spoke with identified the delivery of the program—smooth, lively and interesting–as a highlight of the videoconference experience.

The SeaTrek project will likely increase its success over time provided it continues to address the emerging challenges inherent in planning and implementing science and technology initiatives that strive to reach communities in both formal and non-formal educational settings. Concrete issues that need to be addressed by the SeaTrek program include the following:

- Scheduling and lack of time: Some teachers felt challenged by time constraints and unit pace.
- Technology access: Teachers in schools with fewer technology resources faced greater challenges in implementing both the videoconference and the instructional materials.
- Age-appropriateness: Teachers expressed concern that the SeaTrek curriculum and activities had become geared toward upper grade students in recent years.
- Maintaining SeaTrek identity in joint videoconferencesd: Teachers foundthe use of SeaTrek with other programming, such as NASA and Selby, confusing, leading some to mistake these programs as being part of the SeaTrek.

Teachers and technology facilitators who participated in the SeaTrek program provided suggestions about how to improve aspects of the program. They recommended the following changes:

- Increase students' and teachers' involvement and awareness of Florida's ecology
- Avoid videoconference sessions immediately after holidays and vacations.
- Provide the curriculum materials at the beginning of the school year as well as ample time between programs so that teachers can plan better.
- Keep an up to date schedule on the SeaTrek website so teachers can keep track of scheduling changes.
- Provide access to curriculum materials and student activities geared more toward elementary students. An example of such a unit is "Sandy the Sand Shark." The teachers said their students enjoyed learning about this unit at the elementary level, and believed it was age appropriate.

- Expand existing curriculum materials by adding a unit on dolphins/porpoises; Chemistry and Physics; symbiotic relationships of insect, animal and plant species; sea creature rehab or behind the scenes at Mote; and a field trip experience.
- Give teachers choices about what units they would like to participate in.
- Help teachers integrate the program into their curriculum in a more explicit fashion.
- Provide greater technology support during the videoconference sessions.

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APPENDICES:

I. SeaTrek Activity Photo

II. Research Instruments

(2003, J. Robertshaw)

Students at Phillippi Shores Elementary (Sarasota, FL) participate in a SeaTrek videoconference. Students are led through a series of"Simon-Says"-like activities that serve to illustrate the concept ofwildlife diversity in estuary habitats. (2003, J. Robertshaw)

SeaTrek Survey conducted by
The Center for Children and Technology
In cooperation with Mote Marine Laboratory's SeaTrek Distance Learning Program

The Center for Children and Technology is an independent, nonprofit research organization. All information is confidential; your name will not be linked with your responses to this survey and all survey data will be sent directly to researchers at CCT. In order to obtain accurate and detailed information, CCT researchers may contact you by phone or email to follow up with a few additional questions.

Your input is valuable, thank you so much for your time!!

The Mote Marine Laboratory's SeaTrek Distance Learning Project Teacher Survey

Teacher Background

Full name
First name _____ Last name _____
Are you…? Female ___ Male ____
Contact information
School Name _____
School Address _____
School County _____ (Sarasota County or other)
Is your school…?
___An elementary school
___A Junior high/middle school
___A senior high school
Which of the following best describes the community in which this school is located? Check only one answer
_____ A rural or farming community
_____ A suburban community
_____ An urban community
_____ Other
Please describe other _____
Do you describe yourself as …? Please check one answer.
_____ African-American
_____ Asian-American
_____ White (non Hispanic)
_____ Latino/Hispanic American
_____ Native American
_____ Other
Please describe other _____
What is the ethnic background of the majority (>50%) of your students? Please check only one answer.
_____ African-American
_____ Asian American
_____ White (non Hispanic)
_____ Latino/Hispanic American
_____ Native American
_____ Other
Please describe other _____
What grade(s) do you teach? *Check all that apply*
___1 ___2 ___3 ___4 ___5 ___6 ___ 7 ___8 ___ 9 ___10 ___11 ___12
What is the highest degree you have obtained?
___A college undergraduate degree
___Master's degree
___Ph.D.
___Other
Please describe other _____
What are the types of science academic training you have obtained? (Check all that apply.)
___Science certification
___Science coursework
___Other _____

Teaching Experience

How many years have you been a full-time K-12 teacher?
a) ____ years b) ____ I am not a full-time teacher

What subject(s) do you teach? (Check all that apply).

___All subjects
___General science
___Life science
___Physical science
___Earth and space science
___Math
___Art
___English/language arts
___History/social studies
___Basic skills
___ESL/Bilingual education
___Technology
___Foreign language
___Vocational education
___Other_____

How long are your class periods?

___35 minutes b) ___45 minutes c) ___50 minutes d) ___Block scheduling e) ___Other
Please describe other _____

How often do you teach science in the classroom?

___At least once a day
___2-3 times a week
___Weekly
___Twice a month
___Once a month or less

On average, how many students are in your classes? _____ students

What is the academic placement level of the majority of your students? Please check only one answer.

____ Honor students
____ Achieving academically at and/or above average
____ Achieving academically below average
____ Labeled as "At-risk" academically
____ Limited English Proficiency (LEP)
____ Special Education students

Teacher Pedagogy

What kinds of assessment techniques do you use in your classroom? (Check all that apply).

___Essay exams
___Student presentations
___Multiple-choice tests
___Reports
___Portfolios
___Peer assessment rubric
___Poster sessions
___Self-assessment rubric
___Assessment by outside experts
___Other
Please describe other _____

How often are you told in detail what to teach at given times and what materials must be covered? Check only one answer.

__ Never ___ Sometimes ___ Often ____ Very often

How often are you solicited for input into how to teach these materials in your classroom? Check only one answer.

__ Never___ Sometimes ___ Often ____ Very often

Do you have structured time to …? Check all that apply.

a) Meet with colleagues Yes ___ No ____
b) Observe colleagues teaching and provide feedback to them Yes ___ No ___
c) Work in teams Yes ___ No ____

How often have you done the following in your classroom? Check all that apply.

Never (1) Sometimes (2) Often (3) Very often (4) Non-applicable (N/A)

Used a textbook as a primary guide through units	1	2	3	4	N/A
Had many learning activities going on at the same time	1	2	3	4	N/A
Had students individually answer textbook or worksheet questions	1	2	3	4	N/A
Had students review and revise their own work	1	2	3	4	N/A
Had students self-assess their work	1	2	3	4	N/A
Had students engage in group research activities	1	2	3	4	N/A
Invited speakers/educators to your classroom	1	2	3	4	N/A
Used informal education resources (from museums, libraries, arts organizations, zoos and aquariums)	1	2	3	4	N/A

Experience with Technology

I have access to a computer: *Check all that apply*

___ At home
___ In my classroom
___ In the school library
___ In the school computer lab/media center
___ Other (please specify_____)
___ I do not have access to a computer

Do you have Internet access?: () Yes () No

If yes, check all that apply and indicate the level and nature of access at each point of access.

	Method of access to Internet Dial-up; ADSL, DSL, Cable Modem, T-1, T-3, Wi-Fi, other	Speed of access (56.6K, 128K, 256K, 521K, 1.1MBS+,d/n know)	What device do you use to access the Internet? (Desktop computer, wireless laptop, Cell phone, Blackberry, PDA, other)
At home			
In my classroom			
In the school library			
In the school computer lab/media center			
Other			

Other method and/or device to access Internet if not listed above (please specify_____)

How many years have you been doing the following? *Circle the best choice for each item*

	None	> 1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs.	10+ yrs.
a. Years using the computer in any way						
b. Years doing computer activities at school						
c. Years doing computer activities at home						
d. Years using tele-communications (e.g. email, Internet) at school						
e. Years using tele-communications e.g. email, Internet) at home						

How often do you engage in computer activities for your classes?

___ Every day
___ A few times a week
___ A few times a month
___ Once a month
___ Every few months
___ Never

Which of the following types of software do you use in your classes? *Check all that apply*

___ Word processing (e.g. MS Word, Word Perfect)
___ Database software (e.g. FileMaker, MS Access)
___ Spreadsheet software (i.e. Excel)
___ CD-ROM software (e.g. encyclopedias, educational games)
___ Drawing or painting software (e.g. Flash; KidPix)
___ Desktop publishing (e.g. Quark, PageMaker)
___ Presentation tools (e.g. PowerPoint, HyperStudio)
___ Image-editing (e.g. PhotoShop)
___ Programming language (e.g.HTML, Java, C++)
___ Authoring software (e.g. AuthorWare, MacroMedia Director)
___ Web Page Editors (e.g. MS FrontPage, Claris HomePage)
___ Internet Browsers (e.g. Internet Explorer, Netscape Communicator)

___ Email (e.g. MS Outlook, Eudora)
___ VCR

If you use the above applications in your teaching please describe how you integrate this technology into your curriculum.

_____
_____

Distance Education Experience

Do you have any experience with video-conference based Distance Education beside the SeaTrek program?
Yes _____ No _____ If no, please go to Question #
Were you taking or teaching the video conference-based Distance Education course?
Taking _____ Teaching ___
Were you involved in any distance education programs that offered any of the following?

Features of Distance Education	Yes	No
Offering courses in areas not otherwise available in the school		
Compensating for teacher shortages in certain subject areas		
Offering AP courses		
Offering a new learning environment for remedial or at-risk students		
Serving Special Education Students		
Serving gifted students		
Permitting students who have failed a course to take it again during the second semester or over the summer		
Serving homebound students		
Allowing students to fit more courses into their schedules		
Reducing scheduling conflicts for students		
Addressing growing populations and limited space		
Enrichment		
Electronic Fieldtrip		
Other		

If other, please specify_____.

Teacher's experience with the SEATREK Project

How did you hear about the SEATREK Project? _____
Have you participated in any professional development related to Sea Trek?
Technology Yes ___ No ___ ___
Video conferencing Yes ___ No ___ ___
SeaTrek Web site Yes ___ No ___ ___
Who provided this professional development? _____
Including the current year, how many years have you taken part in the SEATREK Project?
___ This is my first year
___ This is my second year
___ This is my third year
___ This is my fourth year
___ This is my fifth year
___ This is my sixth year
With the SEATREK Project, are you part of a teaching team? Yes ___ No ___
Does your Information Technology Person (ITP) provide you with enough support in the use of SeaTrek video-based Distance Learning sessions? Yes ___ No ___
Has your ITP given you any assistance in integrating the SeaTrek materials into your regular teaching?
Yes ___ No ___
If you know and have participated in the following professional development components of SEATREK, please rate the usefulness of the SEATREK professional development components on a scale of 1 to 4, with 1 being "not useful" and 4 being "extremely useful".

	Not Useful			Extremely Useful	N/A
Technology training	1	2	3	4	___
Technical support for videoconferencing and connectivity	1	2	3	4	___
SEATREK supporting website	1	2	3	4	___

I didn't take part in SEATREK professional development _____

If you do not take part in SEATREK's professional development, why not? (Check all that apply by ranking them from 1 to 7, with 1 being the "most important reason" and 7 being the "least important reason.")

___Don't have enough time
___No online access
___Not offered in my area
___Not required by my school district or state
___I understand how to implement SEATREK without the training

___Other_____

Teacher's current experience with the SEATREK curriculum

Have you used SEATREK instructional materials this year? Yes __ No ___

(If you answer 'no,' skip to question X)

How many weeks have you used the SEATREK project during the current school year?

___Less than one week
___1 – 2 weeks
___3 – 5 weeks
___6 –10 weeks
___10 – 20 weeks
___More than 20 weeks

How often did you use the SEATREK Project?

___Every day
___2 – 3 times a week
___Once a week
___Less than once a week
___Less than once a month

Which SEATREK instructional materials have you used this year? (Check all that apply).

Unit	Videoconference	Website Support Materials
Mammals, Mammoths, Manatees!		
Sharks – Devouring the Myths		
Mission See Deep: Remotely Operated Vehicles		
Sea Turtles – Amazing Reptiles of the Sea		
Coastal Habitats		

Do the SEATREK instructional materials help you meet the following objectives? (Please rate from 1 to 4, with 1 being "not helpful" and 4 being "very helpful.") (Check all that apply).

	Not helpful			Very helpful	N/A
Enhancing your ability to teach science content in an exciting way	1	2	3	4	____
Assisting you in meeting national or local educational standards	1	2	3	4	____
Helping you introduce web technology into the classroom	1	2	3	4	____
Helping you connect with current research and researchers	1	2	3	4	____
Providing useful assessment activities	1	2	3	4	____
Helping you network outside of the classroom	1	2	3	4	____

Do the SEATREK instructional materials help you:

Meet your district/school standards Yes ____ No _____
Meet state standards Yes ____ No _____
Assess student performance Yes ____ No _____
Prepare for testing Yes ____ No _____

How useful do you find the Standards Alignment Charts for lessons? (Please rate the usefulness of this tool from 1 to 4, with 1 being "not useful" and 4 being "very useful".)

Not useful			Very useful	N/A
1	2	3	4	___

Do the SEATREK instructional materials help your students learn more about:

How scientists work in teams Yes ____ No _____
How to learn using the Internet Yes ____ No _____
How to design science experiments Yes ____ No _____
How to solve problems Yes ____ No _____
How to present what they know Yes ____ No _____
How to work with multimedia Yes ____ No _____
Increase interest in Science Yes ____ No _____

Please rate the SEATREK instructional materials from 1 to 4, with 1 being "needs improvement" and 4 being "Does not need improvement."

	Needs improvement			d/n need improvement	N/A
Is of manageable length	1	2	3	4	___
Provides user-friendly structure	1	2	3	4	___
Teacher pages supply useful information	1	2	3	4	___
Includes easy-to-follow tables, graphs, and diagrams	1	2	3	4	___
Defines important vocabulary words	1	2	3	4	___

Activities are age appropriate	1	2	3	4	___
Assessment tools are applicable	1	2	3	4	___

If you don't use the SEATREK instructional materials, why don't you use it? (Check all that apply by ranking them from 1 to 5, with 1 being the "most important reason" and 5 being the "least important reason.")

SEATREK instructional materials are:

___Too difficult
___Too time-consuming
___Too expensive
___Don't work
___Other _____

Strengths of the Sea Trek Program

What do you think are the strong points of the Sea Trek program? Please rate the degree to which you agree with the following strengths according to the following scale:

1 – Stongly disagree
2 – Somewhat disagree
3 – No opinion
4 – Somewhat agree
5 – Strongly agree

Strengths of the Sea Trek Program	1	2	3	4	5
Most of the students really enjoyed the videoconference.					
The SeaTrek videoconferences are unique.					
The interactive component of the videoconference made my students become involved.					
The social interaction required during the show (being part of a research team, interacting with others, and working on a mutual goal) made for a unique and valuable educational tool.					
Students felt involved in something important beyond their classroom					
Connection with resources outside school helped low budget science program					
Use of technology to present information					
Real world project					
Sea Trek has a talented and dedicated staff					
My students felt the Sea Trek videoconferences had high educational value.					
The SeaTrek videoconferences were especially good for my students with little motivation.					
Te SeaTrek videoconference motivated my students to undertake scientific projects.					
Current and pertinent to Florida ecology					
Sea Trek programs enabled students to go into the 'real world' and see why learning is important.					
Sea Trek programs provided true 'scientist' learning experience by providing an opportunity to connect to information outside the classroom.					
Outside contact with science educators is valuable supplement to what is taught in the classroom.					
The field experience connected learning in the classroom with the students daily experience in coastal regions.					
What my students enjoyed most about the Sea Tek programs were content unit activities.					
My students enjoyed the Sea Trek program because they learned about their environment and what they can do to help.					
My students enjoyed the Sea Trek program because they learned how to tell if their beach is healthy.					
My students enjoyed learning about all the things that live in the ocean.					
I would like to see more SeaTrek video conferences woven in the curriculum.					
My students seemed to captivated by the story the scientists told.					
My students were really involved during the whole videoconference					

Please feel to add any other important strengths of the Sea Trek program that we have not listed in the space below:

_____
_____
_____

Which instructional units did your students like best? Please rate each unit on a scale from 1 to 5 with 1 being the least liked and 5 being the most liked:

Sea Trek Unit	Videoconference	Website Support Materials
Mammals, Mammoths, Manatees!		
Sharks – Devouring the Myths		
Mission See Deep: Remotely Operated		

Vehicles
Sea Turtles – Amazing Reptiles of the Sea
Coastal Habitats

Challenges for the Sea Trek Program

What do you think are the challenges for the Sea Trek program? Please rate the degree to which you agree with the following challenges according to the following scale:

1 – Strongly disagree
2 – Somewhat disagree
3 – No opinion
4 – Somewhat agree
5 – Strongly agree

Challenges for the Sea Trek Program	**1**	**2**	**3**	**4**	**5**
Sometimes it was hard to hear the speakers.					
My lack of understanding of how to use videoconferencing technology slowed up my students learning.					
The student reading sheets are very difficult to read and understand					
The videoconference needs to develop a more interactive format since there was too much lecture format to hold the interest of the students.					
There need to be more hands-on activities that deepen the understanding of the students.					
My students felt they had to wait too long to go out on the field trip.					
My students didn't like doing the writing assignment.					
Students felt there was too much to remember					
My students didn't like the reading associated with the program					
My students felt the videoconference was a kind of entertainment with little educational value.					
Reading a book about the topic areas would have been of equal educational value to my students.					
I do not believe entertaining media, in general, can contribute in any way to education.					
The videoconferences were too challenging to most of my students.					
Only my very smart students could follow the videconference.					
The SeaTrek videoconference does not fit into my curriculum					
I am not convinced that a student will be more interested in science after the videoconference.					
Considering the amount of time and money spent to produced the videoconference, I prefer to stick to traditional educational toosl					
I did not see anything really new or original about the SeaTrek videoconference.					
I am afraid that my slower students will not be able to complete the hands-on activities.					

Please feel to add any other important challenges for the Sea Trek program that we have not listed in the space below:

_____
_____

Next Steps for the Sea Trek Program

What are the next areas in which you believe the Sea Trek program should develop. Please use the space below to suggest areas for future development:

_____
_____

School Profile Checklist

DATE ..... RESEARCHER(S) .....
NAME & LOCATION OF SCHOOL .....
SCHOOL/DISTRICT WEBPAGE .....
SCHOOL REPORT CARD (YEAR) .....
We would appreciate it if you could provide us with literature or simply provide us with information about the following:

GENERAL SCHOOL DEMOGRAPHICS

1) Number of students in school
2) Number of FTE teachers in the school
3) Spending per pupil
4) Average class size
5) Number of students in free/reduced price lunch program
6) Average student attendance
7) Ethnic/racial make-up of student body
8) Average number of years teaching experience of faculty; teacher certification statistics
9) Percentage of students with labeled physical or learning disabilities
10) Mobility/transience (students; teachers)

COMMUNITY/DISTRICT

- Population of community served by the school
- Number of students in district
- Number of elementary, middle and high schools in the district
- Examples of parental involvement (PTA membership, programs organized by parents, etc.)

TECHNICAL INFRASTRUCTURE

a) Number of computers in the school
b) Type of computers in the school (PC, Macintosh)
c) Average age of computers in the school
d) Location of computers in school (how many in labs, classrooms, media centers)
e) Type of internet connectivity (i.e. only in library/lab, in classes, in some classes)
f) Distribution of internet connectivity (i.e. only in library/lab, in classes, in some classes)
g) Staff development in technology
h) Technical support staff? (what's it like, in brief?)
i) Is there a science lab? Describe the science facilities briefly.

SCIENCE PROGRAM

- What's the overall science program/curriculum in school/district, in addition to SeaTrek?
- What are the state science standards like for the grade in which SeaTrek is taught?

SCHOOL ACHIEVEMENT

- Overall school performance on standardized tests relative to other schools in the state.
- Any new standards/tests implemented in the past two years
- Any new/significant initiatives or reforms being implemented

DESCRIPTION OF SCHOOL

(a) Outside
(b) Inside
(c) Offices
(d) Classrooms
(e) People

DESCRIPTION OF COMMUNITY

(a) Rural/urban/suburban
(b) Ethnic
(c) Home life, single parent families, etc.
(d) Are students all from local community or are some bused in?
(e) Parental involvement in school
(f) General look/feel

NOTE: Try to find out about teachers who use or have used SeaTrek: how many teachers are involved, how long they have been involved, what are the successes and challenges, etc.

Classroom Observation Protocol

Date: _____ Observer: _____

Teacher's Name: .....

School/Location: .....

e.g., Monroe Middle School/Hatch, NM

Grade/Course Name .....

e.g. 6th grade science class; 2nd grade class

Sea Trek Program Title .....

Goals of activity (if stated by educator) .....

Total number of students: _____

Females _____ # Males _____

Brief description of students:

Surmised race/ethnicity of students (number):

African American / Black (_____)

Asian American (_____)

Hispanic / Latino (_____)

Native American (_____)

Caucasian (_____)

Other: _____ (_____)

Sketch of Classroom (indicate location of students, teacher, technology and other resources):

#	Time Strt	Description of Activities *Observations…*	*Comments…*	Quick Code Summary* (check if occurring)
				o S: working in groups o S: groupwork with tech o S: design/produce w/ tech o S: research w/ tech o S: communicate w/ tech o S: presenting/teaching --- o T: lecturing o T: Introducing concepts o T: open-ended questioning o T: demoing tech o T: reviewing/reflecting o T: guiding exploration o T: adapting to stu needs o T: consulting stu grps --- o ST: video o ST: hands-on activity o ST: tech: digital lab o ST: tech: message board/chat o ST: research o ST: Science o ST: Math o ST: Lang Arts
				o S:working in groups o S:groupwork with tech o S:design/produce w/ tech o S:research w/ tech o S:communicate w/ tech o S:presenting/teaching --- o T: lecturing o T: introducing concepts o T: open-ended questioning o T: demoing tech o T: reviewing/reflecting o T: guiding exploration o T: adapting to stu needs o T: consulting w/ stu grps --- o ST: video o ST: hands-on activity o ST: tech: digital lab o ST: tech: message board/chat o ST: research o ST: Science

				o ST: Math o ST: Lang Arts
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ADDITIONAL NOTES