Distance Learning Programs at the Saint Louis Zoo

Focus Groups with Teachers of K-12 Students with Disabilities

Conducted for
Saint Louis Zoo
St. Louis, Missouri
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Executive Summary

The evaluation study supports the project *Distance Learning Education Programs at the Saint Louis Zoo*. To better understand what teachers want and need, and the characteristics of the settings in which their students learn, the Zoo conducted an online survey of the teachers of students with special needs in May 2014. The purpose of this evaluation was to clarify and expand the survey findings to support the design, development, and implementation of the Zoo distance learning curriculum so that it works effectively across a variety of school settings for K-12 students with special needs and their teachers. Carey Tisdal of Tisdal Consulting was contracted to conduct four focus groups to explore the several overarching questions. Findings, conclusions, and recommendations are organized around these questions.

Methodology and Methods

The overarching methodology I used to design and conduct this study was naturalistic inquiry (Lincoln & Guba, 1989). Focus groups were recruited and conducted according to procedures and guidelines recommended by Krueger (2009). Respondents were selected purposively (Miles & Huberman, 1994), which means we recruited respondents based on characteristics that were important to answering the questions of the study. A total of 26 respondents were interviewed between November 17 and November 27, 2014, in four focus groups organized to group respondents who work with students with specific disabilities:

- Group 1: Physical and mental disabilities (Grades 6 to 8);
- Group 2: Autism, Low Functioning;
- Group 3: Physical and mental disabilities (Grades K to 5); and
- Group 4: Autism, High Functioning

The respondents in these four focus groups were primarily very experienced female teachers and professionals working in a range of settings. Settings included St. Louis County and St. Louis City public schools as well as one private school and three nonprofits serving people with specific disabilities. All St. Louis County teachers appeared to be associated with the Special School District (SSD) but identifying information was not entirely clear. Most teachers worked with students with a range of disabilities; a few, however, worked only with young people with autism, hearing impairment, and visual disabilities.

Summary of Findings, Conclusions, and Recommendations

What are teachers looking for when they select a Zoo distance learning program?

Selecting and Rejecting Programs

Respondents provided some very some very clear criteria about what they are looking for in selecting distance learning programs. They want programs that:

- Fit their curriculum
- Provide appropriate physical activity
- Include opportunities for connections to life and life skills
- Seem age-appropriate in content and activities
- Appear exciting and interesting
- Include appropriate interactivity
- Involve cross-curricular content
- Provide exposure to live animals
- Suggest activities for follow-up
- Provide concrete examples of concepts they are teaching

Respondents in these group rejected programs that:

- May create issues for students with specific disabilities
- Contained no apparent connection to their curriculum
- Did not appear to be a special experience
- Included concepts they judged too abstract or complicated for their students
- Suggested prior life experience was needed that their students do not have

In general, the highly structured, brief program descriptions appeared to work well for respondents to scan information quickly and reach a reasoned decision. Some tweaks to the description are supported by the findings in this study. Text descriptions of programs should be carefully reviewed to see if they clearly provide the information teachers are looking for. Both criteria for selecting and rejecting programs should be considered along with more detailed information about what the criteria mean from the Findings section.

Respondents wanted pricing presented for each of the programs, along with the other information. If that is an issue for website maintenance, then the prices should be removed from the two items on which they appear.

Respondents also asked for the name of a contact to call to ask additional questions about the program. Even more than teachers working with developmentally normal students, teachers of students with disabilities appear very careful in selecting appropriate experiences for their students. I interpreted this and other recommendations for communication with presenters as a request for the Zoo staff members to personally be their partners in meeting their students' needs.

The Distance Education department should also consider producing short clips (three to five minutes) in which the presenter(s) introduce themselves and preview what will happen in the program. These clips need to appear online so teachers can use them to clarify the nature of the videoconference and to prepare students for the program.

Cost of Programming

Based on information from respondents in these four focus groups, cost may provide the strongest barrier preventing use of videoconferences in schools with students with disabilities. Yet this situation is neither straightforward nor simple. Cost is important because funds for videoconferences are not in teachers' classroom budgets. They have to make the case to one or more sets of stakeholders and decision makers to obtain the funds to offer a videoconference. This effort includes:

- Making a case to building principals or SSD coordinators to obtain funding
- Writing grants for pools of internal monies
- Writing grants to foundations or charities
- Raising funds on public websites.

Teachers need information in the program descriptions, video clips previewing the program, or through other resources to help make the case for using a videoconference with their students. Standards such as the Missouri Grade-Level Expectations (GLEs) are a very important part of this justification. Yet equally important is providing means, such as the video clips, to introducing those unfamiliar with videoconferences to what the experience would be like for students. In addition to video clips, the Zoo Distance Learning staff should consider collecting evidence about the impact of their videoconferences. Respondents indicated the importance of research-based curriculum and empirical evidence as another important piece in justifying expenditure.

Finally, a few teachers who have written successful grants for programs or have successfully raised funds on public websites could be asked to share their efforts. These could be available

on request by teachers who want to schedule a videoconference, or they could be summarized in a document providing tips on writing successful grants or developing successful web posts for donors.

What recommendations do teachers have about how to capture the attention of and maintain engagement with students with various types of special needs?

Items Teachers Want to Prepare for Videoconferences

The Findings section contains numerous recommendations directly from respondents about how to capture attention and maintain engagement. The most important conclusion that emerges from the analysis is that maintaining attention and engagement is not just about what happens during the videoconference itself. Particularly among students with disabilities, teachers need to prepare the young people for this experience so they can engage productively. This means the Zoo Distance Education staff needs to consider what materials are practical and possible to develop and share with teachers prior to videoconferences. The highest priorities appear to be vocabulary lists (five to 10 key words) and lists of items in boxes or kits. Responses from focus groups indicate these items are needed for all programs, and it would be helpful if they could be available online so teachers could review them as part of their selection process. Video clips introducing presenters would appear the next priority. Making these clips highly structured may make their production and utilization easier and more effective.

A Teachers' Guide and lesson plans are more ambitious undertakings. The staff time and effort to develop these materials, along with including expertise from professionals with special education curriculum development, could require additional funding outside the department budget. If such development is undertaken, the strategies used in the Unique curriculum (e.g., differentiated instruction), News-2-You, and Mayer-Johnson products could provide promising models. Special education as a field is based on considerable research, and curriculum developers would need to be familiar with and apply this research in the design of materials.

Maintaining Student Attention and Engagement

Respondents shared ideas about how to capture and maintain attention and engagement before, during, and after the program. Distance Education staff members at the Zoo can use can use some ideas and strategies to consider simple one-pagers for teachers to get them to think about how they would prepare pre- and post-activities for videoconferences. If time and budget allow, staff members can consider adding to vocabulary lists and lists of items in boxes for each program, and develop specific suggestions for each program. One way to prioritize this effort would be to look at the three most popular videoconferences selected by respondents in

the focus groups and start with these programs. Higher-priority programs would include *Fall into Winter*, *Critter Gardens*, and *Animal Champions*. Staff members should remember that all efforts making programs more effective and engaging programs for students with disabilities may be very useful for general education teachers, too.

Before the Program

Before the program, respondents suggested a variety of strategies to make this new experience (videoconferences) more comfortable and to pre-teach so their students could participate. Activities included:

- Learning vocabulary
- Hands-on objects
- Viewing pictures of animals involved and learning their names
- Watching video clips about the animals or topic
- Watching a video clip introducing the presenter and program topics
- Reading books and stories
- Researching the topic
- Writing and journaling to prepare to learn

During the Program

Respondents also had several suggestions about how to maintain attention and engagement during the program. These suggestions were about presenter style and techniques, pacing and structure, and length of the programs.

Zoo staff members should consider reviewing program scripts to see if these suggestions can be incorporated. In addition, tip sheets could be developed from this information about working with students with autism who are functioning at a low level.

Suggestions about presenter style:

- Be animated and enthusiastic with all students with disabilities.
- For students with autism who are functioning at a low level:
    - Be prepared keep moving on through the program even in the event of some bad language and a few meltdowns.
    - Use basic, simple language.
    - Give students processing time.
    - Use appropriate questioning techniques.
    - Prepare students for any surprises.
    - Recap and review during and at the end of the program.

Suggestions about pacing and structure:

- Have an agenda.
- Have a brain break or movement break halfway through programs.
- Recognize that programs could take a little longer for students with disabilities.

Activities respondents suggested:

- Use music and sounds.
- Provide materials for students at their desk to help focus their attention during the videoconference.

After the Program

Respondents across all four groups had suggestions for appropriate follow-up activities that would engage students and extend learning.

- Include hands-on experiences.
- Connect to someone at the Zoo for follow-up questions.
- Use activities to demonstrate learning.
- Have students participate in projects such as designing animals or making books.
- Encourage student writing and journaling.
- Consider video projects as a way to reflect on learning.

Recommendations about Materials for Boxes

Zoo staff members wanted recommendations from respondents about items to include in boxes sent to the school to accompany the videoconferences. Respondents recommended that items selected for boxes be hands-on, colorful, and interactive. Characteristics of items not to send in the box include those things that are easily broken, irreplaceable, and small enough to be placed in the mouth.

Respondents were not in complete agreement about some of their recommendations. One area related to authentic items. Some recommended real items such as furs and owl pellets. Others did not want fur because of allergies or the possibility of any real bones. There was also a range of ideas about whether multiple sets of items in boxes were needed. Some respondents requested multiple sets of items so students would not have to wait. Others believed sharing and waiting were appropriate social skills for students to develop.

What methods and program elements support the development of social and communication skills among students with special needs?

Respondents explained one reason they wanted their students to have the opportunity to participate in videoconferences was that it presented a framework though which they could learn and practice important communications skills, many of which could seem obvious to their normally developing peers. For students with autism, greetings and closures, taking turns, raising their hands, and listening quietly while someone else talks are all important social and communication skills. In addition, some students with autism needed to develop appropriate body language and practice eye contact. Respondents in other groups, particularly Group 2, focused on their students developing skills in formulating questions and taking turns asking questions to the presenter.

Videoconference developers and presenters need to be aware of these developing skill areas for students with disabilities. Most respondents said they would like direct communication with presenter(s) by email or phone prior to the videoconference. Zoo Distance Education staff members could consider developing a set of five or six question to ask teachers on the phone or by email. One of these questions could be about the social and communication skills the teacher is focusing on with a specific class.

What recommendations do teachers have about which zoo careers to highlight for students with various special needs?

In general, career education was a more important issue for respondents working with older students than younger students. Respondents working with older students could envision using a full program on jobs at the Zoo or working with animals. Some of their students have unrealistic expectations about what jobs are open to them but like the idea of working at the Zoo. It could benefit these older students to know about support jobs in the gift shop, janitorial areas, and food service. For younger students, short segments on jobs related to a topic, or the videoconference presenter describing his or her job and educational path, would be more appropriate. Respondents working with younger students did not appear interested in using an entire program on jobs and careers.

Zoo Distance Education staff members should consider the pros and cons of developing a videoconference about jobs at the Zoo. As one respondent noted, such a program could overwhelm the Zoo with job applicants. It may be that, considering its mission, committing this time and effort is not an investment the Zoo wants to make. On the other hand, starting to think about one- or two-minute sections of videoconferences that feature Zoo jobs, or even any

Zoo employees with disabilities, could be productive and make videoconferences more attractive to teachers.

To what extent and in what ways can the Zoo Distance Learning program support successful use of technology by teachers and students?

There appear to be some gaps between school districts with technology and technology support that would support videoconferences and those districts with less technology and support. Several wealthier County districts have higher levels of technology and support, and St. Louis Public Schools (SLPS) and some of the less wealthy County schools have lower levels. Barriers to using videoconferences beyond technology and technology support appeared to be restrictions to installing software, unreliable service or narrow bandwidth, and incorporating augmented communication devices into the videoconference exchanges. Teacher comfort appeared closely connected to level of support, and most respondents placed a high priority on an equipment test prior to the videoconference to make certain everything was working. Only respondents with students with autism functioning at a low level wanted a test experience to prepare their students for the videoconference. Respondents rated their students' comfort with technology close to that of their age-group peers.

Zoo Distance Education staff members should develop a set of five or six questions, one of which clearly asks teachers about the types of technology and technology support available. Since respondents received free videoconferences as an incentive for participation, I strongly recommend that staff members involved in testing programs and presenting programs write brief formal debriefs after each teleconference, including the school district and other organizational setting, citing of any problems or issues, and making any recommendations about technology support. Debriefs such as these could provide a set of ongoing records to inform decisions about how to support teachers and districts that may require the greatest level of support.

Of what specific considerations does the Zoo Distance Learning staff need to be aware in designing and conducting distance education programming for students with different types and levels of disabilities?

This focus group pointed to several areas where Zoo Distance Learning staff members need to consider in designing and conducting programs for students with disabilities. First, it may be necessary to engage with greater levels of communication with teachers of students of disabilities than with general education teachers. Special education teachers appear highly attuned to the individual differences among their students and the overall chemistry these differences provide the class as a group. Presenters will probably be most successful and

comfortable if they have a discussion, by email or phone, and work with the teacher as a partner.

Second, it appears that student with autism functioning at a low level may be the most challenging for Zoo Distance Learning staff to work with and meet their needs. I highly recommend that before embarking on videoconferences with these students that staff members follow respondents' advice and visit these classrooms with an eye to doing videoconferences. Unlike regular outreach programs, videoconferences could require at least some adaptation to allow communication with augmented communication devices. Both teachers and presenters would need to pre-plan parts of the videoconference where this communication would work and carefully structure it. Videoconferences with these students could be wonderful experiences, but they will require the expertise of the teacher as well as presenters who want to develop their own expertise.

Zoo staff members may also need to consider that working with K-4 students with physical and mental disabilities may involve a greater focus on developing oral and written communication skills than on science curriculum. Again, close collaboration with teachers is recommended.

Additional time may be needed for students with all types and levels of disability. Many of these students can accomplish the same things as their age group peers, but it may take them longer. Time should be allotted for additional communication, preparation, and actual engagement online with the students.

Finally, Zoo Distance Learning staff members may want to consider ways to build their own knowledge and expertise in working with students with disabilities. Field trips to classrooms could be considered, along with reading articles and staff meeting discussions. Creating opportunities for summer internships for special education teachers could be another way of increasing the funds of knowledge and expertise to develop memorable and engaging experiences for young people with disabilities.

Introduction

The evaluation study supports the project *Distance Learning Education Programs at the Saint Louis Zoo*. With funding from The Tilles Foundation, the Saint Louis Zoo (Zoo) is adapting and redeveloping distance learning programs to better meet the needs of students with special needs. Another goal of the project has been the creation of a dedicated space for distance learning programming.

To better understand what teachers want and need, and the characteristics of the settings in which their students learn, the Zoo conducted an online survey of the teachers of special needs students in May 2014. The Zoo sent survey requests to 550 teachers who work with special needs students and received 156 responses for a return rate of 28.36%. While the survey provided very useful information, the Distance Learning staff members had additional questions and want a more detailed explanation about some of the areas of inquiry. Focus groups were an appropriate method to answer these questions and get a deeper understanding from teachers about the special needs of students. I, Carey Tisdal of Tisdal Consulting, was contracted to conduct four focus groups to explore this topic.

The purpose of this evaluation is to clarify and expand the survey findings to support the design, development, and implementation of the Zoo distance learning curriculum so that it works effectively across a variety of school settings for K-12 students with special needs and their teachers.

Based on initial discussions with Zoo Distance Learning staff members, the study explored the following overarching questions:

1. What are teachers looking for when they select a Zoo Distance Learning program?
2. What recommendations do teachers have about how to capture the attention of and maintain engagement with students with various types of special needs?
3. What methods and program elements support the development of social and communication skills among students with special needs?
4. What recommendations do teachers have about which zoo careers to highlight for students with various special needs?
5. To what extent and in what ways can the Zoo Distance Learning program support successful use of technology by teachers and students?

6. Of what specific considerations does the Zoo Distance Learning staff need to be aware in designing and conducting distance education programming for students with different types and levels of disabilities?

Appendix A includes a topical framework organized around these overarching questions. A topical framework is a method used by Tisdal Consulting to set forth in question form the topics that the study will explore. Major questions also guided the organization of findings in this final report. The topical framework includes specific questions related to each of these six overarching questions.

Methodology and Methods

The overarching methodology I used to design and conduct this study was naturalistic inquiry (Lincoln & Guba, 1989). In this methodology, appropriate for studies using qualitative approaches, detailed data analects are presented to allow readers to see how conclusions were reached and to understand the meaning of the findings. Conclusions are reached by triangulating data from multiple sources that, in this design, consist of four focus groups with contrasting sets of respondents.

After discussion with the project team, we decided to conduct four focus groups to explore the overarching questions. Focus groups were recruited and conducted according to procedures and guidelines recommended by Krueger (2009). Respondents were selected purposively (Miles & Huberman, 1994), which means we recruited respondents based on characteristics that were important to answering the questions of the study. Characteristics of teachers were identified from a survey previously conducted by the Zoo and included types of disabilities and grade levels among the children they taught. Table 1 shows the composition and number of teachers in each of the four groups. (Some teachers who were recruited and scheduded did not attend providing fewer numbers and voices some categories.)

Table 1. Focus Groups

Group	Date	Teachers of children with . . .	Number of Respondents
Group 1	November 17, 2014	Physical and mental disabilities (Grades 6 to 8)	4
Group 2	November 17, 2014	Autism, low functioning	7
Group 3	November 20, 2014	Physical and mental disabilities (Grades K to 5)	6
Group 4	November 20, 2014	Autism, high functioning	9
Total			*26*

I developed sample recruitment materials including phone scripts, email templates, and a short screening questionnaire. Amy Niedbalski, Manager, Audience Research, recruited respondents. Outreach Coordinator Kimberly Hoormann organized facilities and incentives.

Data Collection and Analysis

I used a focus group script to present similar questions to each of the four groups. Probes, clarifications, and follow-up questions varied by group to explore specific differences and subjects of relevance to the topic in each group. Appendix B includes the focus group script. Participants responded orally and on paper. I developed a response sheet to allow teachers to read through program descriptions and pricing information, and to identify at least two programs they definitely would and would not select. Appendix C shows the response sheets that teachers used.

I analyzed transcripts through content analysis using NVivo computer software. I developed a broad coding scheme from the questions in the topical framework (Appendix A). After identifying sections of the interviews relevant to these code topics, I explored answers to the questions by developing codes directly from the transcript data. Developing codes directly from the natural language of the respondents is called grounded theory (Glaser & Strauss 2009). I calculated descriptive statistics for (1) characteristics of respondents; and (2) questions related to program scheduling and criteria using Excel and NCSS software.

Procedures for Confidentiality and Security

Prior to each focus group, I explained purpose, method, and procedures to respondents and provided a written informed consent form for them to read. Respondents signed the form prior to the collection of any data. Focus groups were audio-recorded. A medical and legal transcriptionist accustomed to maintaining secure records and confidentiality transcribed audio recordings. Transcripts, handwritten notes, response forms, and debriefing documents became part of the data set for each focus group. Electronic files (transcripts and debriefing documents) are maintained in a secure database at Tisdal Consulting.

Limitations

This study has a few limitations. First, some focus groups included respondents whose characteristics did not match those of the others in the group. For example, a teacher of primary students with physical and mental disabilities attended Group 1, where other respondents worked with students with physical and mental disabilities in grades 6 through 8. There were other instances of respondent-group mismatch. Also, it is not possible to identify all speakers individually in focus group transcripts, which means one cannot draw one-to-one connections between the grade and disability listed in the focus group name and respondent comments.

This same characteristic of focus groups—that it is not always possible to identify speakers individually—is connected to another limitation: Optimally, it would have been good to make connections between school districts and other work settings and some of the responses (e.g. those describing levels of technical support). But such connections were not always possible.

In general, these limitations are minor, and the groups produced good information upon which to develop findings, draw conclusions, and support recommendations.

Characteristics of Respondents

A total of 26 respondents participated in four focus groups. Tables 2 through 5 show the characteristics of these respondents.[1] There were 25 female respondents and one male. The most frequent level of experience (years worked) was 11 to 20 years, indicating a very experienced group of teachers.

Respondents worked in a wide range of St. Louis County public schools; most of these County teachers were associated with the Special School District (SSD). The SSD provides special education services across the 22 school districts in St. Louis County as well as additional services to students in parochial schools and those who are home schooled. Groups 2, 3, and 4 had one respondent each from the St. Louis Public Schools. Also represented were individuals from nonprofit organizations that work with people with autism and those who are hearing impaired and visually impaired.

Focus groups were organized to explore the needs of students with specific type of disabilities; most teachers among the respondents, however, work with students with a variety of disabilities. Teachers as well as individuals working in nonprofits noted that some of the young people they work with have multiple disabilities, which means classroom management for many videoconferences will need to adapt to and accommodate students with a range of disabilities as well as those with multiple disabilities. In addition, while the focus of each group was clearly presented, respondents all in all tended to provide at least some examples from children with a range of disabilities, some of which appeared outside the focus group definition. This viewpoint, considering the range and mix of individuals in a classroom, may be important for the Zoo Distance Education staff to adopt in working with teachers to identify special adaptations needed for specific classes.

[1]Respondent characteristics, where available, were developed from survey information provided by the Zoo. When this information was not available (e.g., an individual attending had not responded to the survey), the missing data was supplemented from respondent descriptions in the focus groups of themselves and their work settings.

Table 2. Group 1—Physical and Mental Disabilities (Grades 6 to 8)

CASE	Gender	Years Worked	Grade Level	Autism, High	Autism, Low	Physical	Mental	Setting
3	Female	More than 20 years	K-12				1	Nonprofit (Downs syndrome)
6	Female	11 to 20 years	4- 6			1	1	Jennings School District
7	Female	11 to 20 years	5-12	1	1		1	Private (Academy of St. Louis)
8	Female	Missing	7-8					SSD

Table 3. Group 2—Autism, Low Functioning

CASE	Gender	Years Worked	Grade Level	Autism, High	Autism, Low	Physical	Mental	Setting
9	Female	More than 20 years	K-5	1	1	1		Rockwood
10	Female	Six to 10 years	K-5	1	1			SSD (Rockwood)
11	Female	More than 20 years	1-4	1	1	1	1	SSD (Lindbergh)
12	Female	Six to 10 years	6-7		1			SSD (Southview)
14	Female	11 to 20 years	3-6	1	1			St. Louis Public Schools
16	Male	11 to 20 years	6-9		1		1	Kirkwood
17	Female	Missing	9-11		1	1	1	Hazelwood

Table 4. Group 3—Physical and Mental Disabilities (Grades K to 5)

CASE	Gender	Years Worked	Grade Level	Autism, High	Autism, Low	Physical	Mental	Setting
18	Female	11 to 20 years	K			1	1	Archdiocese of St. Louis
19	Female	Six to 10 years	1-12			1		Nonprofit (visually impaired)
20	Female	11 to 20 years	K			1		Nonprofit (hearing impaired)
22	Female	More than 20 years	1-3	1		1	1	Lindbergh
24	Female	One to five years	K -6		1		1	Ferguson-Florissant
25	Female	11 to 20 years	1-5		1		1	St. Louis Public Schools

Table 5. Group 4—Autism, High Functioning

CASE	Gender	Years Worked	Grade Level	Autism, high	Autism, low	Physical	Mental	Setting
27	Female	More than 20 years	9-12	1				Kirkwood
28	Female	11 to 20 years	K-2	1			1	University City
29	Female	Six to 10 years	K-6	1	1		1	Ferguson Florissant
30	Female	11 to 20 years	7-12	1		1	1	Rockwood (SSD)
31	Female	11 to 20 years	7 -12	1	1	1	1	Ritenour High School
32	Female	Six to 10 years	K -5	1			1	Parkway
33	Female	More than 20 years	7-8		1		1	Ferguson-Florissant (SSD)
34	Female	More than 20 years	K-5	1			1	St. Louis Public Schools
35	Female	More than 20 years	K-adults	1	1			Nonprofit (autism)

In summary, the respondents in these four focus groups were primarily very experienced female teachers and professionals working in a wide range of settings. Settings included St. Louis County and St. Louis City public schools as well as one private school and three nonprofits serving people with specific disabilities. Most St. Louis County teachers appeared to be associated with the SSD, and most teachers on the whole worked with students with a range of disabilities.

Discussion of Findings

Selecting Distance Education Programs

This section includes findings related to the overarching question "What are teachers looking for when they select a distance education program?" Distance Education Zoo staff members were interested in finding out what information teachers need to select a program so that staff can update the existing information on the Zoo website. In addition, staff members were particularly interested in the relative importance of Missouri Science Grade-Level Expectations (GLEs) and pricing information in the selection process. Findings related to three aspects of this question are presented:

- Reasons for Selecting and Rejecting Programs: Looks at the reasons teachers gave for both selecting and rejecting existing programs based on program descriptions.
- Importance of Curriculum Standings: Explores the relative importance to teachers of the curriculum standards that are currently presently for each program.
- Cost of Programming: Considers the relative importance of the cost of programming in teachers' deciding whether to use a Zoo videoconference with the students in their classroom.

Reasons for Selecting and Rejecting Programs

Findings address two questions, among others, in the Topical Framework (Appendix A).

- What specific elements do teachers look for in program descriptions that help them decide a distance education program would be appropriate for their students?
- Ideally, what are the big things a distance education program should cover and include to make it work for students with special needs (e.g., positive interaction with animals)?

The Zoo website provides information about Videoconferencing Programs. An introduction presents the general content and the nature of the experience, requirements for scheduling (including links to technical information), an explanation of connections to the National Science Education Standards (NSES), a link to a PDF with pricing information, and contact information (phone number and email for the Outreach Coordinator). Figure 1 shows the Videoconferencing Programs page on the Zoo website.

Figure 1. Snapshot of website information about Videoconferencing Programs at the Zoo

The website also provides descriptions of each videoconferencing program, containing a title, grade-level range, program length, text summary, and the Missouri Science GLEs addressed by the program. Two of the program descriptions (*Critter Calls* and *Baby Animals*) include pricing information. (Pricing for other programs is provided on a linked PDF.) Figure 2 shows the description *Zoo Clues,* which does not include pricing information; Figure 3 shows *Critter Calls,* which does include pricing information.

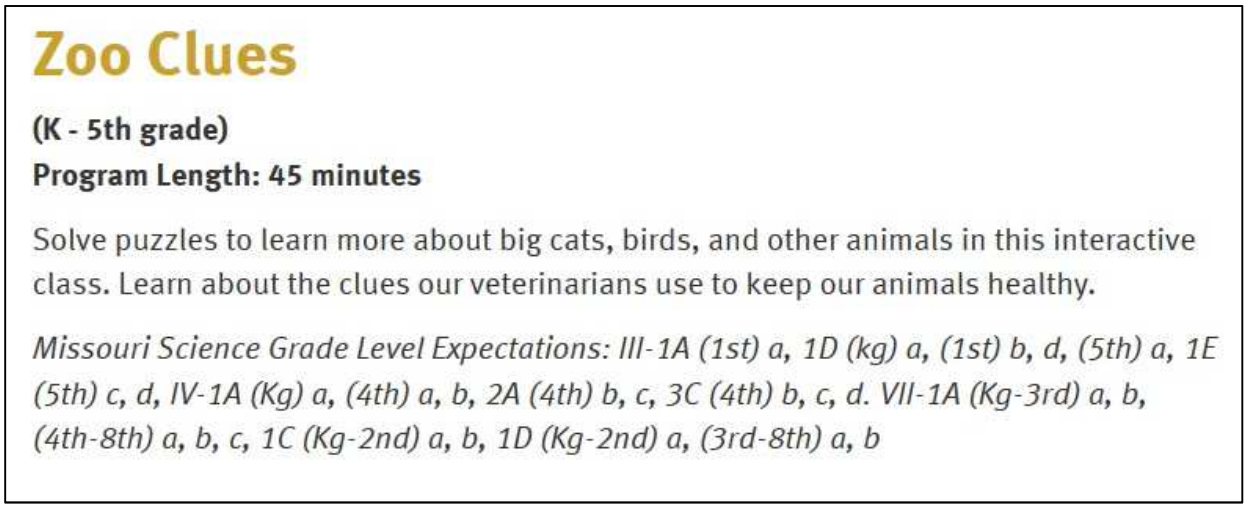


Figure 2. Program description for Zoo Clues

Figure 3. Program description for Critter Calls

Early in the focus group, I asked teachers to review the program descriptions provided on the response forms (Appendix C) and mark two programs they would definitely use with their students and two they would definitely not use. Then respondents were asked to give reasons for their selections. The purpose of this exercise was to elicit the criteria respondents used for selecting or rejecting programs. There were both similarities and differences among groups.

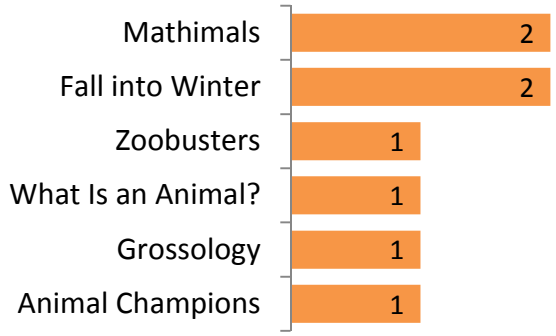
From observing the respondents marking their selections and quickly making decisions, it appeared that the length and organization of the information worked well in allowing them to consider a range of options. In evaluating direct quotes, Zoo staff members will want to make judgments about whether some of the information was so brief as to be misleading.

As respondents explained their reasons for selecting or rejecting specific programs, it became clear they were making complex decisions based a wide variety of criteria. Most of these respondents would use distance learning programs with children with several types of disabilities at the same time. Even young people diagnosed with similar disabilities may behave in different ways. Also, teachers considered the curriculum required by the State of Missouri, assessment methods, curriculum activities with which they were familiar, age level, functioning level, and how students learn. In addition to considering the academic and learning issues all teachers face, these special education teachers were also scanning the programs to find ways to develop social skills and communication skills that would allow their students to function well both at home and at school, and to connect what they were learning in school to their daily lives. To simplify their reasons into one-phrase criteria is useful, but these uses can hide some underlying differences. The reasons or criteria—I am using the terms interchangeably—can provide insight into the types of information teachers need to find programming that works for their students.

Group 1: Physical and mental disabilities (Grades 6 to 8)

Group 1 had only 4 respondents, and it was the first group conducted. Surprisingly, it was the only group in which the exposure to live animals was explicitly given as a reason for selecting a program. Unlike Groups 2 and 4, these respondents worked with students with a relatively small age range but with a relatively large range of disabilities.

Selection Criteria



Reasons given for selecting programs:

- Fits curriculum
- Cross curriculum-content
- Age-appropriate
- Exciting and interesting
- Life and life skills
- Appropriate physical activity
- Exposure to live animals

Figure 4. Programs selected and reasons given (criteria) (N = 4 respondents)

Figure 4 shows a summary of the programs selected and reasons among Group 1 respondents. *Fits the curriculum* was the most frequently given reason for selecting a program among Group 1 respondents. They cited this criterion in selecting the programs *Fall into Winter* and *Mathimals*. As one explained:

> *Fall into Winter and also the spring [Spring into Summer] because that's also part of the curriculum. We talk about the seasons, weather, and I think that will be a good way to incorporate other science topics with the animals. . . . For my students, the fifth graders are the ones doing the actual science piece of the alternate assessment. But all of the kids have been exposed; this is kind of their first experience with science and social studies and moving beyond just basic skills. (Group 1 respondent)*

The *cross-curriculum content* feature of *Mathimals* also made this program a popular selection.

> *I loved the idea of the Mathimals incorporating the curriculum into the program and doing a little bit of a mix. It just sounded—because it brought in Math, you were bringing in Math with how much elephants eat—yeah, you could even do the animal exhibit designed to scale. All that stuff just incorporates and supports our curriculum, Math curriculum. I just love the crossover. (Group 1 respondent)*

One respondent chose *Grossology* because it was *age appropriate* and *exciting and interesting*

> *I did yes for the new Grossology one, just because that was like so appropriate for teenagers. I think teenagers would totally get into the whole concept of what animals do that are gross. . . . I can just see my boys would be all over that whole theme. It's very teenage appropriate. It would just be an extension of the learning that's always going on in the classroom and getting my students more involved and more excited about learning. (Group 1 respondent)*

Life and life skills connections were also important to respondents in this group. One respondent explained why she selected *Grossology*:

> *I mean if you're dealing with middle school and high school boys . . . . They come in from break and it's deodorant, drinks and bathroom, literally. Just because they smell, they need to go to the bathroom and they need to get a drink. So I mean this just would hit home because they're constantly talking about things that come out of them, go in them, how they come out. I mean it's just a fact of life for boys. (Group 1 respondent)*

Another respondent selected *Fall into Winter* because she could use it to tie into some important life skills.

> *Because what I like is the Fall into Winter you'd be talking about that animals can have coats and that's why we wear a coat and we can start talking about dressing with our kids and life support and for our kids who wear coats and hats and et cetera. Because our kids have difficulties with—that you don't wear shorts in the winter, they don't have that concept. So that's something that you can relate with the animals back to our own students. (Group 1 respondent)*

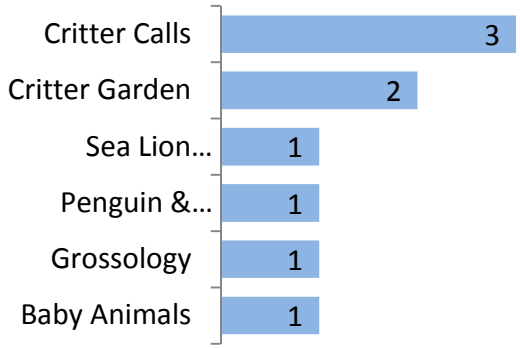
Another respondent selected *Animal Champions* because it could incorporate some *physical activity* into her classroom.

> *I liked Animal Champions because I just imagine that being another way that we could emphasize physical activity and exercising and it could be therapeutic—it could potentially be therapeutic working on gross motor and stuff like that for some of our kiddos. (Group 1 respondent)*

One respondent selected *Live Animals* because it provided a *special experience* for her students and *exposure to live animals*.

I chose What Is an Animal? . . . A lot of the kids in Jennings that I've worked with might not have had a lot of exposure to animals, other than pets at home, cats and dogs. Beyond that, they don't fully understand the range of animals that are out there. So I think What Is an Animal? will be good for them. (Group 1 respondent)

Rejection Criteria



Reasons given for rejecting programs:

- No apparent connections to curriculum
- Not a special experience

Figure 5. Group 1 programs rejected and reasons given (criteria)

Figure 5 shows a programs rejected and the reasons among Group 1 respondents. Only one reason Group 1 respondents gave for rejecting programs paralleled selection criteria. All others raised new topics.

Some respondents explained they had rejected programs that they found interesting and exciting but that they did not see as a connection to their curriculum, particularly one they could justify.

It was difficult, but I chose the Sea Lion Sound and the Penguin and Puffin Coast only because they were so specific that I would kind of like my kids to be exposed to something a little more general to cover more topics hopefully. (Group 1 respondent)

I [said no to] the Grossology and the Critter Calls. That's just because I think [these programs would be] supplemental to curriculum, we would really want to be able to show that it was going to be improving educational outcomes or improving what they're learning in school already. So I think those two just seemed like maybe they didn't have as much concrete lessons in them. (Group 1 respondent)

Other respondents in this group rejected programs primarily because they were looking for something that was a *special experience* for their students, not something they would experience at school or at home.

> *I [said not to] Critter Calls and Critter Garden, and my main reason was that they're so basic, that I wouldn't pay the money for those because it's something that we do—I mean most parents do at home, animals sounds, that type of thing. The Critter Garden was playing with stickers, matching pictures, that's all stuff that you could easily do in your classroom or you do at home that you wouldn't have to pay for a program to come and do that. (Group 1 respondent)*

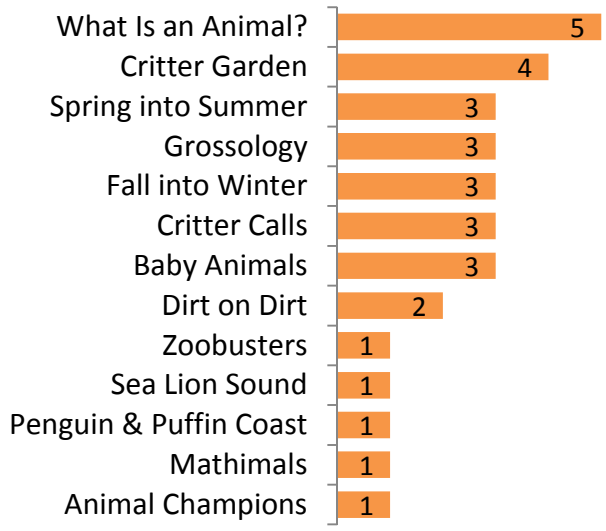
> *I [said no to] Critter Calls and Critter Garden. The wording in these just sounded very basic. I agree with the match the pictures—I mean you could do that all day long in a workbook. To see it described here, I was like that's okay, I'd pass on that one. . . . that's what you're doing all day in our school is you're matching the cat to the cat that you're reading about and you're hoping to make that picture—so to me this looked too much like school almost. . . . I want to look for something different when I come to the zoo. (Group 1 respondent)*

Group 2: Autism, Low Functioning

Group 2 respondents worked with students across a very large age range. Some worked with several students with autism in their classrooms, and others worked with these students while also meeting the needs of students with other disabilities.

Selection Criteria

Group 2 respondents made some of their program selections based on criteria similar to those used by Group 1 respondents (e.g., fits the curriculum and allows opportunity for physical activity). Yet they articulated additional reasons for selecting programs, some of which responded specifically to the needs of their students with autism who were functioning at a low level.



Reasons given for selecting programs:

- Fits the curriculum
- Activities for follow-up
- Concrete examples of concepts
- Appropriate interactivity
- Connections to life and life skills
- Appropriate physical activity

Figure 6. Group 2 programs selected and reasons given (criteria)

Figure 6 shows the programs selected and reasons among Group 2 respondents. Like Group 1, Group 2 respondents frequently cited *fits the curriculum* as a reason for selecting a program. The curriculum's connections to the Missouri Assessment Program-Alternate (MAP-A) were also mentioned (Missouri Department of Elementary and Secondary Education, 2013).

> *Critter Gardens is something that fits into the curriculum I do in the spring. We also, for the MAP-A Science portion, there's some things that could meet those expectations well. (Group 2 respondent)*

> *I also chose What Is an Animal? as one of my top ones. It's just basically everything they said. It's very accessible, it relates to science standards, it's something that the kids could possibly get a handle on and be able to apply. (Group 2 respondent)*

Another respondent added:

> *But I also think that listing the What Is an Animal? for K to three is limiting that program because, with MAP-A, even for high school that is still one of the things that's assessed for MAP-A. (Group 2 respondent)*

Activities for follow-up suggested by the program content was another reason Group 2 participants often cited.

> *The What Is an Animal? would be one of my first ones because it's very concrete and I can bring in—my students have iPads for communication and for classroom work. So it's really easy to go out and walk around the school and take photos of living and non-living things and tying into the curriculum.*

> *Then I chose Critter Garden. . . . I just felt like that was something that they could access—that we could follow it up with. The bird feeders out in the school yard and seeing squirrels out on the playground, or whatever. Just kind of build some of those connections for kids—it seemed like it was something within their realm of understanding. (Group 2 respondent)*

Group 2 respondents also selected programs featuring *concrete examples of concepts* they were teaching.

> *What Is an Animal? was the first one just because it goes into what is alive and what isn't and we've been talking about that for two years now. So maybe if they saw the video clip, or whatever, or the interactive thing it might solidify what we've been learning and give them a concrete example. (Group 2 respondent)*

> *Baby Animals is another concrete [idea]—it's either an adult animal or a baby animal. With my students I work with, I can tie this in. We do the life cycle of the butterfly, we've hatched chicken eggs, I've had canaries in my classroom to see that whole cycle of the canary building the nest, laying eggs, hatching out, raising chicks. So Baby Animals . . . another very concrete, very visible, very easy concept for the children to grasp and understand. (Group 2 respondent)*

Several Group 2 respondents said that they selected programs because they identified ways that content could be made interactive without requiring their students with autism who are functioning at a low level to talk back and forth with a presenter.

> *For sure the What Is an Animal? and then either the Baby Animals or the Critter Garden. . . . The reason I was looking at those is the idea of having my students focus on a board [Smart Board] . . . it would be interactive, but not looking at the people—it's difficult [for students to look at people]. So since it is [a new situation], I would want it very simple, something that they would possibly already know to get used to that situation before you were to move on. Because some of the stuff could be kind of cool, but I think it would be way overwhelming. So get them used to something that they do know, they can answer and get them comfortable with that setup. (Group 2 respondent)*

Another respondent explained:

> *Is it simply a matter of the presenters talking to the children and the children being able to respond back? Because if so that—I'm thinking of my class last year, that would not have been adequate for them to engage them. But if it were interactive in a way that perhaps there's like—I'm thinking interactive Whiteboard type activities. That could be like—so and so, come up and match the, you know, fish to its habitat, or whatever. That's just an example, but then they could actually come up to the Smart Board or the whiteboard and do that. (Group 2 respondent)*

Respondents also selected programs that had specific connections to life and life skills.

> *So I also like that Fall into Winter because we do focus quite a bit on seasons and how things feel different and how things look different and how animals act differently when it's warm out or when it's cold out. What we wear that's different. So it's like a whole year long unit that just carries out almost on a daily basis. So those would be very appropriate and relevant to the students I have right now. (Group 2 respondent)*

> *The other things I chose was the Critter Garden. Mostly because it's learning about their community and it's their backyard and it's just a good life skill to know about what's going on in their neighborhood. (Group 2 respondent)*

Like Group 1 respondents, some respondents in Group 2 also identified the need to include appropriate physical activity and that this could be incorporated into some programs.

> *Animal Champions, I said yes to that one because, you know, can you run as a cheetah—well, all my kids like to run and they like to leap. So I was thinking a lot of movement could be added into that one, as long as it didn't get out control. (Group 2 respondent)*

Rejection Criteria

Reasons for rejecting programs:

- Issues for students with autism functioning at a low level
- Concepts too abstract or complicated

Figure 7. Group 2 programs rejected and reasons given (criteria)

Figure 7 shows the programs rejected and reasons given among Group 2 respondents. Group 2 respondents rejected some programs because they identified issues that would be particularly difficult for students with autism who are functioning at a low level.

> *I would not choose Grossology, I will admit, it does not appeal to me at all. So some of my kiddos had those sorts of issues on a daily basis, so I mean around like functions [like vomiting]. . . . I don't think it would engage them because they wouldn't have the same [humorous reactions as other students]. (Group 2 respondents)*

Another respondent added that her students might respond to topics in this program inappropriately.

> *Yeah, and whatever is vomiting, maybe I should too. (Group 2 respondent)*

Zoo Clues sparked a similar comment from another respondent.

> *I said [no to] Zoo Clues when I just saw clues I was thinking inferences and oh my gosh, that is just a hard topic for typical kids, much less kids with autism. Kids with autism melt down every*

time they try to even think of that and then with my kids with echolalia, they'd just sit there and repeat the question over and over and over again. Then they'd perseverate on it and then you'd see meltdowns. (Group 2 respondent)

For another respondent who taught middle school children, her issue was with the activity in a program.

Students I work with do not color. . . . It may happen later on with another child or student that I come up with, which is they find that comfortable and they enjoy it. But a coloring activity, something like the Critter Garden, that's not an enjoyable activity for the students I currently work with. . . . The reason is that I have two that are unable to write. The coloring [involves a fine motor skill they don't have].

This group was very clear that programs for their students with autism need to be very concrete and have concrete examples. Three programs in particular were cited by respondents as having *concepts that were too abstract and complicated*.

I [did not choose] Animal Behavior and Animal Training for many of the same reasons. A lot of abstract concepts, and I mean they have trouble understanding their own behavior, much less an animal's behavior. So I would—I mean I don't think they would understand the concept of behavior, much less training. So just a little too over their head and too abstract and not relevant. (Group 2 respondent)

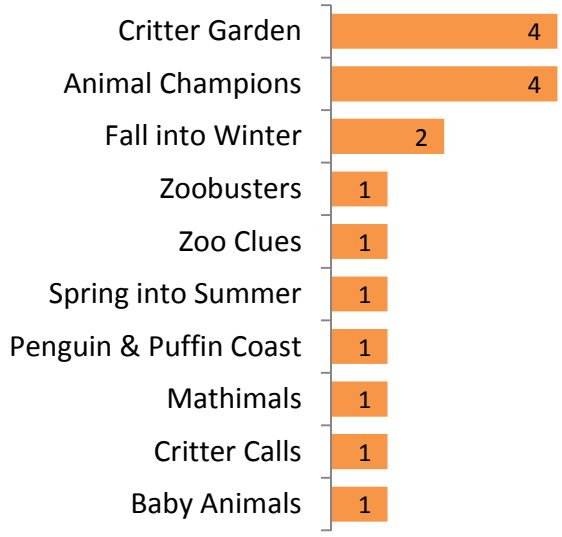
The other one I said [no to] was Zoo Busters. It's another—sounds like a great program, but I just think that it's way too over my current students' head at the moment. I mean I don't even think they know . . . most of those misconceptions, so for them to go and tell them why they're not that way would just be [confusing]. (Group 2 respondent)

With Zoo Busters, I think the whole concept is just too complicated. You'd have to define, I mean even in the first thing, can you get warts from a toad? You'd have to define warts. You'd have to probably show them a picture of one and then you'd have to show them a picture of a toad and explain that these are warts on toads and then you'd have to go through the whole thing of this is a wart on a person and this is a wart on a toad—it's way too much. So it's just better just to keep it simple and less complicated for kids with autism. (Group 2 respondent)

Group 3: Physical and mental disabilities (Grades K to 5)

Group 4 respondents work with children in the younger grade levels with a wide range of disabilities. Their responses appeared to focus less frequently on explicit references to curriculum and content. This tendency appears to be due to a concentration on the development of some basic life and social skills for some of these younger children, as opposed to exposure to more academic content at the upper grade levels.

Selection Criteria



Reasons for selecting programs:

- Appropriate for physical activity
- Interactive
- Connections to life and life skills

Figure 8. Group 3 programs selected and reasons given (criteria)

Figure 8 shows programs selected and reasons given among Group 3 respondents. Group 3 respondents reported selecting programs that *allow physical activity*, are interactive, provide *connections to life and life skills,* and are less focused on selecting programs to fit specific curriculum standards.

Group 3 participants, who taught younger K-5 students with physical and mental disabilities, focused in quickly on programs that would allow for physical activity.

> *But I did like the Animal Champions, how it had the physical activities, that jumped out at me immediately and thinking about my students who can't necessarily always sit for 30 minutes and being able to stand up and do some things and then sit back down and same with the Fall Into*

Winter where it has some interactive presentations that wording, it's like, oh, maybe they're not just going to be sitting the whole time. (Group 3 respondent)

The other one was Animal Champions immediately like it seems like it would be fun and active again not having to sit still the entire time because I have kids that just absolutely cannot do that. On their best day they can't do that. It provides a physical activity, keeps kids active, and gives them something to participate in. Like they're physically doing something while watching this. (Group 3 respondent)

Group 3 respondents also selected programs that involved interactive activities giving students things to do at their seats during the program.

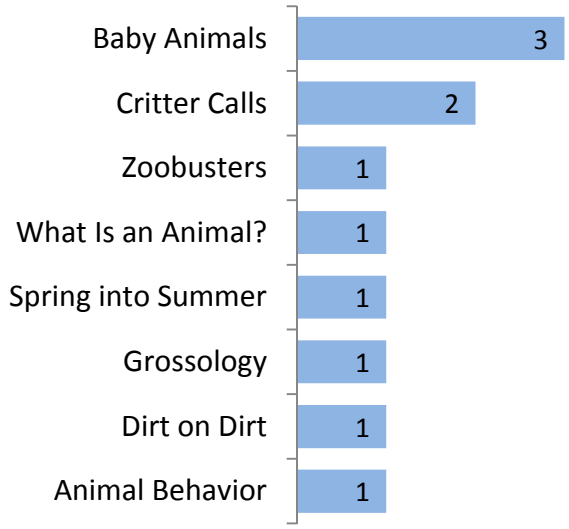
My first immediate yes was Critter Garden. It seems with the activities that are planned it's more hands on and I have children that definitely need to be kept keeping moving, you know, they can't sit still for terribly long periods of time, and if we do want them to sit still for something they have to have something in their hands to hold on to. (Group 3 respondent)

In addition to hands-on activities, respondents stressed *connections to life and life skills.*

I really like Critter Garden . . . I liked how they will learn about the animals they would see in their own backyard and then the animals they would be more familiar with because vocabulary is a huge piece for my students. Working on the vocabulary of the animals that are in their backyard or in their neighborhood is important. I also like that one how it was very descriptive with some of the different activities which includes, like, the coloring, playing with stickers and the matching. (Group 3 respondent)

For the Zoo Clues . . . kids learning . . . clues of keeping healthy, animals healthy. I have some kids who have health impairments as well, and I just think for them to make that connection that animals also need to keep healthy will be important for them learning that they need to keep themselves healthy. (Group 3 respondent)

Rejection Criteria



Reasons for rejecting programs:

- Issues for students with specific disabilities
- Prior life experiences required

Figure 9. Group 3 programs rejected and reasons given (criteria)

Figure 9 shows programs rejected and reasons given among Group 3 respondents. Similar to respondents in Group 2, Group 3 respondents rejected programs where they identified issues for students with specific disabilities. One respondent who worked with children with a range of disabilities explained:

> *One I didn't choose just because I know the kid was in my class and I know their history [whether] they're able to handle [things], the Grossology. For some it's an interesting topic. My kids wouldn't be able to handle it because of their history. And that wouldn't be necessarily something to change within that program but it would be more than teacher knowing his or her students and being able to pick out the content and the material that will work best for them. (Group 3 respondent)*

Another respondent followed up that her students, who had been in abusive situations, would also have issues with *Grossology.*

> *Right. And with some of my students have an extensive history of abuse and then they fixate on these areas and we're trying to wean them from that and get them away from focusing on those areas. So bringing up a topic about those things isn't going to be beneficial for them. (Group 3 respondent)*

Like respondents in Group 2, some respondents in Group 3 identified activities in programs that might be problematic with their particular students.

> *Right off the bat I had questions about Critter Calls. I feel like with my groups that I've had over the years this would be very difficult for my impulsive students to really reign in when is it appropriate to make the noises and when is it not. Just I mean it could be just difficult for them to navigate when to turn it on and when to turn it off. (Group 3 respondent)*

One respondent in this group worked only with students with visual impairments or who are blind. She rejected two programs because she did not see how the concepts could be presented tactilely.

> *For Baby Animals I guess the part at the very end of the description where it says we'll also learn about special baby names and how animals care for their babies. Our visually impaired kids are going to be tactical. And so I don't know how exactly our kids are going to feel [about these concepts]. (Group 3 respondent)*

> *The Zoo Busters the common misconceptions people make about animals and with the help of live animal guests with those understandings. Again our kids, my kids, excuse me, aren't really going to be able to see the animals. . . . It's going to have to be physical. (Group 3 respondent)*

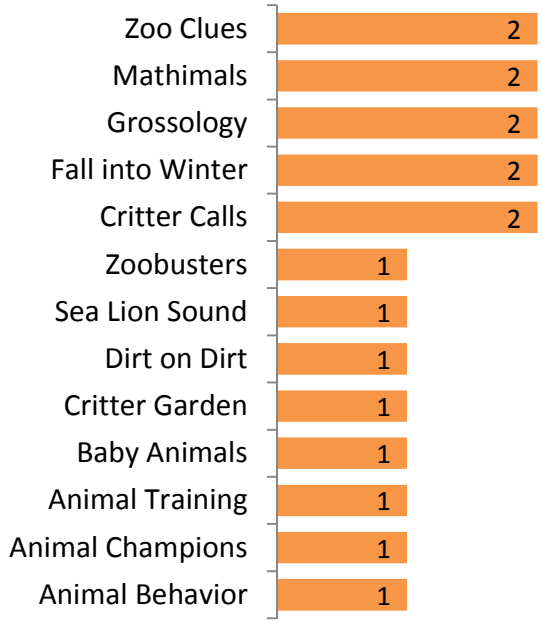
In addition, one Group 3 respondents ruled a program that required prior experience that their students did not have.

> *I had questions about Critter Garden. I deal with completely urban students who do not have backyards. Who do not really go outside to play. So would there be activities that are relevant to their lives? . . . It sounds like it's more suburban in focus and so that would be why I wouldn't pick it because I would think that it wouldn't be relevant to my population. (Group 3 respondent)*

Group 4: Autism, High Functioning

Group 4 respondents worked with students with autism across all grade levels. Several of the respondents work with students at the high school level. The focus on arranging the environment and selecting strategies for these young people to accomplish high level academic work provides a striking contrast to the perspectives expressed by Group 2 respondents who worked with students with autism functioning at low levels.

Selection Criteria



Reasons for selecting programs:

- Fits the curriculum
- Interesting and exciting
- Connection to life and life skills
- Age appropriate

Figure 10. Group 4 programs selected and reasons given (criteria)

Figure 10 shows programs selected and reasons given among Group 4 respondents. Like respondents in Groups 1 and 2, participants in Group 4 had their eye on program content that would fit grade-level curriculum for their students. It is important to remember that this group included respondents who worked with students across a very large age range—that is, some respondents were teaching students in Kindergarten and first grade while others were making their selections for students in high school.

> *[I would pick] Animal Champions, but that says only up to 5th grade so it would almost be because that fits our biology curriculum like really well because we do a lot of adaptations and everything like that. But it would have to be brought up to a high school level. And then Animal*

Behavior also because then it's the study of the animals and it fits with the curriculum. And I think it would be a great way for them to visually see what I'm trying to teach them. And for them to actually remember something that I tell them. (Group 4 respondent)

A teacher with younger students also had her curriculum in mind in her selections.

And yes to Fall into Winter. Because study that right now so I think it would be a real eye opener for them especially with it being at the Zoo they would actually see what goes on at the Zoo during the winter time. (Group 4 respondent)

Yet more than teachers in other groups, Group 4 respondents appeared to be looking for ways to motivate their students. They selected programs they thought their students would enjoy—programs that would spark an interest in learning.

I said yes to Zoo Clues program. Because our students are real interested [in solving things]—they would have big kick out of that one. (Group 4 respondent)

And I did yes to Zoo Clues because they love that—when they hear solving clues they think they're you know. . . Dick Tracy, I'm getting ready to solve all the problems of the world. (Group 4 respondent)

Grossology, they would love it. They love all that icky whatever, poop, vomit you know it's like—[laughter]. So that would really fit them. (Group 4 respondent)

On teacher was particularly articulate about why it was important finding the distance learning experiences that sparked interest with students for whom school and life may have been very difficult.

I said yes to Zoo Busters and Animal Training. Because it seems like something that they're interested in right now. . . . Our kids are so apathetic to school right now; we're trying to get them interested in it. And they just shut down and won't do anything of the curriculum if they're not interested in it. So I think they'd get a big kick out of the Zoo Busters and the Animal Training. (Group 4 respondent)

Closely connected to the idea of motivating students through topics in which they are already interested was the idea of finding things in the descriptions about how the programs to connect to life and life skills. These connections can make school activities relevant and interesting, even

challenging ones. A teacher with older students with autism identified a program with an important *connection to life and life skills*.

> *I did like the Fall into Winter. Transitioning is a really big deal. Change is a really big deal for our guys moving between activities all that kind of stuff and I think it would be a great way to incorporate some of those lessons . . . I think it would be a great way to show them changes and things happening in the environment. I think you have to make it real for them. (Group 4 respondent)*

Finally, one respondent whose son has autism explained how and why topics open to school and life connections are so important in her explanation of her selection of *Mathimals*.

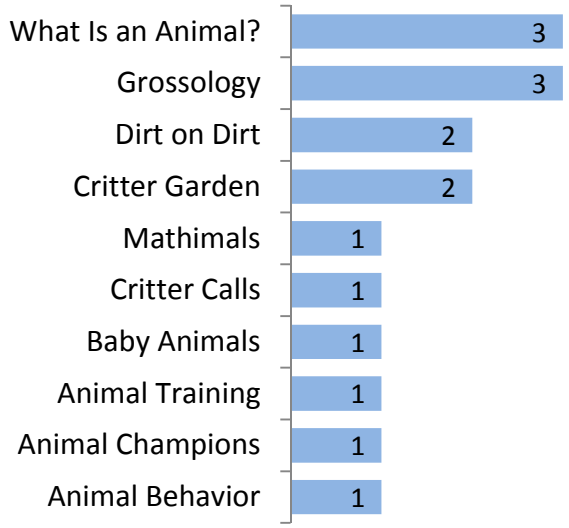
> *He's a sophomore, and he struggles horribly because there are way too many words in these math problems for him so he's trying to work out, trying to pull the problem out of all of these words. And I think if he could actually see some real life application that would make sense to him, I think it will make math more interesting for him. And I just think that it's just something he can relate to. He loves the Zoo and I think tying those two together for him would be a big motivating factor. . . . He can book learn it but he can't do it in the real world, and I think this would be a nice way to show him and draw him into math in the real world and how it works. (Group 4 respondent)*

Finally, two teachers working with students in middle school and high school reported they were looking for programs that were *age-appropriate* or could be adapted to be age-appropriate to their older students. One explained:

> *They don't like baby stuff and they like to do grade level stuff. Even if it's hard for them, they want to be with everybody else. (Group 4 respondent)*

> *Dirt on Dirt would be my third choice because we have the living dirt thing and that would be awesome with that. But again it's kind of low. . . . I mean the kids want—they are older. I have 17- to 18-year-olds that are taking two years to get through biology . . . so they don't want to be doing the same thing as a kindergartener would do, but I want them to get the same experience. (Group 4 respondent)*

Rejection Criteria



Reasons for rejecting programs:

- Issues for students with specific disabilities
- Not age appropriate

Figure 11. Group 4 programs rejected and reasons given (criteria)

Figure 11 shows programs rejected and reasons given among Group 4 respondents. Similar to other groups, Group 4 respondents ruled out programs where they spotted issues that could be difficult for their students with disabilities. One respondent, whose students had experienced abuse—some sexual—had concerns about the topic of "having babies" and rejected *Baby Animals* because of her students' issues in this area.

> *And then with Baby Animals even though this is cute and it talks about having babies and stuff, I can see that opening up a whole 'nother window of something for me. And I'm just like no. (Group 4 respondent)*

Grossology, as in other groups, presented issues for several Group 4 respondents.

> *I said no to Grossology because some of my especially high-functioning autism at this age, they still get so obsessed over things. Often it's not unusual for them to be obsessed over gross things. And if they saw this we would be talking about it for days. And they would get focused on one thing like the word "poop" and that's all we could talk about. (Group 4 respondent)*

Another responded followed up with this explanation and added that some students with autism have issues with getting dirty.

> *A lot of the kids don't like to be dirty. That's one of the questions we ask when we're screening, do they like being dirty. And so if you've got a child who can't handle the dirt whether they're physically being dirty or whether they're watching somebody else be dirty, I think that could cause you some situations in the classroom. But I think more than anything that they're going to fixate on these words and on this thing and they're going to be talking about it and you may end up losing the whole day because it is all we can talk about the whole day. Because that's the way they are. It's funny for the first five minutes, but then you've got the rest of the day to go and they're still talking about poop and that's the way it is. (Group 4 respondent)*

Another Group 4 respondent ruled out a program because of specific activities in the descriptions, but she noted that if she had input it could be a possibility.

> *And I [said no to] the Animal Champions. . . . Physical activities in my room have to be so structured and planned because otherwise you'll have somebody that really goes over the top with it. And I would be real leery of having somebody else plan physical activities for my room without having it extremely structured and knowing which of my kids can handle it. . . . if I had input to it I think it would be pretty neat, you know, like it depends if it's a cookie-cutter type class. . . . If I had input to it I would really like it. (Group 4 respondent)*

Some Group 4 respondents ruled out programs because they were not age appropriate for older children.

> *I said no to What Is an Animal? And no to the Critter Garden. I thought that my students would think that was too babyish, number one. Number two, they wouldn't be interested in learning about characteristics. (Group 4 respondent)*

> *I picked no to What Is an Animal? and Critter Garden just 'cause they're too low. I'm high school and the only thing I'd say is there not much to choose from when it says those grade levels. (Group 4 respondent)*

Comparison across Groups

This section summarizes and compares the reasons respondents selected and rejected programs across groups. Some revision of program descriptions in light of these reasons may help special education and general education teachers focus in on programs that would work well for their students and avoid those that may not be appropriate.

Selection Criteria

Figure 12 shows the number of times each of the videoconferencing programs was selected across all four groups. Please note that this count is biased toward Group 2, Autism, Low Functioning, because members of that group selected and rejected all programs rather than just the top two in each category. Given that limitation, the count may still be useful to Zoo staff members in considering which programs may be booked more often. These could be programs where initial efforts to implement adaptations and changes are tested.

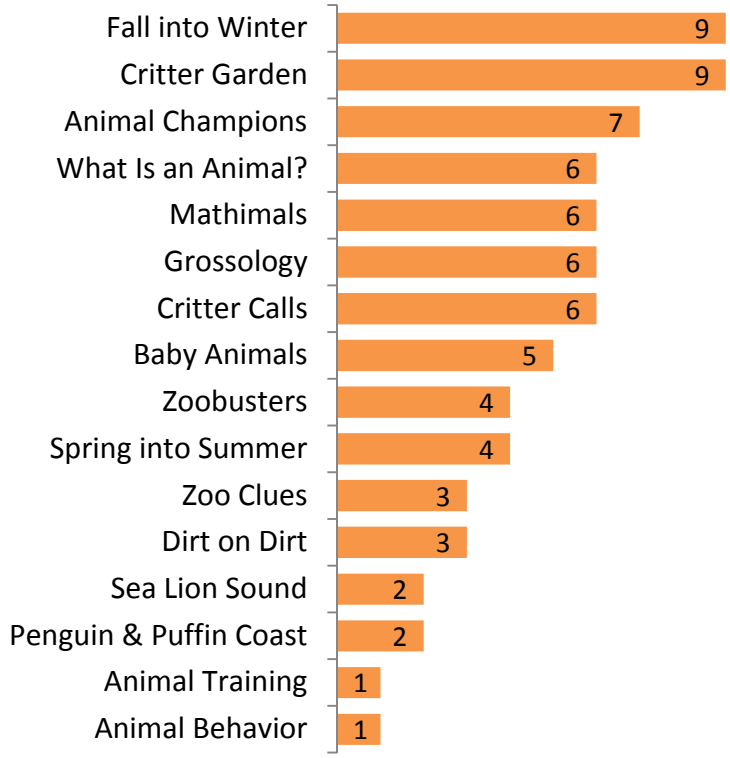


Figure 12. Frequency of programs selection

Table 6 compares whether different criteria were major points of discussion across all four groups. Yet all these criteria are important and provide insights into what respondents looked for in scheduling programs.

Table 6. Comparison of Reasons for Selecting

Reasons for Selecting	Group 1—Physical and mental disabilities (Grades 6 to 8)	Group 2—Autism, Low Functioning	Group 3—Physical and mental disabilities (Grades K to 5)	Group 4—Autism, High Functioning
Fits the curriculum	X	X		X
Appropriate physical activity	X	X	X	
Connections to life and life skills		X	X	X
Age appropriate	X			X
Exciting and interesting	X			X
Appropriate interactivity		X	X	
Cross-curricular content	X			
Exposure to live animals	X			
Activities for follow-up		X		
Concrete examples of concepts		X		

Fits the curriculum was a topic discussed substantially in three of the four groups. Respondents appeared to make their connections to their own curriculum based on the topics mentioned in the text summaries. Missouri GLEs were mentioned, but much more frequently teachers appeared to be scanning those text summaries for key words to identify content and curricular connections.

Group 1, 2, and 3 respondents scanned descriptions to identify *Appropriate physical activity*. All mentioned that sitting still for considerable lengths of time was challenging for students with a wide range of disabilities, particularly younger students. Respondents appeared to be looking for ways to make videoconferencing workable for their students.

Groups 2, 3, and 4, all with somewhat older students, looked at descriptions to identify connections to students' lives and life skills (e.g. wearing warmer clothes as the weather gets colder) as a way to make learning relevant and interesting.

Groups 1 and 4, whose respondents were working with older students, focused on the extent to which programs were or could be adapted to be age-appropriate. By age-appropriate, they

did not mean at a higher academic level but rather ways information could be presented that responded to their students' need not to be considered babyish or less capable than their age-group peers.

Similarly, Groups 1 and 4 with respondents working with older children were also the groups where respondents scanned descriptions for topics or activities that their students would find interesting and motivating. These respondents appeared to empathize with the hard work and challenges many of their students face in accomplishing school work, and want to motivate them and make learning fun and enjoyable. One can imagine that keeping students motivated and feeling good about learning can be difficult for teachers with many students who may never receive extrinsic rewards or recognition for academic achievement.

Respondents in Groups 2 and 3 discussed *Appropriate interactivity*. They read program descriptions thinking about how programs could incorporate activities that allowed their students to engage with content in ways that suited them. In Group 2, respondents considered ways their students with autism who had difficulty with eye contact and conversation could engage through activities that did not require these behaviors. In Group 3, respondents working with younger children considered what hands-on activity their students could do individually so they could also sit and listen.

Only in Group 1 were *Cross-curricular content* and *Exposure to live animals* substantial topics of discussion. These respondents with younger students appeared to be focusing on basic skills such as vocabulary.

In Group 2, with respondents working with students with autism functioning at a low level, concrete examples and activities for follow-up were discussed extensively. While these topics were mentioned in passing in other groups, helping students make concrete connections and avoiding abstractions are essential parts of these teachers' expertise. They also seemed to be looking for topics about which they had existing follow-up activities. These activities need to avoid issues for their students and be highly structured. One suspects that not having to develop new activities that they know will work is a real factor in program selection for these teachers.

Reasons for Rejecting

Figure 13 shows the number of times each of the videoconferencing programs was rejected across all four groups. Please note that this count is biased toward Group 2, Autism Low Functioning, because members of that group selected and rejected all programs rather than just the top two in each category. Yet the frequency may still be useful in identifying programs that could be less appropriate for some special education classes as well as programs where some adaptation could be made.

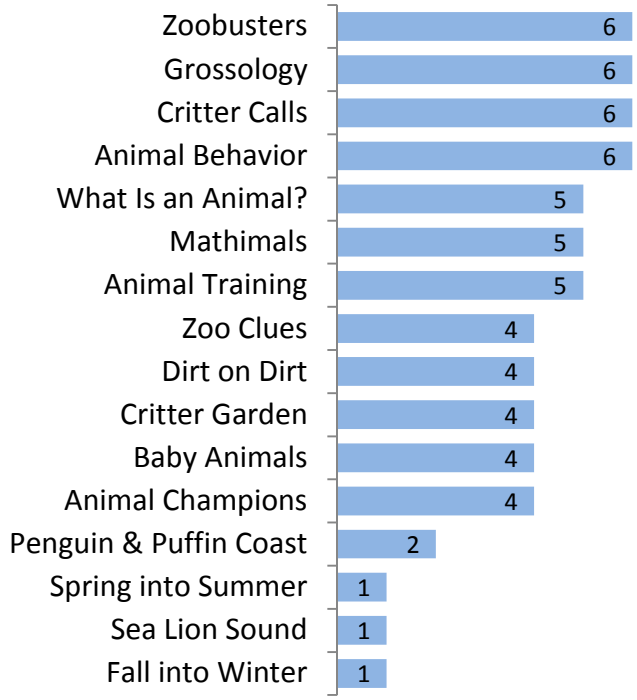


Figure 13. Frequency of program rejection

Table 7 compares whether different criteria were major points of discussion across all four groups. Yet all these criteria are important and provide insights into what respondents looked for in descriptions that led them to reject programs.

Table 7. Reasons for Rejecting Programs Compared across Groups

Reasons for Rejecting	Group 1—Physical and mental disabilities (Grades 6 to 8)	Group 2—Autism, Low Functioning	Group 3—Physical and mental disabilities (Grades K to 5)	Group 4—Autism, High Functioning
Issues for students with specific disabilities		X	X	X
No apparent connection to the curriculum	X			
Not a special experience	X			
Concepts too abstract or complicated		X		
Prior life experience required			X	
Not age appropriate				X

Rejection Criteria

Groups 2, 3, and 4 all rejected programs based on red flags they saw for students with specific disabilities. Some of the issues related to activities; for example, one respondent had students who lacked the fine motor skills to write or color. Others were cautious about activities such as making animal sounds and large motor movement if they had students with little impulse control. Some other topics also provided red flags. The content in *Grossology* was cited as problematic for some students being upset because they have problems with these functions and other students being fixated on the topic and not able to move on to other subjects. Clearly, information in descriptions about the nature of activities and subject matter allowed respondents to spot these issues.

Other reasons for rejecting programs were mentioned in only one group—yet, if these topics came up after a quick scan of program descriptions, they may well provide useful criteria for other teachers to consider. In Group 2, programs were rejected because they did not appear to provide a *special experience*—that is, something not available at school or at home. Similarly, in Group 3, an SLPS teach did not think her students had enough prior experience with outdoor activities and animals for a program to be relevant. In both these cases, information in the description was crucial in helping these teachers make good decisions about what was

appropriate for their students with specific backgrounds and experiences. Finally, in Group 4, respondents rejected programs because they were *not age-appropriate*. As they did in selecting programs, respondents with older student were very aware of finding experiences that responded to their students' need to be treated similarly to their age group peers.

Summary

All these criteria, both those used for selecting and for rejecting programs, are important. They point to the type of information respondents found useful in making decisions. In general, respondents' ability to quickly reach these decisions and provide reasons based on the brief, highly structured program descriptions speaks well for the organization and content of the descriptions. Yet some tweaks make help make these descriptions even more useful. As I will discuss in the Conclusions section, using these criteria to update descriptions may help make them even more useful for all teachers.

General and Additional Information

In addition to asking respondents to select and reject programs and provide reasons, I also asked them if the general information provided on the website was adequate and if there was any additional information they would suggest. These responses were quite similar across groups; in general, there were very few suggestions for additional information. This topic was discussed more thoroughly in Group 1, however, than in other groups.

Some teachers asked why the cost of only two programs was presented, and it took them a moment to notice costs were provided through a PDF link.

> *I was just going to say the cost. Some of these didn't have the cost. (Group 1 respondent)*

> *Well the cost is not listed, I don't know—on all of these, for some it is. For the one—the first one was $95. So it would be interesting to know what they're thinking in terms of these. (Group 1 respondent)*

Some respondents looking at the descriptions want to know about the group size and price per student. As I will discuss in a subsequent section, this information is important for funding justifications.

> *If it's price per student or price for a number of students . . . and how many you could have within that group. (Group 1 respondent)*

Another respondent wanted information about rescheduling and pricing if a student were to have a meltdown or if the technology did not work.

> *Like, I would just be interested what if you schedule and you only get halfway through, are you still spending all that money? Because [what if] something happens. (Group 2 respondent)*

Another piece of additional information requested was a name of a person to contact. It seemed that having the name of a person to contact was perceived as making it more personal and easier to call and ask questions, particularly about technology.

> *Sometimes it's nice to have a name—even though they put Outreach [Coordinator]. I know when I schedule; it's nice to have a name associated with the program. . . . I guess it would depend on how complicated the field trip zoom is, but if there's any additional information that we would need to know about that. I think it just makes it more inviting. (Group 1 respondent)*

Respondents in multiple groups said that having video clips would be helpful in both selecting and preparing for programs.

> *I was thinking there was not enough information here. . . . Clips, almost like a trailer for like a movie would be nice. . . . [Showing] what you'll experience and little snippets of each piece of the program. (Group 4 respondent)*

> *Any links to any type of video is always good. To know whether or not we would want to do this—sample clips of what might be offered. So we talked about Critter Calls—what would be a little advertising—three-second or 30-second clip of what this may look like may help me and my students decide together which one we would like to look into. (Group 2 respondent)*

Respondents said they were particularly interested in clips of activities and interactive elements of programs so they could decide whether it would work with their class or if it would need to be adapted. One teacher explained that she needed to understand movement activities in particular to determine if it were appropriate for her students.

> *When you say movement, it could mean anything from soup to nuts it just depends on what movement means to different people. In a classroom, some people are more tolerant of different types of movement than other people. (Group 4 respondent)*

Science Content Standards

This section explores the topical framework question "To what extent and in what ways are science content and connections to state and district curriculum standards important to teachers in selecting a distance education program?" As part of the videoconference program descriptions, Missouri GLEs are listed for each program, along with grade levels at which these areas are assessed.

In general, respondents indicated that standards were important to them but primarily as information to include in fundraising efforts. In selecting and rejecting programs, respondents appeared to focus on grade-level and text descriptions in the program description. From comments in the previous section about selecting programs that fit the curriculum, it appears that the respondents generally associate the standards with assessment rather than with teaching and learning strategies. In addition, especially at the earlier grade levels, respondents explained they had to focus on reading and math—and that often means there was no time for science and social studies.

Respondents explained that their students were assessed using the Missouri Assessment Program-Alternate (MAP-A):

> *It's a portfolio that the teachers actually choose alternate performance indicators for the students to actually do activities with, and we put them together in a portfolio and send it to the state. But it's certain criteria at each grade level that the kids are assessed over. The students are not actually sitting down, taking a test per se, for their assessment. We're coming up with functional activities that the students participate in. (Group 1 respondent)*

The alternate indicators are based on the GLEs listed. One respondent said it would be helpful if the Zoo would provide lists of alternate indicators related to the programs:

> *I mean it wouldn't be necessary, but helpful in plugging it. Because with the MAP-A, we determine the activity to fit that standard—the teacher determines the activity to fit the standard. So there's no real criteria as to what the activity is. So if it was suggested, yes, that would give us some new ideas of things to try in the area of science for MAP-A. (Group 2 respondent)*

Another respondent, working with younger children, explained that teaching and assessing GLEs was still challenging even with the alternate form of assessment.

The alternative assessment standards are based on the Grade-Level Expectations in Missouri standards. . . . we're taking just that essential piece, that central concept and we're trying to explain it to our kids, which is difficult because most of [the GLEs] are abstract at that level and we're still working at a concrete level, so that's tricky. (Group 1 respondent)

The most important use of standards for teachers is in fundraising.

[Standards are] important in selling it to your administrators and in getting them to pay for it. Or to a group that's going to provide you a grant. (Group 2 respondent)

We write grants to help fund our programming. So if I was going to write a grant to maybe a foundation or an organization that supports science in the classroom or educational programming people for special needs, I would absolutely include that we're using this curriculum because it's based on State standards. (Group 1 respondent)

Cost of Programming

This section addresses the question "To what extent and in what ways does the cost of programming affect the selection of programming?" Based on information from respondents in these four focus groups, cost may provide the strongest barrier preventing use of videoconferences in schools with students with disabilities. Yet this situation is neither straightforward nor simple. In general, respondents explained that teachers do not have control over the decisions about whether to use a videoconference in their classroom because their classroom budgets would not cover the cost. Teachers have to make a case to one or more avenues get the funds to offer a videoconference. Avenues or funding sources that teachers talked about using included:

- Making a case to building principals or SSD coordinators to obtain funding
- Writing grants for pools of internal monies
- Writing grants to foundations or charities
- Raising funds on public websites.

One SSD teacher recommended that the Zoo develop video clips and other information to help teachers make the case for videoconferences. He explained:

As far as money is concerned, you're talking to the wrong people. We don't have any control over how our money is spent. We can request, we can fill out a form and that's where our part of the money really, as far as it really goes. . . . So an advertisement buzz in your ear might be: this is what you're going to get for that 30-minute, 45-minute program. Going back again to [our

discussion of] video clips—it's like a lot of responsibility all on our shoulders having to sell the program for you. When I say you, I mean the Zoo. Let the Zoo, if they would, do some of that prep work for us. (Group 2 respondent)

Respondents explained that each funding avenue has specific challenges. Applying through building principals in SLPS requires justification and reporting in an era of tight funding for most schools. An SLPS teacher noted:

I would have to fill out a bunch of questions and basically tell [building administrators] how it would benefit the students and then probably go back afterwards and do a presentation to the staff. (Group 2 respondent)

Both City and County teachers pointed out that the smaller class size of special education classes puts them at a disadvantage for funding.

So the principal is in charge of those funds and there is some discretionary spending. I think it would be a little bit difficult for the average St. Louis City special ed teacher to make a proposal to do one of these programs when we have such a smaller group because our department is one of the smaller departments within our school. (Group 3 respondent)

At a St. Louis county school district, an SSD teacher described a similar situation:

I'm in a . . . situation being between the two districts, so it's kind of our administrator and what they deem is valuable for the kids or not. I think they would be open, however they would want to get as many students included as possible. So for just my classroom they probably wouldn't be as open as they would if they could include an entire grade level . . . so the more kids they could include, the more likely they'd probably be to consider it. (Group 1 respondent)

While principals want to serve as many students as possible, it may be difficult for many students with disabilities, particularly those with autism, to participate in events with large numbers of other children or in unfamiliar locations.

The social aspect is sometimes difficult—getting our kids to come to places to sit down when there's multiple children. [My students with autism need to feel I am] in my safe environment with my class, my peers, my teacher, and the active board and those things I'm familiar with. . . . I've done interactive things on there and it's a safe place to be and I'm getting this additional experience live. (Group 2 respondent)

There are other challenges. SSD teachers working in St. Louis County public schools can apply for grants through the Special Education Fund, but they need to do this in one school year to use the videoconference in the subsequent school year.

> *Let me add a little bit about the grant that we write through the Special Education Foundation—that's where our grant comes from. So that's due December, but we don't have access to those funds until the following August or next year. So that means your dollar amounts can't change on this. If I was going to do What Is an Animal? and I wrote my grant for the amount of money, that money can't change on me because I've got to wait until next year to get it. (Group 2 respondent)*

Respondents working in both City and County public and private schools reported they and their colleagues sometimes resort to fundraising websites to obtain resources their students need.

> *Teachers in my district they apply for Donor's Choice—that's an online site—Donor's Choice. It's a site where I currently have three kindled fires on there right now that I'm trying to get for my classroom because we don't have technology and a lot of my students really, really need it. So I could put something like that on there and people from the community, anywhere, can look on there and donate towards that. (Group 2 respondent)*

> *[Donor's Choice] a funding website where you write a proposal. So I've done in the past, I think I did it like three years ago for some Zoo programs. So you write a proposal then you say what you want, why you want it, and then people around the country actually can sponsor you. (Group 3 respondent)*

Respondents across all four groups believed there was reluctance for building principals to use funds for special education field trips and to allow students with disabilities out of the building.

> *I've been working with special ed [students] for 23 years, and the only field trips I think the special ed teachers actually went on were walking field trips and they were free. (Group 1 respondent)*

One respondent explained how she advocates for her students:

> *I remind [school district name] all the time that these are your taxpaying citizens in this community and they deserve the things that the other children get. So if the music department*

can go on $65,000 for field trips and performances, then other groups should be included in all of our money and funding. (Group 4 respondent)

Some respondents pointed out that this reluctance and bias could be used to propose videoconferences as good alternative to field trips.

I mean in our school district where my children go to school they haven't been on a field trip that didn't involve walking for the last two school years. . . . They're trying to cut back on costs. But I do think if you said, okay, it's going to cost $160, well, we're not paying bus fees and we don't need consent. . . . But I do think that you're going to have to justify why you're going to spend this and I do believe there's a bias. . . . I think you're going to have to be able to prove the educational value of any of these programs in order to be able to justify to the school, to the administration, to the Special School District why it is that you should have it. But I think we're going to have to fight harder for that than if you were in some of the other classrooms. (Group 4 respondent)

In summary, respondents perceived program cost a substantial barrier preventing use of videoconferences with their students. The reason is that the cost of a program is beyond the capacity of a typical teacher's classroom budget, which means that teachers don't have full control over whether to use a videoconference with their students. Respondents reported some bias against expending funds for small classes of students with disabilities and that teachers will need to expend additional time and effort to justify cost and the educational value of videoconferences to principals or coordinators, granting agencies, or donors on fundraising websites. Respondents recommended the Zoo develop video clips to help them explain and justify the experience, provide lists of benefits for special education students, and collect any evidence of effectiveness that would prove impact on students.

Attention and Engagement

This section covers the question "What recommendations do teachers have about how to capture the attention of and maintain engagement with students with various types of special needs?" Before discussing findings about specific activities, this section includes findings about the context of resources and language in the special education field as well as information about what respondents said they needed prior to programs to make certain their students were engaged in and attentive during videoconferences. Across all groups, respondents worked with a students with a wide range of disabilities and stressed that even those diagnosed with the same disability and the same level may need different approaches and materials to engage and learn. This means it is difficult to generalize about students with any specific disability

without misleading Zoo staff members about the task of adapting videoconferences for any one classroom. The need for good communication between teachers and Zoo staff members to prepare for the videoconference was stressed by respondents. In addition, they recommended that Zoo staff members may wish to offer options in terms of pre-prepared resources that teachers could match to their specific class. Yet there are some commonalities in responses, many of which apply across working with students with several types of disabilities. These respondents had a lot to say, and the following findings attempt to capture the patterns and themes that Zoo staff members can put into practice.

Context

One thing that was clear from all four groups was that most respondents work in a shared context with similar curriculum, technology, and language. Discussions included clarification of this shared context. Students also learn in the context of curriculum with familiar strategies, tactics, and organizational structures and in using familiar technologies. The discussion of this context in this report is not meant to be definitive. Rather, it defines and introduces features of this context to build a degree of shared meaning between respondents and Zoo staff members. Being able to adapt videoconference activities to this context may be a key element in keeping the attention of students with disabilities and engaging them in videoconference content.

Many respondents (those who were specifically teachers) used curriculum and activities from the sources such as Unique and News-2-You (n2y). In a discussion of how research-based learning materials are being developed and how different levels of reality in pictures are paired with words for people with a range of disabilities, one respondent suggested the following:

> *Let me share two websites that use those [paired pictures and words at different levels] some other people might use—it's called News-2-You and Unique. And if you go to those websites you'll see how those pictures are matched with text. News-2-You and Unique are two really good examples of research-based curriculum learning systems. (Respondent, Group 2)*

Unique (https://www.n2y.com/products/unique/) provides comprehensive curriculum for special education. It is structured so that students at different levels can participate in the same activity.

> *Differentiated Instruction*
> *Unique Learning System's curriculum provides a way for special education instruction to include ALL students in the same activity, with different levels of expectation.*

Level 1: Students require maximum support. Increasing participation is the main objective.
Level 2: Students may require picture support and other direct support in learning and the demonstration of comprehension.
Level 3: Students can read text, produce simple writing, perform basic math processes, and can independently demonstrate comprehension of modified learning information. (n2y, 2014B)

Figure 14 shows differentiated tasks featured in a lesson plan from the Unique curriculum. These tasks allow all students at different levels (high, medium, and low) to participate in the same reading activity but with different expectations about how they will participate and the outcomes they will accomplish.

Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will independently read literature: stories, poems, plays, fiction and nonfiction works that have been adapted to student reading level. • Students will independently read text stories that are selected at the personal reading level.	• Students will read supported and shared literature: stories, poems, plays, fiction and nonfiction works that have been adapted to student reading level. • Students will state a word or point to a picture of an omitted word during shared reading. • Students will read leveled text that is supported with picture symbols.	• Students will actively participate in supported reading of literature: stories, poems, plays, fiction and nonfiction works that have been adapted to student ability level. • Students will state a sentence from a story through an active participation response (e.g., voice output device, eye gaze choice board).

Figure 14. Sample differentiated tasks from Unique curriculum (n2y, 2014A)

Figure 15 shows an n2y activity. This resource is produced by the same company as the Unique curriculum. Both the Unique materials and n2y materials use SymbolStix figures. Figure 15 shows how these symbols and words are paired in a n2y activity. This image is interactive online, and readers may wish to see how the spoken word is connected with the symbols and how words can go to the URL provided in the Reference section of this report.

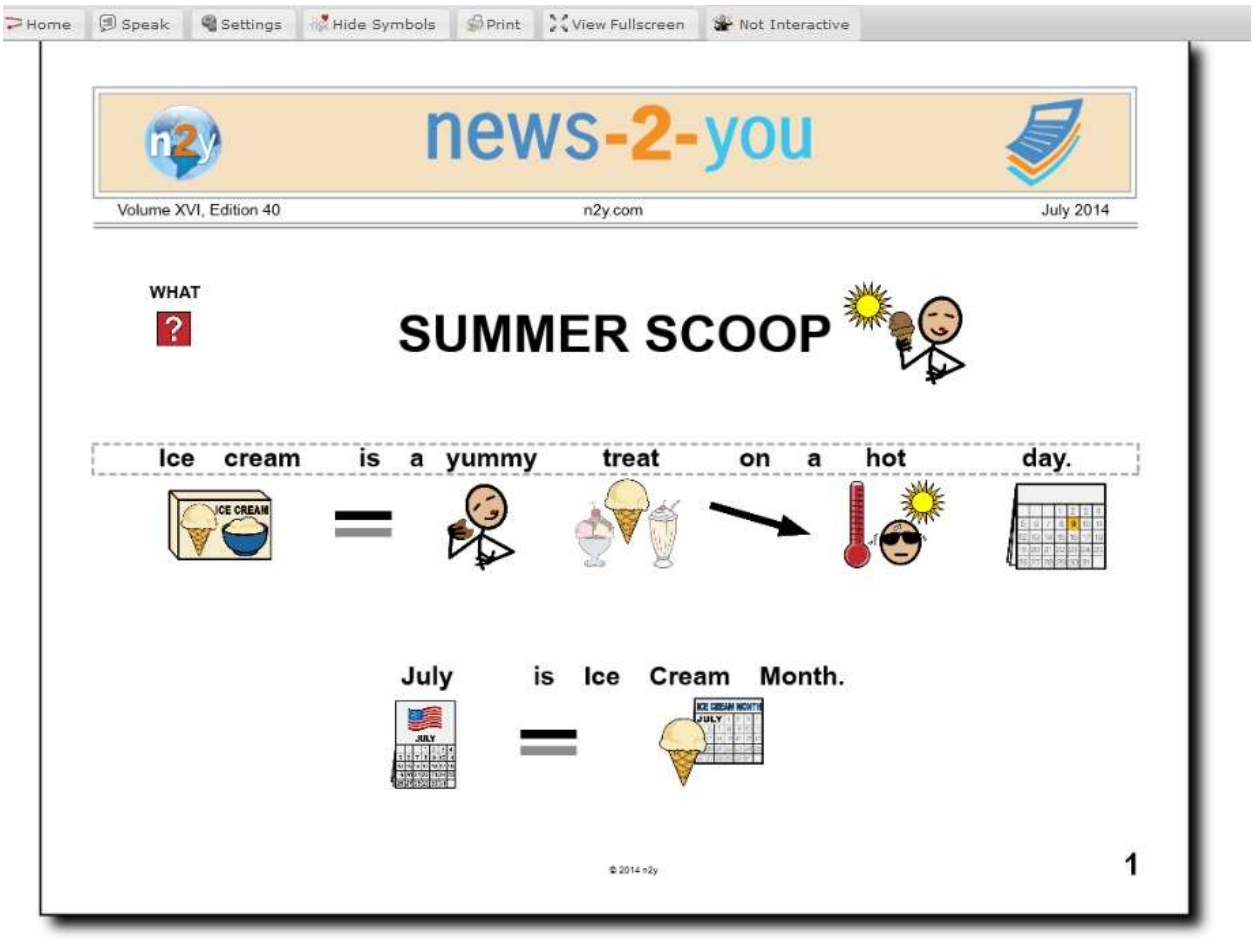


Figure 15. News-2-You (n2y) interactive activity using SymbolStix

Respondent recommendations about strategies and tactics to engage their students often referred to two technologies common in special education classrooms: Smart Boards and augmented communication. As this Group 2 respondent considered activities she would use to wrap up the program, she envisioned using both the Smart Board in her classroom and the iPads her students have at their desks. She explained that after the program, she would ask:

> *What did we talk about today? Wow, that was so fun—so I would do the same thing whether the person was still with me or was not. Probably maybe write a thank-you letter. Bring in some writing into this. And writing can look like putting some PECS [Picture Exchange Communication System] pictures/symbols within a sentence, matching that. It could be the actual, physical writing—I have one that can write. They all can type—we can all type since it's on their iPad. They can type right off the board as we're writing along. So there's always writing activities that we can pull in to afterwards. (Group 2 respondent)*

As with this respondent, it appeared that about two-thirds of the respondents had Smart Boards in their classrooms. Smart Boards—digital whiteboards with touchscreen capabilities—are connected to a computer. Figure 16 shows a teacher using a smart board in her class. These devices allow teachers and students to manipulate information by touch and to utilize pens to write on images. Teachers can also use PowerPoint and software such as Boardmaker® Studio from Mayer-Johnson to design structured screens of information. Some smart boards have the capacity to interpret multiple touch, thus allowing collaborative learning for students (Colburn, 2011, April 10; Daly, n.d.; Thinkucation, 2014). The brands most frequently mentioned by respondents were SMART Board® and Prometheus. Many classrooms would participant in videoconferences using these devices.

Figure 16. Teacher using Smart Board in classroom (Colburn, 2011, April 19)

For students with limited literacy, respondents explained they use symbol sets with simplified visuals and words such as the symbols shown in Figures 17 and 18, which are available from Mayer-Johnson. Respondents suggested some activities that involved augmented communication devices. This term covers a wide range of high-tech and low-tech devices used by students with a range of disabilities.

> *Augmentative and alternative communication (AAC) is an umbrella term that encompasses the communication methods used to supplement or replace speech or writing for those with*

impairments in the production or comprehension of spoken or written language. AAC is used by those with a wide range of speech and language impairments, including congenital impairments such as cerebral palsy, intellectual impairment and autism, and acquired conditions such as amyotrophic lateral sclerosis and Parkinson's disease. AAC can be a permanent addition to a person's communication or a temporary aid. (Augmentative and alternative communication, 2014, December 30).

Figure 17. Symbols for developing learning materials—Classic (Mayer-Johnson, 2015A)

Figure 18. Symbols for developing learning materials—Studio (Mayer-Johnson, 2015A)

One specific augmented communication system mention by several of the respondents working with students with autism is the Picture Exchange Communication System (PECS).

> *PECS stands for Picture Exchange Communication System. It is an alternative communication system developed in 1985 by Andy Bondy and Lori Frost, to help children affected by autism convey their thoughts and needs. It is now a trademarked program of Pyramid Educational Products, which is the company founded by Bondy and Frost.*
>
> *It is known that with autism, learning is easier when it is done visually. In PECS the child with autism will be able to initiate communication by handing out picture cards related to what he or she is thinking of. It could be a picture of bread, which would mean that the child is hungry or maybe a picture of a ball, which would convey play. (Special Learning Inc. 2011).*

Like other well-educated professionals, focus group respondents use language and acronyms common to their field. Attention to this specialized language will be needed to support good communication between Zoo Staff members and teachers. One of several useful online resources is a Special Education Acronyms and Glossary (Ask.com, 2015). Each entry is connected to a more detailed description and articles on each topic.

What Teachers Need before the Program

Respondents stressed that capturing and maintaining attention during and after the program, starts with preparing students with disabilities prior to the program. Pre-teaching appears very important for students with autism. Respondents asked for a teacher's guide, lesson plans, and video clips that would give them an overview of the program so they could pre-teach and prepare students for the videoconference.

> *It would be nice too if they had any suggestions for like how we'd prepare our students for it. Like maybe some stories or some little online videos or something that you can watch to prepare our students before they came. A teacher guide. (Group 1 respondent)*

> *[Lesson plans] might help you so you can do some pre-teaching lessons, you know, because that helps with the autism. [I am] always pr- teaching and getting their minds set and ready. (Group 4 respondent)*

Vocabulary was the most requested item from respondents in all groups. This included vocabulary related to animals involved in the videoconference and contents of boxes or kits sent to use during or after the program.

> *I think it would be helpful if the teacher was provided with words to pre-teach the students before the programs. So if there's words that are going to be used in the program, the students have prior knowledge—some key vocabulary. (Group 2 respondent)*

> *I think it would be great to know what would be coming in that box to go with the program. I don't know that there's a way to specify the animals. Like when we've had programs come, the outreach program come, I'm always emailing [the Outreach Coordinator] the week before saying do you know what animals so that way we can pre-teach the vocabulary? So if you knew what animals that you could put in here. But that I think changes depending upon how the animals are doing that week. But I think knowing what's going to be in that kit would be helpful. (Group 3 respondent)*

Respondents working with students with autism stressed they need to prepare students for hands-on activities and review items in boxes to see if there are any items that may upset specific students.

> *I think anything involving the hands-on would be good to preview. If you are getting—bio-boxes or whatever the term is going to be [used] and it has skulls on it or skin . . . . I would like to know what was coming in this box so that I knew this guy over here is hypersensitive—so that way I would know what I need to do with my kids. When we've had the Zoo come out to our camp, I already knew in advance which of my kids were likely to have issues with the touching because they're too heavy-handed and we made sure we catered to that. . . . I would like to have so I could make sure that I was prepared and I didn't end up sending a box full of pieces back to the Zoo. (Group 4 respondent)*

Respondents working with children using augmented communication devices needed vocabulary to program devices prior to the program.

> *I was going to say to play off that then you can also program things on their aug com [augmented communication] devices for them to be able to interact with the presenter. (Group 2 respondent)*

Finally, respondents believed it would be useful to communicate with the program presenter prior to the program.

> *I was just thinking communication between myself and the Zoo member. Because I've been in [another respondent's] room and I know that [her] room is 100% different than my room and yet we both have self-contained, elementary, autism classrooms. So communication between myself and [the Zoo staff member would be about] some things you might expect out of my kids. These are some things that might trigger some behaviors in my kids and these are some things that might . . . help you guys. Because if I say . . . my child is terrified of X, Y, Z, they might want to make sure that they're not incorporating [that item or animal]—or this little piece might need to get pulled back a little bit from the presentation so that we know we're not triggering some kind of behavior from the student. . . . I think phone or email would work. (Group 1 respondent)*

Respondent Recommendations about Capturing and Maintaining Attention

Before the Program

As I explained earlier, respondents wanted to make certain their students were well-prepared to participant in the program by engaging in activities before the videoconference begins. Teaching vocabulary was high on their list of things to do. Respondents in several groups also

pointed out that one reason for pre-program activities was to make a new experience (videoconferences) less scary for student.

> *Now I have to . . . teach the child before something is occurring because a lot of mine cannot take apprehension of the fear of the unknown. (Group 3 respondent)*

Vocabulary, objects, and pictures were cited as things that would useful in preparing students for this new experience.

> *Prediction is a big thing because if you can predict then there's not a surprise for them. So what you were saying—exposing them prior to vocabulary, to maybe even you know objects or pictures or things that are going to prepare them for what's coming. So predicting for them in different ways what it's going to be about. (Group 2 respondent)*

Several respondents suggested that video clips, available prior to a videoconference, would also be something teachers could use to prepare students for the videoconference. One envisioned this clip as an introduction to the presenter:

> *Back to like surprises and some are good and some are not good and some people don't deal well with it. The whole idea of having a videoconference for a lot of these kids is going to be something new. Totally. And something that they haven't experienced before. And so what I think might be a good thing . . . is having a video clip that could be prepared ahead of time. It doesn't have to be like the videoconference, but email a clip to the classroom to us. . . then you have the presenter who introduces themselves and says hi, I'm Kim, I work at the Zoo and we're going to have a program and it's going to be in five days and here are some things we're going to talk about. . . . [Then the teacher can follow up] Kim says we're going to talk about zebras today . . . where do you think a zebra lives? What do you think a zebra eats? Well, what color is a zebra? How tall do you think a zebra is? I mean just basic things that get them prepared. . . . And you're going to get this package that's coming to you, this box and you're going to get to go through that with me, or you're going to get to look at it ahead of time or however they want to set this up with this kid. (Group 3 respondent)*

Reading books and using hands-on materials were other pre-program experiences that respondents suggested.

> *I would probably read those books about whatever the topic is that we're talking about, have some hands-on materials, introduce new vocabulary and language that might be used during that session to help get them ready to be able to talk about whatever it is we're discussing*

during the session. But just to create that excitement by being enthusiastic myself about okay next week we're going to talk with the Zoo and this is what we're going to talk about and demonstrating that excitement with them respondent. (Group 3 respondent)

Another respondent explained that to prepare her students, she would have them research topics in the videoconference, write what they were hoping to learn, and think through questions they could ask.

I would find very beneficial . . . to be able to pre teach what they're going to learn about and to have them research it . . . and write something that they were thinking about and they were hoping to get answers . . . [and then] they could ask a question that would then fit with what was going on. (Group 4 respondent)

All these ideas suggest materials the Zoo could provide to support teaching and learning to prepare students for a comfortable and engaged videoconference experience.

During the Program

Respondents also had several suggestions about how to maintain attention and engagement during the program. These suggestions were about presenter style and techniques, pacing and structure, and length of the programs.

Presenter Style and Techniques

Respondents in Groups 1 and 3 who worked with children with physical and mental disabilities stressed the importance of the presenter being animated and enthusiastic.

And it's the presentation and the approach with everything. You could make the most ridiculous thing exciting. It's how you approach them with it. It could be the best thing on the Earth, but if you approach it like, oh, you know, we got all this is what we're going to do today, no one's going to care. It's enthusiasm by the presenter. (Group 3 respondent)

The presenter needs to be . . . animated and engaging—just personalitywise, just a little more animation in it and not just standing in front of the screen with this monotone. (Group 1 respondent)

Group 2 respondents who worked with students with autism functioning at a low level gave the most explicit advice about presentation style.

I think they need to probably spend a little bit of time in one of our classrooms to experience exactly what our students are like, how to talk with them, how not to talk with them. What to expect—some things that might startle them, you know? As people that are outside our field they need to be prepared for a lot of different things to happen. (Group 2 respondent)

This was echoed by respondents in Group 3 who wanted presenters to expect and be prepared for meltdowns and some profanity, but to continue the presentation and let the teacher handle it.

My kids have a hard time of transferring from one activity to the next and there could be major meltdowns. And that could include screaming and inappropriate words that I don't want the instructor to be surprised. (Group 3 respondent)

I was thinking about the meltdown piece. And prepping [Zoo staff members] to know you're going to hear profanity and it's not directed towards you, please don't take it personally. Just continue about your program. (Group 3 respondent)

I mean you're not going to get the profanity in [that] mine are little people. But you could experience and probably will experience meltdowns. And that, you know, the teacher staff that are in the room will handle that. You just go about your business and carry on because the other kids are waiting and they're going to want to participate. So we'll take care of that part and not to be surprised by it. Just keep it moving. (Group 3 respondent)

Other respondents stressed basic, simple language.

One of the things that I've noticed or observed with people who might come into my room and don't know the students is they need to make sure that their language is very basic and simple. As few words as possible and very concrete . . . . I mean the fewer words in a sentence the better because people tend to try to explain and then you've got blah, blah, blah, blah, blah, blah. They don't hear a thing. So short and sweet and concrete. (Group 2 respondent)

When we talk about keeping our communication simple, to the point, but we don't mean monotone. . . . You know, a regular tone, volume, and cadence is wonderful. I agree with the short—keep it to the point. (Group 2 respondent)

Respondents also advised presenters to give students processing time.

> *Another strategy you might add to your list is processing time. So when you interact with our kiddos and you ask a question, ask one question, then you have to stop and wait. Don't ask another question or change a question. And let us, on our end, do a little bit of prompting so they can respond. (Group 2 respondent)*

Group 2 respondents gave several tips for questioning strategies that work well with students with autism.

> *Another strategy is multiple choice questions with two answers. One being real obvious and one not being very obvious, or some good yes and no questions. (Group 2 respondent)*

One respondent clarified:

> *True/false is really confusing for our kids—so stay away from that. (Group 2 respondent)*

Another respondent, displaying scratches on her arms, explained:

> *I have a student that doesn't do well with direct questioning. So like if you directly question I'll get scratched. So his anxiety goes up and then he scratches. . . . So when that happens I have to remind myself to, instead of directly questioning him I'll say the question as a closed statement. . . . Instead of what color is it, that shirt is—and then leave it open-ended and then he fills in the blank. So it's more or less a fill-in-the-blank questioning. But it takes the pressure off of them to come up with an answer because they can just fill in the blank. (Group 2 respondent)*

Group 2 respondents also gave advice what to avoid in classrooms with students with autism who function at lower levels.

> *They should be prepared for if they haven't worked with a child of special needs. . . . . I think a lot of people get scared when there might be screaming . . . . Like keep going—that's normal. So I think that exposure to something like that, because I think in a typical situation they might stop and think they need to wait. (Group 2 respondent)*

> *My kids will get really excited and start hand flapping and some will jump. Then [the presenter] might think, 'Oh my gosh, what's going on?' and it's like totally and completely normal, I can just ignore it. Then it goes away in a second. But somebody who's [presenting] would see that and be*

like what the heck is going on? Then it might cause another problem if they don't just continue and ignore it. (Group 2 respondent)

Group 2 respondents cautioned presenters to prepare students for any revelations or surprises during the program.

My kids can't be totally surprised or they won't be able to talk about it. Or they won't be able to generate a question to ask the presenter. (Group 2 respondent)

Another respondent clarified:

I think [preparation] takes the anxiety and anxiousness [away]. I have kids that have anxiety disorders as well. And you're right, there are some kids that a surprise may not be the best, but this can still be a surprise but it can also still be they're prepared for what's coming. (Group 2 respondent)

Finally, respondents in multiple groups advised presenters to recap and review throughout the program so that students could continue to make connections between and among ideas.

Reviewing, not waiting just to the end, but through the whole program. (Group 1 respondent)

Reviewing at the end of programs, however, is especially important, and teachers with students using augmented communication may need to work with the presenter to plan ahead so their students can respond.

Like every lesson plan—you do a recap. What did we talk about today? Can you tell me what's one thing you learned about the tiger? What's one thing—or we talked about three animals today, what are they? They have these little cards they hold up. It's all about that prep, it's all about that getting ready so when we do that post-learning it's all right there, we're ready to talk about it. We've got three pictures of a cat, a lion and a car. Did we talk about a car today? No. Did we talk about a lion? And a lion is in the cat family—I'm making stuff up. So having that just right there, ready to—and easy stuff they can point to, say the word or match a picture. (Group 2 respondent)

Pacing and Structure

Group 1 respondents suggested that each program have an agenda.

> *I would definitely have an agenda where the kids know where they're heading. If it's a path on the screen that says here we're going to start here, take a walk down here—whatever it is to connect what the learning journey will be for that day. (Group 1 respondent)*

> *Right, well even to go back with your agenda, you know mapping of where they are—that could be a handout that they could be mapping at their desk. Okay we did that, they could check it off or circle it or whatever with visual pictures. I mean for my students they're all going to need visuals—pictures paired with words. So that could be something that they could be checking off as the program—so again, they see that start and they see that finished. (Group 1 respondent)*

Respondents in Groups 1 and 3 said their students would need to have a break halfway through programs.

> *If it is a 45-minute program, there needs to be that halfway through break. I know we play games like six spot and just brain breaks they're called, just taking a minute out to just do something fun. It might be something fun during the vide conference if the person on the other end knew a little something about our group and you could say, we're going to play [a game] with you guys. (Group 1 respondents)*

Another Group 1 respondent discussed using movement as a break from desk work and listening.

> *It's going to be really hard, I know, for any of our kids to sit for 45 minutes if they're not up and being able to like get up at least a couple of times or engage –singing, dancing, any type of movement activities. They're not going to sit for 45 minutes. (Group 1 respondent)*

The topic of using movement during breaks and as part of programs was discussed extensively in Group 3. These respondents explained:

> I call it getting our wiggles out. You gotta get the wiggles out in order to sit down and do the work. You have to have these breaks and they have to be built into the day. (Group 3 respondent)

Respondents recommended using timers to start and stop movement.

I used timers so I have a Promethium Board and so on it I use a timer application. And we have like a 30-second, 45-second, minute brain breaks, whatever they are. And then they have a visual representation so I would definitely recommend if you're doing, then have some sort of timer component on that video screen that they can see and it counts down. (Group 3 respondent)

Others noted that they have used taped squares around students' desks to help make movement-based activities better organized.

We use taped squares around our desk areas for my friends who like to get a little wiggly and venture outside their area. So they know that this is their box, they stay in their box when they do their wiggle dance or what have you, and then it starts with a song and then it ends with a song, and then we move on to whatever we're going to do next. (Group 3 respondent)

Respondents cautioned that students need very specific and very simple instructions.

So like on this Animal Champions, if you want them to run like a cheetah make sure that it's run in place like a cheetah. Or you know, because otherwise you'll have students who run down the hall, you know? So very specific instructions. (Group 3 respondent)

A visual model is very helpful. So whoever's doing it could stand there and do it and model the behavior even before. Like in five seconds the music's going to play and we're going to run in place. And I'm going to do it first and then you're going to do it. So watch me, here I go. And then the music stops and she says, okay, it's your turn now. Then it's their turn to do it and then they play the music. It has to be guided and it has to have a beginning and it has to have an end. Because if you don't then they are lost. They just can't focus that long or they can't—and the instructions have to be specific enough that they don't have too many steps—a lot of our kids have sequencing and processing issues. So the process isn't, stand up, turn around, touch your head, sit down. It's going to look crazy because they can't get past the first thing it comes in, stand up. (Group 3 respondent)

A respondent pointed out that that presenters would need to be flexible and be repetitive with directions.

Give the direction in not just one way but a variety of ways. So have your typical standard direction but look at how can you adjust it if it appears that the children are not understanding. . . . And I don't think you can ever repeat it enough. (Group 3 respondent)

Using movement for breaks or as part of instructional activities will require presenters to be adaptable. One respondent explained:

> *And I think that's the mark of what's going to make this successful and not successful is their ability to adapt on their feet while they're doing this and seeing what's happening on the other side. They just have to be tuned in and every classroom is going to be different. So what works with this group today is not going to work with her group tomorrow and that's just the nature of what we do. You know, no two students or two classrooms are going to be the same. (Group 3 respondent)*

Length of Programs

Group 3 respondents suggested that programs could take a little longer than the time listed in the descriptions.

> *I think that's where a 30 minute time may be problematic for [our] children. . . . Children who are typically developing and the Zoo instructor can give a direction, they can do it, it's a much faster pacing versus . . . constantly having to reiterate those directions or provide that visual with it whereas you wouldn't typically in a general education setting. So a little bit extra time might be beneficial. (Group 3 respondent)*

> *Thirty minutes or 45 minutes seems like a long time, I think, to the person who's providing the service standing up there and getting them to do things. But on our end, to get them through beginning to end and get them to understand what the program is about might take them a little longer. (Group 3 respondent)*

Activities

Respondents in Groups 1 and 2 suggested using music and sounds to get students' attention and keep them engaged. Some respondents recommended using songs to signal beginnings and ending of programs.

> *I was fortunate two years ago to have the Zoo outreach program come to my school, to my classroom and another teacher's classroom as a pilot program. Some of the things that we were just talking to them about doing, which was wonderful, is that we started every activity with a song and ended with that song. So that would be something—I mean it was simple, it was where animals live and what animals eat and it was just this little song that we sang at the beginning and the end. So something, again, that would kind of be part of the agenda that this is the*

opening, this is the closing, that the students would know and it would also be something that would be engaging for them. (Group 1 respondent)

I have one other thing—music. That's very engaging, just to make my kids want to come over to the Whiteboard and watch the presentation. Music is hugely engaging for my kiddos. (Group 2 respondent)

Sounds can be also engaging. If it's the bird chirping or the water flowing or the cow mooing—so sounds could be [useful]. (Group 2 respondent)

One respondent gave advice about the types of sounds that negatively affect their students with autism and those that do not.

The zoo sounds, recorded or live, I don't think will have any scary effect on our students. When we talk about sounds [that frighten] our children with autism, we're talking about the fire drill buzzer, we're talking about a siren going by, we're talking about the gymnasium with 35 kids dribbling a basketball. . . . So [those are] the sounds that are more difficult and challenging for our kids that we work with. So when we're watching this and we've prepped our kids that we're going to watch this today about some animal sounds, animal critters, I've already found some YouTube links of what an owl sounds like or what a lion's roar sounds like. And I can control the volume on my computer and if I need to turn it down, or turn it up—we go back and forth. So I just wanted to give you a little bit [of advice] about sound. (Group 2 respondent)

Finally, several respondents said their students would need to have materials at their desk to help focus their attention during the videoconference.

There may need to be some supplemental material that they can have at their desk and interacting with the person on the screen. Something that they could be doing and sharing back and forth—again, that would bring in that doing piece. (Group 1 respondent)

I know my students—if they had a handout during the activity, even if it was an agenda or—you know for older students, we're all about note taking. If they had an outline that would be filled in as they were working. I mean I would even say for—even picture outlines, sometimes my kids like to draw in order to listen—they kind of doodle on their page. So . . . they'd be looking up [to the screen], they'd be listening a little, engaging with the content. (Group 1 respondent)

After the Program

Respondents across all four groups had suggestions for appropriate follow-up activities that would engage students and extend learning. Many of these activities featured hands-on experiences.

> *We were just talking about the Grossology, like a recipe to make slime. You know, there's a way of making slime that the kids could actually do a hands-on experiment to make some of those activities. (Group 1 respondent)*

Respondents in all groups were excited about the boxes they would receive with the program.

> *So as age appropriate as possible, that they can have that real, firsthand experience with touching things or maybe fossils or . . . things that they can actually touch to try to make it more real for them. (Group 1 respondent)*

Some respondents want to connect to someone at the Zoo for follow-up questions.

> *Somebody they can probably connect with and keep in contact with. . . . . Maybe it could be one of the docents. . . . Just to keep that connection going [with the]the videoconference. (Group 4 respondent)*

> *I just thought of something that might work with older ones but would they like to have somebody they could—if they came up with questions afterwards that they could send an email or something to somebody to ask a question that maybe they would get answered. (Group 4 respondent)*

Respondents in more than one group indicated they would want to use an activity after the program to assess what students learned.

> *I don't want to say post-test but it would be a post-test to see if they know what was presented. It could be hands on. But some type of activity. (Group 3 respondent)*

> *Well, what they pushed right now are exit slips. And so they could write a letter thanking the people for the [videoconference] and if they had any further questions they could ask it then or tell three things that they learned from the [videoconference]. Because we're required in our district to do exit slips. (Group 4 respondent)*

Follow-up projects of several types were suggested. Some were projects that extended and recapped learning points. Other activities involved more extended projects.

> *And something when the outreach program came to my classroom, because they came once a month for a year. We made a book every time they came. So they gave us pictures with a little saying, and the kids were able to make a book that they could take home to share with their families after the activities were over. So that was nice. (Group 1 respondent)*

One respondent provided an example from a unit she is currently teaching.

> *We're actually at the end of our unit and we've worked with plants and pollination and how animals help seeds travel. Yesterday we just talked about what type of animal they're going to construct and what materials they're going to need to build this model of an animal. They're creating this animal and they're hands-on with this. But then they're going to be able to describe to me and the rest of the class. . . . So they're tying in all that content that we learned and they're still hands-on creating something. So. And they love it. They're so engaged into it. It would be cool like [after the videoconference] if their project was to even create their own animal. Even if it's drawing it and then talking about what the adaptations that animal has to then survive. Something that they can either make, draw, write about that kind of brings all of those topics together for them. (Group 3 respondent)*

Writing and journaling were suggested by several respondents.

> *So like I will have kids who are non-writers who couldn't write about their animals but they could maybe draw about the animal. Or maybe they can't draw or write but they could construct something. You know, so I think if [Zoo staff members] just could give a list of suggestions. (Group 3 respondent)*

> *Journaling regardless of age or ability, we do that even with three-year-olds. Where we'll sit down and we'll say, okay, tell me what . . . was your favorite thing you did today? What did you learn today? And then what we do is the sheet of paper we ask for three things. So it's divided into thirds. And at the top, I'm the teacher, I'm going to write you know, Amy loved X, Y, and Z. And then Amy's going to draw her picture saying this is what that was. You're going to ask the child what did you learn today, you know, what was your favorite part of this vide conference. And then we'll write that down and then we ask them to draw what that looked like, how did that feel, how did that—I mean any description that they give to us we write and then we have them draw because they can't write it. (Group 3 respondent)*

I just thought of something that might work with older ones but would they like to have somebody they could—if they came up with questions afterwards that they could send an email or something to somebody to ask a question that maybe they would get answered. (Group 4 respondent)

Finally, some students have iPads, and video projects could be considered as a way to reflect on learning.

We use iPads a lot where the kids videotape each other so they could do like a video demonstration of what they've learned. (Group 3 respondent)

Respondents provided a broad range of suggestions for follow-up activities they could do with their students after the videoconference. These activities would allow students to demonstrate and reflect on what they had learned, tie together ideas, and in some cases provide experience in communicating their ideas. Formats for follow-up activities and projects include hands-on learning with objects and presenting information in writing and pictures, and on video.

Recommendations about Materials for Boxes

As I noted in a previous section, respondents said that they wanted to know what items were coming in the box.

I think it would be great to know what would be coming in that box. But I think knowing what's going to be in that kit would be helpful. (Group 3 respondent)

Another respondent explained:

We can do something before so they know what's coming and then we can follow it up afterwards. So if we know what's coming we can, you know, if it's going an egg or a fossil type thing, we can develop what we need to and get them to where we think they are ready to digest this information in this format before it gets started. And they have some kind of context. . . . Where if you're just going in cold and afterwards we have this box and you pass it around they're not going to, at least my kids are not going to connect this, what they're holding, to what's happening on that screen. It needs to mean something. (Group 3 respondent)

Respondents made suggestions about the types of things that would be good for the boxes.

Hands-on, colorful, interactive things—maybe even picture word cards to reinforce the vocabulary that we've talked about. Different textures—yeah, the sensory piece. (Group 2 respondent)

Something that you can compare, you know like if you were talking about paw size or something so that it showed the differences because they don't get that things are different sizes. (Group 4 respondent)

Maybe like some of the jelly bean buttons where you just press them and it makes an animal noise that can go along with an object. . . . (Group 2 respondent)

Respondents also shared characteristics of items to include and not to include in boxes.

Things that aren't easily broken, or that aren't irreplaceable if they do break. (Group 2 respondent)

Whatever is in there, if it's destroyed it's not the end of the world and that it's replaceable easily without a big funding issue on the Zoo's part or our part. If you send feathers in a bucket, they're going to stroke them in the correct way, but you're going to get some stroke a feather the wrong way and it's going to break all the little things really easily. (Group 2 respondent)

Very small items were not recommended for the boxes.

Anything small. Anything that could fit into their mouths. . . . But anything that they could put into their mouths and choke on or swallow or because we do have kids that are oral fixated and everything they pick up goes right to their mouth. (Group 3 respondent)

I would say not things that are small though . . . things that are too tiny little bits because they'll be under the chairs, under the tables and again you want easy to handle, hardy, solid. (Group 4 respondent)

Respondents had different perspectives about authentic items.

Furs. I know they would like furs. (Group 4 respondent)

One of the teachers she does [Zoo outreach programs], she was saying that actual fur is a problem because there's allergies, it's actually a real fur. I suggested possibly with technology the way it is now, that if they had fake furs that felt the same way and looked the same way, but it was fake so it could be brought back and washed if somebody put it in their mouth—the

germs. But something that they could feel—investing in something that looks just like it, but it's not and can be washed. (Group 2 respondent)

We don't want . . . .any real animal bones—I don't know if that's something you do. I know there's the plaster one and they make molds if they're plaster or plastic. That would probably be more ideal, it would give us an idea of what it looks like, even though it may not be real. (Group 2 respondent)

Yet one respondent who taught students with autism recalled an experience with authentic items that was very engaging for her students.

I'll be honest. We did a thing at one of the camps where the kids had owl pellets and there were rodent bones and stuff in there and the kids with disabilities loved it. I mean they had gloves on but they still, they really got into it. They were shocked that there were even bones in there. And it was poop so I don't know. Not all kids with disabilities would be so grossed out by that. (Group 4 respondent)

There were also a range of ideas about whether multiple sets were of items in boxes were needed. One respondent requested multiple sets of items:

If possible, more than like one set. Like multiples. So they don't have to wait. . . . because waiting is hard. (Group 2 respondent)

Yet when asked about this need, a respondent in another group disagreed.

I think one of the things that we strive for is working toward waiting your turn. You know, being polite, please and thank you. It's not your turn, sorry you're going to have to wait a minute. You want them to have those social graces that come with this. If there's only one, then there's only one. And they'll wait their turn. (Group 4 respondent)

In summary, there was agreement that items should be replaceable, sturdy, and too large to put in mouths but small enough to handle easily. Respondents had differing perspectives about using authentic items such as fur and bones and whether multiple sets of items were needed.

Social and Communication Skills

On the 2014 special education teacher survey, several respondents indicated they would use distance education programs to develop social and communication skills. This section explores this section of the topical framework.

For respondents working with students with autism, at both lower and higher levels of functioning, communications skills included some of the structural aspects of oral communication and conversation between people.

> *Greetings and closures are a big thing we work on—saying hi to the person. Maybe she says hi Joey, and he says hi, whoever, or just hi. Maybe he uses his talker to do it, just those kinds of things. This is a real person coming to our classroom that we're communicating with, how are we going to use our skills that we practice in school with an outside person. (Group 2 respondent)*

> *Reciprocity. They need to take turns with the presenter. I speak, you speak. And with the other kids in the class because you can end up with a situation where one child is interacting with the presenter and then won't stop. And then nobody else is getting a chance to say anything so the idea of everybody needs a turn, I say this and I stop. I think reciprocity would be something you could handle in a situation. (Group 4 respondent)*

> *Raising their hand—[these are] social skill things that we work on that we would be able to facilitate through the presentation. (Group 2 respondent)*

> *I was thinking maybe like sitting appropriately while listening to a speaker—I mean that's a social skill that we work on. (Group 2 respondent)*

> *Thanking at the end. Thank you is a biggie that we work on. (Group 2 respondent)*

For some students with autism, several even more basic skills involved are very important to practice, especially with someone from someone outside their classroom. Developing appropriate body language is important.

> *And controlling you know their body, you know, where are they putting their hands and body, you know, because a lot of times they don't even know they're doing it but they're grabbing [themselves]—the guys with their pants . . . so we're working on "Don't grab down there." (Group 4 respondent)*

Respondents also said that developing eye contact was an important social skill for many of their autistic students.

> *Getting them used to talking really one on one especially our autism kids, the kids that won't even look at you, you know, and you have to communicate and talk to this person that's talking to you on the big screen or the video, you know, look at them, give them your attention, which is hard sometimes for autistic kids. (Group 4 respondent)*

Group 2 respondents stressed that the social and communication skill their students needed to work on involved questioning skills. Taking turns with the presenter in terms of question and answer is an important skill their students need to develop.

> *Sometimes my children have difficulty asking appropriate questions and also waiting their turn. They might even have those in the box. I know sometimes my kids are so excited about asking the question, and I could just see like—I know my kids always are like, before the guy even finishes, you know, can I talk now? Even if they had little wait signs—like I do have a question—or I don't know, something appropriate that in the box, if I have a question this is what I do. (Group 2 respondent)*

Some students, respondents explained, would not be able to formulate questions to ask the presenter, but they wanted these students to have the experience of participating in this communication activity.

> *We have kiddos—I know I . . . and they can't even come up with the wordage. . . . So they can't participate. . . . Those are the ones you want to go—here's a great question, pumpkin, knock yourself out. (Group 2 respondent)*

Another respondent, who works with students with autism, wants her students to be able to ask a question in the real world, like on social media.

> *I would love something like a social media kind of thing to deal with it. To learn . . . ask a question or message board or something that somebody that is actually in the real world could answer them. (Group 4 respondent)*

In summary, respondents explained that one reason they want their students to have the opportunity to participate in videoconferences was that it presented a framework though which they could learn and practice important communications skills, many of which could

seem obvious to their normally developing peers. For students with autism, greetings and closures, taking turns, raising their hands, and listening quietly while someone else talks are all important social and communication skills. In addition, some students with autism need to develop appropriate body language and practice eye contact. Respondents in other groups, particularly Group 2, focused on their students developing skills in formulating questions and taking turns asking questions to the presenter.

Careers

On the 2014 special education teacher survey, several respondents indicated they would use videoconferences for career education. This concerned Zoo staff members because most zoo careers involving direct contact with animals require master's or doctoral degrees. Staff members wanted to know if such careers were productive to focus on in videoconferences. If not, would teachers be interested in their students learning about support careers at the Zoo—for example, in food service or in the gift shop.

Respondents provided some useful information about context and timing of career education for special education students. Respondents working in several situations stressed that administrators were focused on student outcomes after high school. In one district, the slogan reported was "Career, Core, and College." Another district slogan emphasized that after high school, students should be "Enrolled, enlisted, or employed." This administrator emphasis means that teachers want to incorporate career education across many learning opportunities, including videoconferences. Like science standards, career education content makes videoconferences easier to justify to administrators and coordinators.

Respondents also provided some important information about the timing of career education for students with disabilities. Each student in a special education program has an Independent Education Plan (IEP). Moving from school to careers or further education is called transition for special education students.

> *To explore careers because that's part of the curriculum as well for us. They have transition [goals] in their IEPs that we need to meet. So anything additionally to do with that is always very helpful. (Group 3 respondent)*

> *We have a transition section [in the IEP} that shows up mandatory at age 16, a lot of people start it at 14, but it's mandatory at age 16. So by the time they hit 10th grade, 11th grade, 12th grade we're full blown into a transition focus. (Group 2 respondent)*

Yet career education is not ignored at younger ages, but it is less specific and less focused on students following specific pathways. One SLPS teacher reported:

> *But even with now it's with the city schools they are having us—I work in the high school for two years but they're having us even the elementary schools start talking about careers and what do you want to do, what your interests are. So because that's preparing them for when they go to middle school and they get into high school. (Group 4 respondent)*

Respondents working with older students tended to focus on a special videoconference on jobs at the Zoo and particularly those featuring support positions:

> *I think for my kids it would probably be support staff person maybe, concession work, I'm trying to think. (Group 1 respondent)*

> *Gift shop, yeah. The fact that you could come to the Zoo every day and work. (Group 1 respondent)*

One respondent pointed out it would be helpful for her higher functioning students to understand the educational requirement for different positions:

> *[Transition is] huge for what I do. Everything that I have to talk about is, has to do—they're leaving me in two years, or they're leaving me next year where are we going? They need to be productive members of society. . . . Some people still say they're going to be vets and I've talked to them continuously, 'You have a 4th grade reading level —we gotta get real here!" . . . . So just to say yes they can work at the Zoo, give options . . . . I don't care if it's janitorial, watering the plants, doing the face painting. I don't care if they can say they're at the Zoo. So I would love to see the different levels of [positions featured]. (Group 4 respondent)*

While the respondents teaching older students supported the idea of a full program on jobs, one noted that the topic could be broader—jobs related to animals in general. One respondent cautioned featuring only job at the Zoo:

> *So are you thinking about the idea of careers at the Zoo and only careers available at the Zoo? Otherwise every position that opens up at the Zoo, they're going to get, you know, 1700 kids all applying for the same job. I like the idea of there are lots and lots of possibilities working with animals. Yes, working at the Zoo is the best thing you could possibly do, but in case you don't, here are some other options and ideas. (Group 4 respondent)*

There were specific suggestions about other jobs involving animals.

> *Can we sort of tie in with something with the Humane Society? If the people are onboard with the Humane Society? Because that's animals. . . . There's a lot of—Purina, Ralston Purina, they deal with animals and things like that. (Group 4 respondent)*

> *Or even just put suggestions say think about talking to your local vet's office and see if you can volunteer to learn more about working in this environment. So it gives them—so here are some careers, possibilities, here are some suggestions as to things you can do to see whether you might like something like that. I don't know that we perhaps should make the Zoo responsible for contacting Ralston Purina on our behalf, but if you give a lot of information, say, here's a number you could call. Or perhaps you could try it. And then leave it up to the students and their families to go on from there. (Group 4 respondent)*

For younger children, career education could involve things as simple as the presenter of almost any program describing their job and how they prepared for it.

> *I would just connect it even in your classes. This is my job, I am such and such, I work here. (Group 1 respondent)*

Others suggested a few minutes could be added at the end of programs, where appropriate.

> *I personally would not take the time to do a whole program . . . for kids my age. I mean if it was like the last two minutes of, you know, a Q&A session of what kind of jobs are there at the Zoo or something, and it was embedded within one of these programs, I think that would be fine. (Group 3 respondent)*

In general, career education was a more important issue for respondents working with older students than those of younger students. Transition becomes a part of IEPs for students with disabilities starting at 14 years old and becoming mandatory at 16 years old. In addition, some school districts are placing strong emphasis on this area. Respondents working with older students could envision using a full program on jobs at the Zoo or working with animals. Some of their students have unrealistic expectations about what jobs are open to them but like the idea of working at the Zoo. It could benefit these older students to know about support jobs in the gift shop, janitorial areas, and food service. For younger students, short segments on jobs related to a topic or the videoconference presenter describing his or her job and educational

path would be more appropriate. Respondents working with younger students did not appear interested in using an entire program on jobs and careers.

Technology and Technology Support

This section focuses on technology and technology support available to teachers and students to support distance education. Focus group data where individual responses cannot be connected to individual cases or demographics is not the strongest way to find connections among questions. Yet from analyzing the responses about technology, it became apparent that the available technology, tech support, and comfort level of teachers were areas that were closely connected. Respondents with building-level support generally had Smart Boards and other technology in their classrooms. These respondents were frequently from more wealthy county school districts such as Kirkwood and Lindbergh. Teachers who were less comfortable tended to be from districts such as SLPS; these teachers generally did not have smart boards in their classroom. They were unclear if the technology to do videoconferencing was available to them and if tech support was at the district level.

Technology Available

Many the respondents, about two-thirds, have Smart Boards in their classrooms that would support videoconferencing. Yet others were unclear about whether the technology they have would serve this purpose. Some respondents stated confidently:

> *We have all necessarily equipment to do teleconferencing. We've done some teleconferencing before. And then if there is something that would be kind of unique, we have support available. (Group 3 respondent)*

> *We have a computer, and I have a Smart Board in our room that would be available to videoconference. (Group 3 respondent)*

Yet other teachers were unsure if they had the equipment. As one SLPS teacher explained, there was only one computer in her classroom, and it was they computer she used. As to the other equipment necessary:

> *I don't know . . . . We would have our computer so like a student would have come to us if they want to chat or ask a question or something like, that's what I was kind of envisioning. Unless there was some way. (Group 1 respondent)*

Some respondents in other districts had been moved into temporary space, and while they were lacking some equipment, they believed they could schedule a videoconference.

> *This year so I'm lacking my Elmo and my Smart Board and everything because it's limited space. I do have a computer that can be projected on to a little larger screen, but that's about all I have right now. (Group 3 respondent)*

Technology Support

The level of technology support appeared to closely parallel the availability of equipment. Some respondents had building-level support, others had tech support rotating among groups of schools, and others had to schedule support at the district level. In two instances, a teacher provided tech support to other teachers.

A teacher in the Rockwood School District was confident of tech support. She anticipated that her technology person would be there both for the test and the day of the videoconference.

> *His office is in our building, so I mean he just kind of comes and goes as needed. So I'm sure he would be willing to be there both days for it. (Group 2 respondent)*

A respondent from the Archdiocese of Missouri was similarly confident.

> *If I knew when it was happening, absolutely I could have somebody come and do it. They're not physically in my building, they would have to come but I could arrange that. (Group 3 respondent)*

In contrast, a respondent in a private academy school was much less confident.

> *I am the IT person, which is not very dependable, I can tell you right now. We have a company that I can call, but if I were to do something like this I would make sure that I could get it done. (Group 1 respondent)*

Respondents with only district office support appeared to be less confidence about support and about using technology. A respondent from the Ferguson-Florissant district remarked:

> *Well, we have to call the IT tech guy. He travels to schools. Unless you can get one of the teachers that's more tech savvy than you are and then if they can't figure it out. Then we have to wait for him to come and fix whatever the problem is. (Group 3 respondent)*

An SLPS respondent noted:

> *Our tech support person is actually a teacher, so she's really busy and so I don't know if I'd be able to get her at exactly the time that I would need her. So I'd have to like set it up and probably buy her lunch. But she would probably do it. (Group 3 respondent)*

Another SLPS respondent said:

> *St. Louis public schools does not have in-house tech support. We have a very small staff that's done at our headquarters at 801. I don't know what their availability would be. I mean I've not had that happen where I call them and say can you be here at this time. Typically, if I put in a request it's a few weeks before someone shows up to do any kind of maintenance work. But I don't know. There could be a department I just have not accessed it before. I really don't know. (Group 3 respondent)*

In summary, tech support for teachers appeared to vary by school district and the organization in which they work.

Barriers

I identified three technology areas that appeared to provide barriers to videoconferencing. First, some organizations prevent downloading and installing specialized software by teachers. Second, some respondents noted unreliable service and overloaded bandwidth that prevent streaming video feeds. Third, some students—particularly those with autism who are functioning at a low level—use augmented communication devices for communication.

One respondent pointed out the limitations in downloading and installing software, but this may not be the case for other teachers.

> *We do have a tech team that comes out like if we need special equipment and it's available in the district, they will provide us with that. They kind of limit our access to [installing] things on the computer, but usually if we can justify it to our administrators, they can okay those things [like] installing the zoom—things like that. (Group 1 respondent)*

A few respondents mentioned unreliable service and limited bandwidth.

> *I would just say not reliable service all the time. . . I couldn't tell you if it's my DSL, it's just whatever comes into the building [from] Charter. (Group 1 respondent)*

Like if testing or something was going on, trying to get something to come in and stuff like that; you're constantly looking at the little wheel just going and going. (Group 4 respondent)

Too many people trying to access the same thing at the same time bogs down the whole system. (Group 4 respondent)

Another barrier that the Zoo staff will need to consider is how to communicate with students using augmented communication devices or iPad applications that serve this purpose. These are nonverbal students who may communicate exclusively through their devices.

The four students who previously had aug com devices are using iPads with a—it's called TouchChat, which is a parent-purchased program that is the same. It has icons in it, speaks for the child because they're all—all three of them are totally nonverbal. So it speaks for the child, it's their voice, it is the way they communicate. It is to be considered just like if we're talking, that's their way of communicating. (Group 2 respondent)

This same respondent explained how she and her fellow teachers designed situations to have conversations with these students using augmented communication.

So say all the kids in first grade say good morning Susie—and this child is able to say good morning to each specific student with her aug com device. So it's for social interaction. It's also used for expressing wants and needs. So if they need to go to the bathroom or want a drink of water the goal is for them to actually really be able to communicate, not just with adults but with peers. So a lot of the use of aug com devices depends on the teaching they get as to how to use them. So because that's a whole other piece of it, they have to know how to use it. (Group 2 respondent)

Zoo staff members will need to consider how to address (1) restrictions in some situations against downloading and installing software; (2) unreliable or slow Internet access; and (3) incorporating augmented communication devices.

Information from the Zoo

Among these respondents, the most frequently requested support from the Zoo was a troubleshooting guide. As one respondent commented, most teachers will be new to this experience and so will their students.

I think there's a lot of problem solving we can do just in general, but when it comes to two-way this kind of stuff, that'll be new for my students, though not totally new for me. I've used other systems before—it's just making sure it all works and problem solving . . . there without me having to research to problem solve. (Group 2 respondent)

Another respondent requested:

Like a—just a guide like step by step guide of what you need to do. You know, just like when you're giving—they give you a book when you start a new program at school. Here is your guide. . . . Here's your cheat sheet. (Group 4 respondent)

Another respondent asked for a similar item:

I think it can almost be like a cheat sheet or a quick step card or something like that in the box so I can look at it beforehand. And then I can see, like have a little envelope in there say for me and then that's what I have to look at. (Group 4 respondent)

Comfort Level of Teachers and Testing the System

While many teachers appeared fairly confident about using technology several were not. Respondents were very clear that testing the technology the day before the videoconference was of the highest priority to them. As one respondent who supervised four other teachers explained:

I got all my children in the room and boom, it didn't work, I'd have four sets of parents—I mean four teachers, 19 students and 5 assistants ready to pull their hair out looking at me like you said we'd have 45 minutes today at this time. (Group 1 respondent)

When asked whether or not the same Zoo presenter needed to be present for the test as for the videoconference, respondents in Groups 1, 3, and 4 said that they did not want the students present for the test of the equipment. However, the situation was different for Group 2 respondents who were working with students with autism functioning at a low level. One respondent clarified:

Tell me what kind of test you're running. I heard two different things—I heard that you were running a test to make sure my technology is working. I don't want my kids there because it may not work the first time, we may have to shut down the computer, start it again. Or I heard—then I heard everybody say yes, to a test like hi, I'm Kate, I'm going to be your Zoo person—that's two different tests I hear. (Group 2 respondent)

Several of the respondents in Group 2 working with students with autism functioning on a low level thought that a short interaction between the presenter and the students would be helpful to allow their students to get a feel for a new experience.

Two respondents explained:

> *I was thinking like it would be good for them to—yes they all know, I'm thinking of my room, they all know the Smart Board, they all know how to interact with it. But to sit appropriately and watch an actual live interaction is something they've never had before. So for them to—for that to help predict for the next day of what's going to happen would be a very good idea and a very good calming thing for them to help them understand what's going to happen the next day. (Group 2 respondent)*

Another remarked:

> *I don't know how much interaction goes on. . . . But I think that allows them to see and get an idea of what they'll be—what students they'll be working with. So like they get to experience us as well. So they can prepare. . . . So I think it would just be like good for them as well, not only us. (Group 2 respondent)*

Yet another stated:

> *I mean it would be nice, but I don't think it's like a mandatory thing, but it would be a nice piece to have to help them predict and help them understand what's happening. (Group 2 respondent)*

When specifically asked about student comfort with technology, most teachers rated the students as quite comfortable.

> *I would say it's probably close to their peers. I have one student who has her own personal tablet so she uses that and all the other kids in the room, whether they have one at home or not, they get the swipe motions and things like this. (Group 1 respondent)*

One described a student who gave the tech support unit headaches:

> *I have one student that—and we're not so nicely technologically taken care of because our students, no matter how many firewalls we have, we have to actually limit children, a few children, on the computer because they are so good at getting past whatever we have set up. If we don't have somebody right beside them, they can click past like a normal adult because we're*

not quick enough. So they don't even get to go on the computer unless they're with an adult who's actually really paying attention. (Group 1 respondent)

In summary, respondents described some gaps between school districts with technology and technology support that would support videoconferences. Barriers to using videoconferences beyond technology and technology support appeared to be restrictions to installing software, unreliable service or narrow bandwidth, and incorporating augmented communication devices into the videoconference exchanges. Teacher comfort appeared closely connected to level of support, and most respondents placed a high priority on an equipment test prior to the videoconference to make certain everything was working. Only respondents with students with autism functioning at a low level wanted a test experience to prepare their students for the actual videoconference. Respondents rated their students' comfort with technology close to that of their age-group peers.

Conclusions and Recommendations

Naturalistic inquiry (Lincoln & Guba, 1985) involves evaluators, such as I, providing deep description so that users of the evaluation can see how conclusions and recommendations were reached. This deep description is provided in the Findings section. In this section, readers will find conclusions and recommendations I reached by carefully analyzing the data. Yet, given readers different background and experiences, they may reach other conclusions and have additional recommendations. The conclusions and recommendations in this section also serve as a model for how to translate the information in the Findings section into action.

What are teachers looking for when they select a Zoo Distance Learning program?

Selecting and Rejecting Programs

Respondents provided some very some very clear criteria about what they are looking for in selecting distance learning programs. They want programs that:

- Fit their curriculum
- Provide appropriate physical activity
- Include opportunities for connections to life and life skills
- Seem age-appropriate in content and activities
- Appear exciting and interesting
- Include appropriate interactivity
- Involve cross-curricular content
- Provide exposure to live animals
- Suggest activities for follow-up
- Provide concrete examples of concepts they are teaching

Respondents in these group rejected programs that

- May create issues for students with specific disabilities
- Contained no apparent connection to their curriculum
- Did not appear to be a special experience
- Included concepts they judged too abstract or complicated for their students
- Suggested prior life experience was needed that their students do not have

In general, the highly structured, brief program descriptions appeared to work well for respondents to scan information quickly and reach a reasoned decision. Some tweaks to the description are supported by the findings in this study.

Text descriptions of programs should be carefully reviewed to see if they clearly provide the information teachers are seeking. Criteria for both selecting and rejecting programs should be considered along with more detailed information about what the criteria mean from the Findings section. One key piece of information for respondents appeared to be the specific content of the program so they could make connections to their curriculum and decisions about the level of abstraction in relation to their students. Another particularly important piece of information appeared to be the nature of the interactive and physical movement. Teachers need to be able to decide if their students can participate in the ways described or prepared prior to the program so they can participate.

Rejection criteria are important to consider too. Are the programs likely to include animals that could frighten some students? If so, this information needs to be included. Careful attention needs to be paid to the red flags respondents identified so they have the information they need to make a good decision. The Findings section of this report may provide useful information in grasping the meaning of each of these criteria that are presented here at a very general level.

Next, respondents wanted pricing presented for each of the programs, along with the other information. If that is an issue for website maintenance, then the prices should be removed from the two items on which they appear.

In a theme that ran across several responses, teachers asked for the name of a contact to call to ask additional questions about the program. Even more than teachers working with developmentally normal students, teachers of students with disabilities appear very careful in selecting appropriate experiences for their students. I interpreted this and other recommendations for communication with presenters, as a request for Zoo staff members to personally be their partners in meeting their students' needs.

The Distance Education department should also consider producing short clips (three to five minutes) in which the presenter(s) introduce themselves and preview what will happen in the program. These clips need to appear online so that teachers can use them to clarify the nature of the videoconference and to prepare students for the program.

Cost of Programming

Based on information from respondents in these four focus groups, cost may provide the strongest barrier preventing use of videoconferences in schools with students with disabilities. Yet this situation is neither straightforward nor simple. Cost is important because funds for

videoconferences are not in teachers' classroom budgets. They have to make the case for funding to a range of other stakeholders.

In general, respondents explained that teachers do not have control over the decisions about whether to use a videoconference in their classroom because their classroom budgets would not cover the cost. Teachers have to make a case to one or more avenues to obtain the funds to offer a videoconference. Avenues or funding sources that teachers talked about using include:

- Making a case to building principals or SSD coordinators to obtain funding
- Writing grants for pools of internal monies
- Writing grants to foundations or charities
- Raising funds on public websites.

Teachers need information in the program descriptions, video clips previewing the program, or through other resources to help make the case for using a videoconference with their students. Standards such as the Missouri GLEs are very important parts of this justification. Yet equally important is providing means, such as the video clips, to introducing those unfamiliar with videoconferences to what the experience would be like for students.

In addition to video clips, the Zoo Distance Learning staff should consider collecting evidence about the impact of their videoconferences. Respondents indicated the importance of a research-based curriculum, and empirical evidence as another important piece in justifying expenditure. For example, a survey of teachers using videoconferences could provide feedback about how they were used and some overall ratings of value that could be shared on the website and used by other teachers in justifying expenditure. In addition, selecting one or two popular programs and experimenting with ways to measure impact could be productive and provide empirical evidence for justification. Empirical evidence is not the only type of information that justifies expenditure, but it is an important piece of the puzzle.

Finally, a few teachers who have written successful grants for programs or have successfully raised funds on public websites could be asked to share their efforts. These could be available on request by teachers who want to schedule a videoconference or they could be summarized in a document providing tips on writing successful grants or developing successful web posts for donors.

What recommendations do teachers have about how to capture the attention of and maintain engagement with students with various types of special needs?

Items Teachers Want to Prepare for Videoconferences

The Findings section contains numerous recommendations directly from respondents about how to capture attention and maintain engagement. The most important conclusion that emerges from the discussion of these findings is that maintaining attention and engagement is not just about what happens during the videoconference itself. Particularly among students with disabilities, teachers need to prepare the young people for this experience so they can engage productively. This means that the Zoo Distance Education staff needs to consider what materials are practical and possible to develop and share with teachers prior to videoconferences. The highest priorities appear to be vocabulary lists (five to 10 key words) and lists of items in boxes or kits. Responses from focus groups indicate that these items are needed for all programs, and it would be helpful if they could be available online so that teachers could review them as part of their selection process.

Video clips introducing presenters would appear to be the next priority. Since these will take some time to produce, I recommend that three or four be produced and shared with respondents from focus groups for feedback. Making these clips highly structured may make their production and utilization easier and more effective. For example, scripts could have a standard format:

1. Introduction of the presenter
2. Explanation of what it is like to participate in a videoconference
3. Preview of activities and concepts in a specific program

A Teachers' Guide and lesson plans are more ambitious undertakings. The staff time and effort to develop these materials, along with the inclusion of expertise from professionals with special education curriculum development, could require additional funding outside the department budget. If such development is undertaken, the strategies used in the Unique curriculum (e.g., differentiated instruction), New-2-You, and Mayer-Johnson products could provide promising models. Special education as a field is based on considerable research, and curriculum developers would need to be familiar with and apply this research in the design of materials.

Maintaining Student Attention and Engagement

Respondents shared ideas about how to capture and maintain attention and engagement before, during, and after the program. Distance Education staff members at the Zoo can use

some ideas and strategies to consider simple one pagers for teachers to get them to think about how they would prepare pre- and post-activities for videoconferences. If time and budget allow, staff members can consider adding to vocabulary lists and lists of items in boxes for each program and to develop specific suggestions for each program. One way to prioritize this effort would be to look at the three most popular videoconferences selected by respondents in the focus groups and start with these programs. Higher priority programs would include *Fall into Winter*, *Critter Gardens*, and *Animal Champions*. Staff members should remember that all efforts making programs more effective and engaging for students with disabilities may be very useful for general education teachers, too.

Before the Program

Before the program, respondents suggested a variety of strategies to make this new experience (videoconferences) more comfortable and to pre-teach so their students could participate. Activities included:

- Learning vocabulary.
- Hands-on objects
- Viewing pictures of animals involved and learning their names
- Watching video clips about the animals or topic
- Watching a video clip introducing the presenter and program topics
- Reading books and stories
- Researching the topic
- Writing and journaling to prepare to learn

During the Program

Respondents also had several suggestions about how to maintain attention and engagement during the program. These suggestions were about presenter style and techniques, pacing and structure, and length of the programs.

Zoo staff members should consider reviewing program scripts to see if these suggestions can be incorporated. In addition, tip sheets could be developed from this information about working with students with autism who are functioning at a low level.

Suggestions about presenter style:

- Be animated and enthusiastic with all students with disabilities.
- For students with autism who are functioning at a low level:
    - Be prepared to keep moving on through the program even in the event of some bad language and a few meltdowns in classrooms with students with autism who are low functioning.

- Use basic, simple language.
- Give students processing time.
- Use appropriate questioning techniques.
- Prepare students for any surprises.
- Recap and review during and at the end of the program.

Suggestions about pacing and structure:

- Have an agenda.
- Have a brain break or movement break half-way through programs.
- Recognize that programs could take a little long for students with disabilities.

Activities respondents suggested:

- Use music and sounds.
- Provide materials for students at their desk to help focus their attention during the videoconference.

After the Program

Respondents across all four groups had suggestions for appropriate follow-up activities that would engage students and extend learning:

- Include hands-on experiences.
- Connect to someone at the Zoo for follow-up questions.
- Use activities to demonstrate learning.
- Have students participate in projects such as designing animals or making books.
- Encourage student writing and journaling.
- Consider video projects as a way to reflect on learning.

Recommendations about Materials for Boxes

Zoo staff members wanted recommendations from respondents about items to include in boxes sent to the school to accompany the videoconferences. Respondents recommended that items selected for boxes be hands-on, colorful, and interactive. Characteristics of items not to send in the box include those things that are easily broken, irreplaceable, and items small enough to be placed in the mouth.

Respondents were not in complete agreement about some of their recommendations. One area related to authentic items. Some recommended real items such as furs and owl pellets. Other did not want fur because of allergies or the possible inclusion of any real bones. There was also a range of ideas about whether multiple sets of items in boxes were needed. Some

respondents requested multiple sets of items so students would not have to wait. Others believed sharing and waiting were appropriate social skills for students to develop.

What methods and program elements support the development of social and communication skills among students with special needs?

Respondents explained that one reason they wanted their students to have the opportunity to participate in videoconferences was that it presented a framework though which students could learn and practice important communications skills, many of which could seem obvious to their normally developing peers. For students with autism, greetings and closures, taking turns, raising their hands, and listening quietly while someone else talks are all important social and communication skills. In addition, some students with autism need to develop appropriate body language and practice eye contact. Respondents in other groups, particularly Group 2, focused on their students' developing skills in formulating questions and taking turns asking questions to the presenter.

Videoconference developers and presenters need to be aware of these developing skill areas for students with disabilities. Most respondents said they would like direct communication with presenter(s) by email or on the phone prior to the videoconference. Zoo Distance Education staff members could consider developing a set of five or six question to ask teachers on the phone or by email. One of these questions could be about the social and communication skills the teacher is focusing on with her specific class.

What recommendations do teachers have about which Zoo careers to highlight for students with various special needs?

In general, career education was a more important issue for respondents working with older students than younger students. Respondents working with older students could envision using a full program on jobs at the Zoo or working with animals. Some of their students have unrealistic expectations about what jobs are open to them but like the idea of working at the Zoo. It could benefit these older students to know about support jobs in the gift shop, janitorial areas, and food service. For younger students, short segments on jobs related to a topic or the videoconference presenter describing his or her job and educational path would be more appropriate. Respondents working with younger students did not appear interested in using an entire program on jobs and careers.

Zoo Distance Education staff members should consider the pros and cons of developing a videoconference about jobs at the Zoo. As one respondent noted, such a program could

overwhelm the Zoo with job applicants. It may be that, considering its mission, committing this time and effort is not an investment the Zoo wants to make. On the other hand, starting to think about one- or two-minute sections of videoconferences that feature Zoo jobs, or even any Zoo employees with disabilities, could be productive and make videoconferences more attractive to teachers.

To what extent and in what ways can the Zoo Distance Learning program support successful use of technology by teachers and students?

There appeared to be some gaps between school districts with technology and technology support that would support videoconferences and those with less technology and support. Several wealthier County districts have higher levels of technology and support, and SLPS and some of the less wealthy County schools have lower levels. Barriers to using videoconferences beyond technology and technology support appeared to be restrictions to installing software, unreliable service or narrow bandwidth, and incorporating augmented communication devices into the videoconference exchanges. Teacher comfort appeared closely connected to level of support, and most respondents placed a high priority on an equipment test prior to the videoconference to make certain everything was working. Only respondents with students with autism functioning at a low level wanted a test experience to prepare their students for the actual videoconference. Respondents rated their students' comfort with technology close that to their age-group peers.

Zoo Distance Education staff members should develop a set of five or six questions, of which one clearly asks about the types of technology and technology support available. Since respondents received free videoconferences as an incentive for participation, I strongly recommend that staff members involved in testing programs and presenting programs write brief formal debriefs after each teleconference, including the school district and other organizational setting, citing of any problems or issues, and making any recommendations about technology support. Debriefs such as these could provide sets of ongoing records to inform decisions about how to support teachers and districts that may require the greatest level of support.

Of what specific considerations does the Zoo Distance Learning staff need to be aware in designing and conducting distance education programming for students with different types and levels of disabilities?

First, these focus groups point to several areas that Zoo Distance Learning staff members need to consider in designing and conducting programs for students with disabilities. It may be necessary to engage with greater levels of communication with teachers of students of disabilities than with general education teachers. Special education teachers appear highly attuned to the individual differences among their students and the overall chemistry these differences provide for the class as a group. Presenters will probably be most successful and comfortable if they have a discussion, by email or phone, and work with the teacher as partners.

Second, it appears that students with autism functioning at a low level may be the most challenging for Zoo Distance Learning staff to work with and meet their needs. I highly recommend that before embarking on videoconferences with these students that staff members follow respondents' advice and visit these classrooms with an eye to doing videoconferences. Unlike regular outreach programs, videoconferences could require at least some adaptation to allow communication with augmented communication devices. Both teachers and presenters would need to pre-plan parts of the videoconference where this communication would work and carefully structure it. Videoconferences with these students could be wonderful experiences, but they will require the expertise of the teacher as well as presenters who want to develop their own expertise.

Zoo staff members may also need to consider that working with K-4 students with physical and mental disabilities may involve a greater focus on developing oral and written communication skills than on science curriculum. Again, close collaboration with teachers is recommended.

Additional time may be needed for students with all types and levels of disability. Many of these students can accomplish the same things as their age group peers, but it may take them longer. Time should be allotted for additional communication, preparation, and actual time online with the students.

Finally, Zoo Distance Learning staff members may want to consider ways to build their own knowledge and expertise in working with students with disabilities. Field trips to classrooms

could be considered, along with articles read and staff meeting discussions. Creating opportunities for summer internships for special education teachers could be another way of increasing the funds of knowledge and expertise to develop memorable and engaging experiences for young people with disabilities.

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Appendix A: Topical Framework

Overarching Questions

1. What are teachers looking for when they select a Zoo Distance Learning program?
2. What recommendations do teachers have about how to capture the attention of and maintain engagement with student with various types of special needs?
3. What methods and program elements support the development of social and communication skills among students with special needs?
4. What recommendations do teachers have about which Zoo careers to highlight for students with various special needs?
5. To what extent and in what ways can the Zoo Distance Learning program support successful use of technology by teachers and students?
6. Of what specific considerations does the Zoo Distance Learning staff need to be aware in designing and conducting distance education programs for students with different types and levels of disabilities?

Teachers' Reasons for Selecting Distance Education Programs

1. What are teachers looking for when they select a distance education program?
    a. What specific elements do teachers look for in program descriptions that help them decide a distance education program would be appropriate for their students?
    b. Ideally, what are the big things a distance education program should cover and include to make it work for students with special needs (e.g., positive interaction with animals)?
    c. To what extent and in what ways are science content and connections to state and district curriculum standards important to teachers in selecting a distance education program?
    d. To what extent and in what ways does the cost of programming affect the selection of programming?

Attention and Engagement

1. What recommendations do teachers have about how to capture the attention of and maintain engagement with students with various types of special needs?

a. What recommendations do teachers have about how to capture and maintain the attention of students with various types of disabilities before, during, and after a distance education program from the Zoo?
b. If boxes were created to send to schools to be used with programs, what types of materials are appropriate and inappropriate to support learning and engagement?
c. If boxes of materials were sent to classrooms, how would teachers use them to support learning from the Zoo programming?
d. What other activities or methods (e.g., Questions and Answers, drawing pictures, concept mapping) would teachers suggest to support interaction and engagement as part of the program design?

Social and Communication Skills

2. What methods and program elements support the development of social and communication skills among students with special needs?
    a. Teachers responding to the survey indicated that they would use distance education programs to support the development of social and communication skills. How do teachers envision distance learning programs being used to develop communications and social skills?
    b. What elements should be included in the distance learning programs to accomplish these outcomes?

Careers

3. What recommendations do teachers have about which Zoo careers to highlight for students with various special needs?
    a. What is educational and career pathways are open to students with various special needs (autism, physical disabilities, mental disabilities)?
    b. To what extent are the educational requirements for many zoo careers (master's and doctoral degrees) attainable for students with various levels and types of special needs?

Technology and Technology Support

4. To what extent and in what ways can the Zoo Distance Learning program support successful use of distance learning technology by teachers and students?
    a. What technology is available to teachers and students to support distance learning?

b. What technology limitations do teachers have that provide barriers in using distance learning programs?
c. What are the levels and nature of technology support available to teachers?
d. What information and support can the Zoo provide to make technology work better for teachers and students (e.g., tests the day before a program, set-up and problem-solving checklists)?
e. How comfortable and confident are teachers in using the technology involved in distance learning?
f. What is the skill and comfort level of students with various commonly used technologies such as smartphones, tablets, and computers?

Specific Considerations and Adaptions

5. Of what specific considerations does the Zoo Distance Learning staff need to be aware in designing and conducting distance education programs for students with different types and levels of disabilities (autism-high functioning and low functioning, physical disabilities, mental disabilities)?
    a. To what extent is consistency (e.g., the same presenter for testing and the program) important for teachers and students?
    b. To what extent do teachers use Zoo distance education programming with students with similar special needs, a mix of special needs, or in a mainstreamed context?

Appendix B: Focus Group Script

Saint Louis Zoo Distance Education
Focus Group Script

Room Set Up:

- Table near the door for sign-in sheets, Informed Consent Forms, and table tents. For the group
- U-shaped or rectangular table with chairs on all sides of the table.

Timeframe: The evaluator will arrive at one hour before the start time to check room set up and equipment. Hosts from the Zoo Distance Education Program will greet teachers and coordinate the signing of Informed Consent Forms and show them how to make table tents. (*Table tents, in contrast to name tags, allow the focus group facilitator to easily see respondent names during the discussion. Making the table tents, and decorating them if they wish, gives a relaxed, hands-on feel to open the interaction.*) People can eat as we begin.

Introduction

Thank you for being here. My name is Carey Tisdal. and I do studies with people like you to help zoos, museums, and science centers make good decisions about their exhibits and programs. You were invited tonight to talk about distance education programs. Currently, the Zoo has a project to improve their distance education program. With funding from The Tilles Foundation, they created dedicated space for distance learning programming. Another goal of this project is to develop a specialized curriculum for students with special needs. Your input is very important in accomplishing this second goal.

Staff members in Distance education need to know what teachers want and need, and the characteristics of the experiences that help their students grown and learn. In May of this year, the Zoo conducted an online survey of the teachers of special needs students. Most of you responded to that survey. While the survey provided very useful information, the Distance Learning staff members had additional questions and need a more detailed explanation to make decisions. That is why we are conducting these focus groups.

There is no right or wrong answer in a focus group as long as you say what YOU really think. While I am certain all of you want to be polite and tactful, if you answer frankly and candidly, it will help make the programs better for students like yours.

Just a little more information. I am not a staff member at the Zoo. They arranged with me to collect information to help make good decisions in designing the program. I will write a report, but I won't use your name when talking about what you say. Some Zoo staff members are observing and you may know them from previous interactions. So all your comments may not be completely anonymous.

I will be taking notes, but I am also recording our conversation. This audio recording will be transcribed so I can summarize and report on our discussion. Please turn your table tents toward me so I can see your names.

Here are some rules of the road that will help me make sure to record and understand what you say:

- I would like to ask that only one person talks at a time—please wait until the person is finished before you talk. That way, we get everyone's answer on the audio recorder.
- Everyone's answers are good ones, listen respectfully—and we will take turns answering.

Finally, you'll notice a response sheet in front of you. Please put your first name on top right now—I won't use your name in any report, but it really will help me match up what you mark and what you say. Thanks for your help on that!

Do you have any questions before we start?

Establish Rapport and Response Set

1. Just to get started, let's go around the circle. Please tell me your name and then tell us about the type of organization in which you work and the students you teach. (Go sequentially around the group to establish longer answers and everyone contributing.)
    - Probes if not in original description: What subjects do you teach? How old are your students? What types of disabilities do you students deal with?

2. How many of you have been to the have used a Zoo Distance Education program? Show of hands? [Say names aloud for observers and recording.]

Teachers' Criteria for Selecting Distance Education Programs

Next, I am going to ask you a few questions about to get a better understanding of what teachers are looking for when they select a distance education program. Each of you has a Response sheet in front of you. Read through the questions and mark YES by the two programs you would be MOST likely to schedule and NO by two programs you would be LEAST likely to schedule. (Wait for most people to finish.)

3. What additional "general information" about videoconference do you need?
4. Tell me <u>why</u> you marked the two programs as the MOST likely to schedule. (Go around the circle in the other direction.)
5. Here are some of the things I heard that sounded like selection criteria. Are there any other important things you look for in selecting programs that would work for YOUR students? Probe: Why are these things important?
6. Tell me <u>why</u> you marked two programs as LEAST likely to schedule. (Reverse direction.) Follow up: Here are some of the things I heard that appeared to exclude scheduling some programs. Are there any others?
7. Each of these programs has information about the science content area and connection to state standards. To what extent is that important is that information to you? Probe: How do you use this information?
8. On the back of your response sheet is information about program pricing. To what extent is the cost of programming important to you in selecting a program? Probes: At your school, what is the source of funding for programs like this? Does anyone need to approve your selection? If so, what criteria do they use in approving your decisions?

Attention and Engagement

We know that capturing attention and engaging students is a very important part of learning.

9. Generally, what activities or methods (e.g., Questions and Answers, drawing pictures, concept mapping) would you suggest to support interaction and engagement for your students?

10. What recommendations do you have about strategies and techniques to capture students' attention BEFORE a program? Probe: What types of engagement do you recommend?

11. In survey responses, several teachers recommended that Zoo Distance Learning instructors be trained to present to students with specific types of disabilities. What presentation strategies and techniques would help YOUR students have a good experience?

12. What recommendations do you have about strategies and techniques to maintain students' attention AFTER a program? Probe: What types of engagement do you recommend to help them reflect on their experience?

13. Look back to the programs you said you would schedule. If boxes of materials and activities were created to send to schools to be used with those programs, what types of materials do you think would be appropriate to engage and extend learning?

14. Looking back to those same programs you said you would schedule, what types of materials would it be a <u>bad idea</u> to include in boxes sent to schools?

Social and Communication Skills

15. On the survey, several teachers said they would use videoconferences to support the development of social and communication skills. How do you see distance learning programs being used to develop communications and social skills?
    Probes: What elements should be included in the distance learning programs to accomplish these promote communications? What strategies should be included in the programs to develop social skills?

Careers

On the survey several teachers noted that they would use distance learning programs to expand their students understanding of careers at the Zoo. We need to get a better understanding of how teachers are thinking about this.

16. Tell us about the educational and career pathways that are OPEN and NOT OPEN to the students you teach. (It would help if you would connect your descriptions to specific disabilities so programs can be designed and adapted.)
17. Many zoo careers require advanced degrees (masters and doctoral degrees). Are these types of careers options for YOUR students?

18. Some jobs at the Zoo don't require advanced degrees, for example, those in food service, the gift shop, or operations. Are you interested in your students learning about other careers at the Zoo that may not require advanced degrees?
19. How do you suggest we address this area? (E.g., additional program? activities?)

Technology and Technology Support

1. At your school, what technology is available to teachers and students to support distance learning? Probe: Which of these items do you have?
   - High-speed Internet connection
   - PC or Mac computer
   - LCD Screen, overhead projector, or Smart Board
   - USB web camera
   - Computer speakers and microphone or a USB speakerphone

2. At your school, what do you see as technology barriers to using distance learning?

3. What are the levels and types of technology support do you have at your school? Probes: Who would set up and test the technology for a videoconference at your school? If something wasn't working, who would you call?

4. What information and support can the Zoo provide to make technology work better for teachers and students (e.g., tests the day before a program, set-up and problem-solving checklists)?

5. How comfortable and confident are you personally in using the technology involved in distance learning?

6. What is the skill and comfort level of your students with commonly used technologies such as smartphones, tablets, and computers? Probe: Are there any technologies that are particularly challenging for your students?

Questions:

During our conversation, some Zoo Distance Education staff members have been listening and writing down some areas they would like you to talk more about. (Get questions written on index cards from Zoo staff members.)

Thank you so much for taking the time to share your perspectives and expertise this evening. Your input will make the distance education experience for a wide variety of students better. We appreciate your help. A staff member will have your gift cards as you exit.

Appendix C: Response Forms

First and Last Name _____

Response Sheet

Please read though information on this sheet about distance learning programs from the Saint Louis Zoo. Think about these questions:

- What elements of the general information (green box) are MOST important to you?
- What additional general information do you need?
- If cost were not a factor, which two programs would be MOST likely to schedule? Please write YES on the line beside these program titles.
- If cost were not a factor, which two programs would you be LEAST likely to schedule? Please write NO on the line beside these program titles.

When you are finished we will talk about why you made those choices.

Videoconferencing Programs

The Saint Louis Zoo presents classes using state-of-the-art Polycom videoconferencing equipment. Connect with us to take virtual tours of various areas of the Zoo and learn about animal adaptations, habitats and conservation programs. All programs are interactive and utilize live animals from our Emerson Children's Zoo, video footage from the award-winning KMOV Channel 4 "At the Zoo" show and other means to create a memorable learning experience. At this time we do not have the ability to broadcast remotely from Zoo exhibits.

Requirements for scheduling sites: A minimum connection speed of 384k preferred. We can connect to organizations directly via IP technology to traditional H.323 equipment. For schools without traditional equipment, we can connect to PC and Mac computers using FieldTripZoom. Please visit the FieldTripZoom website for more information, or download a Getting Started Guide (60KB PDF).

National Science Education Standards

Our programs have also been aligned to the following National Science Education Standards, depending on the grade level:
NS.K - 12.1 Science as Inquiry
NS.K - 12.3 Life Science
NS.5 - 12.6 Science in Personal and Social Perspectives
Click here for information on pricing (PDF).
To get more information or schedule a program, please contact the Outreach Coordinator at (314) 646-4754 or e-mail outreachrequests@stlzoo.org

_____ Critter Calls (NEW!)

(K - 2nd grade)
Program Length: 30 minutes
NOTE: This is a 30 minute program. The cost for this 30 minute program only is $95.00.
A cow says "moo" and a sheep says "baa," but what owl says "who cooks for you?" In this program we'll practice our animal sounds and meet a few special Zoo friends. If we're lucky, they might even 'talk' to us!
Missouri Science Grade Level Expectations: III-1D (K) a; VII-1A (K) a, 1B (K) a, 1C (K) a

_____ Baby Animals

(K - 2nd grade)
Program Length: 30 minutes
NOTE: This is a 30 minute program. The cost for this 30 minute program only is $95.00.
One of the most exciting things at a zoo is when babies are born! In this program, we'll be introduced to some of the babies that have been born at the Saint Louis Zoo, via recorded video. We'll also learn special baby names, as well as how animals care for their babies.
Missouri Science Grade Level Expectations: III-1A(1)a,(2)a, 3D(K,2)a,b; VII-1A(K,1,2)a

_____ What Is an Animal?

(K - 3rd grade)
Program Length: 45 minutes
How do you know if something is alive or not? If it is alive, how do you know if it's a plant or an animal? Take part in activities to understand the characteristics of living things. Meet live animals to help identify these traits.
Missouri Science Grade Level Expectations: III-1D(kg)a, 1D(1st)a,b,c,d, 1E(1st)a VII-1A(kg)b, 1A(1st)b, 1A(2nd)b, 1A(3rd)b, 1C(kg)a,b, 1C(1st)a,b,c, 1C(2nd)a,b,c, 1C(3rd)a,b,c,d

_____ Critter Garden

(K - 3rd grade)
Program Length: 45 minutes
Do you like to play outside? Animals like to play outside in the flowers, by trees, and in water. Color, play with stickers, match pictures, and meet animals that live near your home as we learn what we can do to help our backyard friends.
Missouri Science Grade Level Expectations: I -1A (K,1,2,) a,b,c I-2C (K,1,2) a I-3A (K,1,2) a,b,c III-1D (1st) a,b,c,d III-1E (1st)a IV-1A (1st) a

_____ Sea Lion Sound

(K - 5th grade)
Program Length: 45 minutes
Meet our furry seal and sea lion friends as we explore their underwater home at the zoo! Dive right in and participate in activities to learn about how these animals survive in the water, on land, and with each other at our newest exhibit at the Zoo!
Missouri Science Grade Level Expectations: III-1A (1st) a, 1B (2^{nd}) a, 1C (5^{th}) a, 1D (1^{st} , 5^{th}) a,b,d, 1E (5^{th}) a,d

_____ Zoo Clues

(K - 5th grade)
Program Length: 45 minutes
Solve puzzles to learn more about big cats, birds, and other animals in this interactive class. Learn about the clues our veterinarians use to keep our animals healthy.
Missouri Science Grade Level Expectations: III-1A (1st) a, 1D (kg) a, (1st) b, d, (5th) a, 1E (5th) c, d, IV-1A (Kg) a, (4th) a, b, 2A (4th) b, c, 3C (4th) b, c, d. VII-1A (Kg-3rd) a, b, (4th-8th) a, b, c, 1C (Kg-2nd) a, b, 1D (Kg-2nd) a, (3rd-8th) a, b

_____ Animal Champions

(K - 5th grade)
Program Length: 45 minutes
Can you run as fast as a cheetah or leap like a lemur? This interactive program will introduce students to animal adaptations and how they help animals survive. Physical activities and live animal guests make this program a winner!
Missouri Science Grade Level Expectations III-1A(1)a; IV-1A(4th)a; VII-1B(3rd)a,d

_____ Fall into Winter

(K - 6th grade)
Program Length: 45 minutes
Discover changes animals endure in order to survive in places where the weather turns cold. Some animals stay where they are and others make journeys to new places each season. We'll learn about different animals and what they do through interactive presentations and live animal encounters. You'll also find out how the Saint Louis Zoo helps animals survive through this harsh season. NOTE: Different versions exist for K-3rd grades and 4th-6th grades.
Missouri Science Grade Level Expectations: III-1A(1st,2nd)a, 3D(K)a; IV-1A(K)a,b; V-2F(K)b; VII-1A(K, 1st, 2nd)a, 1C(K,1st,2nd)a, 1D(K,1st,2nd)a, III-1A(6th)a; IV-1A(4th)a; VII-1A(4th,5th,6th)a, 1C(4th,5th,6th)a

_____ Spring into Summer

(K - 6th grade)
Program Length: 45 minutes
Learn how animals celebrate the return of spring as we explore the different ways animals make the switch from cold winter days to warm summer nights. NOTE: Different versions exist for K-3rd grades and 4th-6th grades.
Missouri Science Grade Level Expectations: III-1A(1st,2nd)a, 3D(K)a; IV-1A(K)a,b; V-2F(K)b; VII-1A(K, 1st, 2nd)a, 1C(K,1st,2nd)a, 1D(K,1st,2nd)a, III-1A(6th)a; IV-1A(4th)a, 1D(4th)a; VII-1A(4th,5th,6th)a, 1C(4th,5th,6th)a

_____ Penguin & Puffin Coast

(K - 8th grade)
Program Length: 45 minutes
Meet our adorable penguins and puffins and learn about the cold areas in the northern and southern hemispheres of the globe. Participate in activities to learn about how these animals survive in their cold climates.
Missouri Science Grade Level Expectations: III-1A (1^{st})a. 1D (Kg)a, (1^{st}) b,d, (5^{th})a, 1E (5^{th})c,d, IV-1A(Kg)a, (4^{th})a,b, (6^{th})a, 1B (6^{th})a,b, 1D(6^{th})a, 2A (3^{rd})a,b, (4^{th})a,b,c, 3C (4^{th})a-d, (6^{th})a,b, VII-1A (Kg-3^{rd})a,b, (4^{th}-8^{th})a,b,c, 1C(Kg-2^{nd}) a,b, 1D(Kg-2^{nd})a, (3^{rd}-8^{th})a,b

_____ Mathimals (NEW!)

(K - 12th grades)
Program Length: 45 minutes
How much hay do you need to feed seven elephants? Can you draw an animal exhibit design to scale? This interactive program will include videos, live animals, and hands-on activities that demonstrate the importance of math in the Zoo world. Please speeify grade level and concepts being studied when requesting the program.
Missouri Science Grade Level Expectations:Dependent upon grade level. Please contact for specifics.

_____ The Dirt on Dirt

(2nd - 8th grades)
Program Length: 45 minutes
Dr. Worm, expert vermicomposter, will show you the dynamic world of decomposers. Find out how dirt made your lunch, investigate a worm's habitat, and even meet a few new wiggly friends. Learn why worms are important and how they help eat our garbage.
Missouri Science Grade Level Expectations: III-1A (1^{st}) a,b (3^{rd}) a, (5^{th}) a,c,d; IV-1A (1^{st}) a, (4^{th}) a, 2A (3^{rd}) a, b,c,d, (4^{th}) a; VII-1A (K,1^{st},2^{nd},3^{rd}) a,b, 1B (K, 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, 5^{th}) a, d, 1C (K, 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, 5^{th}) a, b, 1D (K, 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, 5^{th}) a; VIII-3A (K, 1^{st}, 2^{nd}) a

_____ Grossology (NEW!)

(4th - 6th grades)
Program Length: 45 minutes
Poop, vomit, and slime make this class a guaranteed gross time! We'll investigate why animals do 'gross' stuff, how it helps them to survive, and meet some disgusting animals – and you might be surprised by who you'll meet!
Missouri Science Grade Level Expectations: III-2A (5th) a; 1A (6th) a; IV-1A (4th) a; 3C (4th) b,c; VII-1A (4th, 5th, 6th) a; 1C (4th, 5th, 6th) a

_____ Zoobusters (NEW!)

(4th - 8th grades)
Program Length: 45 minutes
Can you get warts from a toad? How do snakes smell their prey? In this program, we'll examine at some common misconceptions that people may have about animals and, with the help of some live animal guests, bust those misunderstandings!
Missouri Science Grade Level Expectations: III-1A(1st)a, 1E(5th) d, VI-1A(1st)a, 1A(4th)a, 1D(4th)a, 1D(8th)a, 1D(9-11) a,b, 3C(4th)d.

_____ Animal Behavior

(6^{th}- 12^{th} grade)
Program Length: 45 minutes
Have you ever wondered why animals do certain things? Is animal behavior important in a zoo? In this program, we will discover why scientists study animal behavior and how we study animal behavior at the Saint Louis Zoo. Students will be able to practice during a live animal observation.
MO GLE:IV-1D(6^{th}) a, 3C (6^{th}) b; VII-1C(6-8^{th}) a,b; IV-1A (9-11th) a, 1B (9-11th) a,b, 1C (9-11th) a,b, 1D (9-11th) a,b; VII- 1A (4th) a,b,c (5th) a,b,c,d
NGSS:MS-LS1.B, MS-LS2.A, MS-LS4.C,D, MS-ETS1.A,B,C, HS-LS4.C,D

_____ Animal Training

(6th - 12th grade)
Program Length: 45 minutes
Animal training is important for successful animal husbandry, veterinary care, and enrichment. Learn how and why we train animals at the Saint Louis Zoo, as well as how training has changed. We'll review techniques, observe animals in training sessions, and test your trainer skills in this interactive program.
Missouri Grade Level Expectations: IV-1B(6th)a,b,c, 1D(6th)a,b,c, 2A(6th)b, 3A(8th)a, 3C(6th)a,b, 3D(8th)a
Missouri Course Level Expectations: IV-1A(B1)a,b,c, 1B(B1)b, 3B(B1)b, 3C(B1)a,c

Custom Designed Programs

(K - 12th grade)
We can develop a videoconference program on a topic of your choice. Previous requests have included: The Letter O, The Galapagos Islands and programs presented in Spanish. Contact the Outreach Coordinator at (314) 646-4754 or outreachrequests@stlzoo.org to discuss your needs.

First and Last Name _____

What Is the Cost Associated With the Programs?

Groups within the Zoo-Museum District of St. Louis City and County receive discounted pricing on some programs. Please note: all programs require full payment to be received before the program date.

30 minute programs

$80 per program (Zoo-Museum District)
$95 per program (outside Zoo-Museum District)

Note: A minimum of two 30-minute programs, back to back, are required to be scheduled. See class descriptions for which programs are available in a 30 minute format.

45 minute programs

$160 for the first program, $120 per program for any additional 45 minute programs scheduled for the same visit (Zoo-Museum District)
$200 for the first program, $150 per program for any additional 45 minute programs scheduled for the same visit (outside Zoo-Museum District)

Assembly programs

$450 (Zoo-Museum District)
$525 (outside Zoo-Museum District)

Booth programs

$160 for the first hour (Zoo-Museum District)
$200 for the first hour (outside Zoo-Museum District)

Each additional half hour will be $80.

Video conference programs

$160, plus connection costs if applicable (Zoo-Museum District and outside the district)

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Payment

For groups scheduling at least 8 weeks in advance, an invoice will be sent promptly. Full payment is due 30 days from invoice date. **If your payment is not received within 30 days, your program will be cancelled.** For groups scheduling with less than 8 weeks' notice, with a minimum of 4 weeks' notice, full credit card payment is required at the time of scheduling. Your reservation is not confirmed until complete payment is received. We are unable to schedule programs with less than four weeks' notice.

Cancellations/Refunds

Please notify the Education Department at (314) 646-4544 or the Outreach Coordinator at (314) 646-4754 *immediately* if you need to cancel. Another group may be able to take your place.

Refunds

Four Weeks Prior to Program:
A full refund will be issued minus a $5 cancellation fee if you notify the Education Department four weeks prior to your program. There is a $5 cancellation fee per program.

Two Weeks Prior to Program:
You are entitled to a 50% program fee refund if you notify the Education Department two - four weeks prior to your program date.

Less than Two Weeks Prior to Program:
There is no refund for groups that cancel with less than two weeks' notice.

***Please note**: In the event that your school and/or the Zoo is closed the day of your program due to weather, we will try to reschedule your program or issue a full refund.*

Transfers
Program transfers may be requested based on our ability to reschedule you. Transfers are determined by space availability. A $5 transfer fee will be charged per program for the first transfer date. A $10 transfer fee will be charged for additional transfers. Transfer fees must be paid with credit card at the time requested. We cannot accommodate same day or next day transfers.

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