STEM Development through Read-Aloud Partnership

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Abstract

Children imitate adult behavior of reading and handling books, and are naturally curious to explore, observe, predict, and understand the world around them. This study describes the effectiveness of a read-aloud STEM development program through cross-age partnership among students of various age groups (pre-K-college students) attending school on a university campus. Research based theories of read-aloud and developmental and cognitive psychology of children's early thinking and doing were used to train student volunteers desirous to become teachers. Multicultural story books aided the participants to embrace cultural diversity and relevance to teaching and learning. Science activities outside the classroom were seen as vehicles for the development of oral language, word awareness, and large-and small-motor coordination skills through counting, drawing, coloring and shape recognition. Following two pre-program questions, all adult readers received training and reading guides related to read-aloud techniques, style, and poise and child-centered constructive activities. A post-reading and activity analysis included focus group dialogues; a twelve-item reader survey; and reflective journal writing. The results of the read-aloud and STEM focused activities showed tangible and noteworthy benefits to readers and children. Informal read-aloud and science activities promoted growth in conceptual text comprehension and emergent literacy skills by the children and the age appropriate critical thinking and questioning skills for the various age groups. Cultural awareness and cross-age communication was

also noticed. The enthusiasm shown by participants has generated a continuation of this partnership.

Introduction

Children imitate adult behavior of reading and handling books, and are naturally curious to explore, observe, predict, and understand the world around them. One of the many ways to harness and develop children's curiosity of the natural world around them is through active interaction with their environment and to complement the same through reading aloud and sharing colorful visuals and text presented through children's books and stories. Preschool reading aloud to children or shared book reading has been linked to young children's emergent literacy skill development (Burgess, Lundgren, Lloyd, Planta, 2001; Dursma, Agustyn & Zuckerman, 2008), support oral language and word-sound awareness (citation) and a potent predictor of school readiness and later reading success (Duncan, 2011). In recent years reports from the National Research Council (2007, 2009) draws attention to the growing demands to educate more US students in science, technology, engineering, and mathematics (STEM) (Sanders, 2009). In particular, researchers and educators are called to respond to what and how to motivate and engage (Callagan & Oakes, 1992; Gelman & Brenneman, 2004; Palmquist & Crowley, 2007) young learners in STEM experiences through informal and socio-cultural activities prior to formal schooling (Berk, 2001; Rogoff, 1990; Yvgotsky, 1978).

Read-Aloud

Over a third of children in the U.S. enter school unprepared to learn. Children who start behind generally stay behind --they drop out, they turn off, their lives are at risk. *(Head Start, 1965, NCES, 2000; NICDC, 2003b; Shore, Shue & Lambert, 2010).* In

recent years greater attention has been given to the role of early childhood education programs in promoting the language and literacy skills of pre-school children. Researchers, educator, parents, and policy makers are increasingly accepting that a conscientious effort needs to be given to building quality pre-k/childcare programs across the nation (Green, Peterson & Lewis, 2006). Researchers find read-aloud as a very powerful way to increase children's vocabulary, listening comprehension, syntactic development, and word-recognition skills related to emergent literacy (Teale, 1986; Lane and Wright, 2007). Children who fall seriously behind in the growth of critical early reading skills, especially in the first three years of the elementary grades have fewer opportunities to practice reading and the lost practice makes it extremely challenging to ever acquire average levels of reading. While accumulative research reports talks of a much earlier start in pre-K for children to be read aloud to gain momentum and preparation for elementary school. Reading aloud by parents and caregivers help children develop positive associations with books and reading in later life.

Children who are read to develop a background knowledge of a range of topics and build a large vocabulary, which assists in later reading comprehension and development of reading strategies. Reading aloud to children helps to associate reading with pleasure and encourages them to seek opportunities to read on their own. Repeated readings of favorite stories allows children to gradually create an elaborate repertoire of reading concepts. By revisiting stories many times children focus on unique features of a story or text to reinforce understandings. In addition, re-readings enable children to read emergently (Green et al, 2006).

Multicultural Story Books

All children do need to have high quality children's books as part of their daily experience (Gregg & Sekeres, 2006). Story time can include a variety of reading materials, including "books that positively reflect children's identity, home language and culture" (International Reading Associations & NAEYC, 1998, p.9). In recent years there has been an increase in the publication of children's books that tell the stories of marginalized and diverse cultures through pictures and text (Cai, 2002; Fraizer, 1997; Richardson, 1995). Well-selected multicultural literature is often publicized as a tool that "helps children identify with their own culture, exposes children to other cultures, and opens the dialogue on issues regarding other diversity" (Colby & Lyon, 2004, p.24).
It is hoped that the selection of stories would allow listeners to culturally respond (Conrad, et. al. 2004) and reach the educational goals of read-aloud; i.e. to inform or explain; to arouse curiosity; to inspire (Trelease, 1995). Additionally, (Glazer and Seo, 2005; Landt, 2006) posit read-aloud facilitates children's awareness of cultural diversity and literacy, especially when both readers and listeners are from a diverse population.

STEM concepts and ideas

Research attests that young children can learn more math and science than we realize. America's Promise Alliance advice that we need to start early, even before Kindergarten—to nurture children's natural curiosity and go on to say that early math concepts such as knowledge of numbers, ordinality (sequencing), shapes etc; are powerful predictors of later learning. STEM researchers also state that early learning develops the children's brain synapses for cognitive abilities and social and emotional

skills such as focusing, persevering, and working well with others, the traits that all adults need to succeed in the workplace.

Good early learning curricula includes a wide range of math and science topics and books that are both instructive, constructive, and fun. Children should experience this content through enjoyable, play based activities appropriate for their age. The general benefits of play and activity for children's literacy development are well documented, showing that literacy enriched activity and play environment exposes children to rich print and the tangible three dimensional objects and things to work and play with (Roskos et. al, 2003).

Cross-Age Service Learning Readers

Several studies suggest when cross-age students are provided to interact through active participation in a thoughtfully organized experience that met actual community needs and was better coordinated in collaboration with the school and community within social and cultural perspectives were able to integrate academic curriculum beyond the classroom (Rogoff, 2003). When students think, talk, or write about their interactions and experiences they developed "a sense of caring for others". (The Alliance for Service-Learning in Education Reform in 1995; p. 1). Likewise, Fraizer (1997) notes that when college students do read-aloud activities with children both groups benefit from the service. Better and older readers can be taught concepts or strategies for cross-age read-aloud, and they, in turn, can teach others, especially the younger children. He also finds that when the stories emphasize multicultural themes, college students can better appreciate classroom discussions of cultural diversity, and children get the message that reading is fun, important, and can tell them something about themselves. A cross-age

partnership in reading is as natural as sibling bonding and occurs whenever a more accomplished student aids a lower achieving peer, or when an older student instructs a younger one (Rekrut, 1994). When adolescents read to young children, they not only see themselves mirrored within similarities, but also envision and experience them from the eyes of young children through textual dialogue and reading. Children, in turn, can benefit from the effects of the read-aloud sessions.

STEM

This STEM experiment integrated the Read-Aloud of multicultural story books among the diverse ethnic mix of pre-K children at the CDC by embracing, nurturing, and valuing the linguistic communities and the cultural diversity of students on campus *(*Billig & Eyler, 2003; Cone and Harris, 1996; Perini, 2002).

We read to children for all the same reasons you talk to children: to reassure, to entertain, to bond, to inform or explain, to arouse curiosity, to inspire….But in reading-aloud you also: condition the child's brain to associate reading with pleasure; create background knowledge; build vocabulary; and provide a reading role model *(*Beck and McKeown, 2001; Lane and Wright, 2007; Trelease, 1995; Yopp and Yopp, 2004*)*. The adult helps the child become the teller of the story. The technique for an adult to use to read to a child (Frazier, 1997; Richardson, 1995; Whitehurst, 1992; Yopp and Yopp, 2004) is the Dialogic Reading using the PEER Sequence: where the reader **prompts** the child to say something about the book; **evaluates** the child's response; **expands** the child's response by rephrasing and adding the information to it; and **repeats** the prompt to make sure the child has learned from the expansion (Frank, 2010; Whitehurst, 1992;

Yopp and Yopp, 2004). Most read-aloud styles also fall within the broader context of the Preview-Predict-Confirm (PPC) model as explained by Yopp and Yopp (2004).

STEM Read-Aloud Experiment

Cross-Age Reading Participants

The research was conducted from April to June 2013 at a Los Angeles, California university campus that included a Child Development Center (CDC). The 18 cross-age readers were students attending a Multiple Subjects/Bilingual Teacher Education Credential program of which 11 were International students from Central American enrolled in the same program. The 11 Central American students were bilingual Spanish speakers with their English proficiency at a level below to a native English speaker while the 7 regular Teacher Credential program students were also Spanish bilingual speakers fluent in English and of Hispanic ethnicity. All cross-age readers were voluntarily selected based on: (a) their desire to be acquainted with young children and reading; and (b) their aspirations of becoming an elementary school teacher and/or a lead reading teacher for grade level staff. The instructor provided the college students with a course assignment grade for participation in volunteer service and the practice of writing in reflective journals.

The CDC director, three teachers, and all 28 pre-K children (ages 2.9 - 5 years) attending the CDC program participated in the study. The children are identified as disadvantaged and low-income students who receive regular formal instruction and qualify for lunch and snack. Additionally, the CDC receives funding from the campus associated student center. The children attending the CDC have parents either working

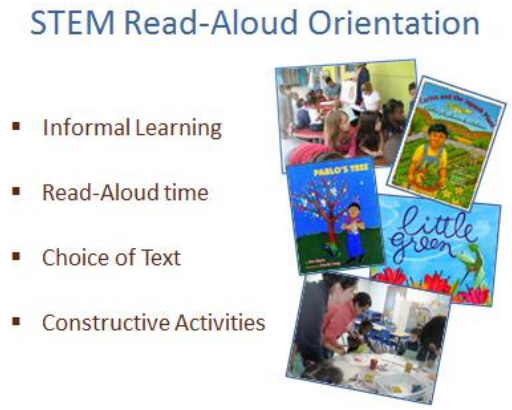
and/or attending academic programs on campus. All student-parents receive financial support to have their child enrolled at the center while low-income working parents are required to provide voluntary and flexible CDC school hour services. The children start school at 8:00AM with breakfast, periodic free paly time, formal instruction, and naptime. The last free paly time and snack extends from 1:45-5:00PM with some children leaving at 4:00PM. The read-aloud was scheduled from 2:00-4:00PM (Mon-Thurs). The CDC office staff and director helped coordinate all informal read-aloud sessions. The CDC pre-K children receive formal instruction in classrooms with adequate academic resources, a playground and ample toys for playtime, and have their own seasonal vegetable and flower garden. In all the children look very cheerful and happy with frequent parent participation and campus students services connected to their program study.

Responses to Two Pre-Training Questions

Prior to an orientation for students on how to read-aloud to children the researcher collected responses on two pre- orientation questions from all readers. *Question 1: What do you know about reading?* The responses indicated a broad experience about reading among the readers. Most readers were aware that read-aloud required good articulation and an emphasis on certain words to keep the listener interested and engaged. They also knew that read-aloud was a social and fun activity. One student had been exposed to read-aloud while another often read to young kids. *Question 2: Why do you want to volunteer your time to read to young children?* The responses indicated a focus on the social and civic engagement objective of readers. Some desired to interact and spend meaningful time reading to kids or to reduce boredom after school. Others wanted to experience how

kids learn and interact. Some students connected the positive aspects of reading to younger siblings and extended family members at home and just wanted to extend the same after school. One student volunteered time to read to young kids to gain experience to pursue a career in child psychology while another considered the interaction helpful to communicate with people of all ages. The following are some written responses from the read-aloud adult students:

> Reading is a process by which I inform, explain and teach about different issues or story ideas.
>
> It is a way for children to acquire new knowledge. It helps to relax. It takes us to the places we read about and imagine.
>
> It is a way of enriching ones vocabulary. It helps children's comprehension of text and it improves their knowledge.
>
> Children are like sponges that absorb everything. If we give them the best of ourselves the better their knowledge will be. When we read to children, we awaken their curiosity and imagination.



> At this stage, children can create their own stories using pictures and complete sentences for their stories. Reading helps to create an effective relationship with children. The child develops better communication skills.
>
> I have volunteered at this center before and I had a wonderful experience. Not only that, but I love interacting with children, that is why I am pursuing to become a teacher. Knowing that I can expose them to different types of literature, will make me feel that I am making a small difference in their lives. Reading aloud to children is really important, because they get an opportunity to express their emotions and ideas of the story, while they are learning at the same time. In other words, whenever they see someone that will read aloud a book, it will be one of the few times that you will see them sitting quietly.

> Seeing their faces full of enjoyment is what I love to see whenever I read to young children.
>
> Reading is one of the most valuable and rewarding things in life. Throughout this semester, I have learned different reading techniques and how it important it is to read to children. However, we all know that there is the huge possibility that many students are not exposed to literature outside the school environment, which increases the reading gap in today's society. Reading is one of the ways to teach phonics (phonemes, phonemic awareness etc...) and for students to learn higher levels of language. Reading gives a general knowledge about print which increases the ability for students to recognize and develop a sense of how letters are built into words and how words are built into sentences and so on. (circa. 2013)

The researcher and the bilingual program instructor conducted the orientation in English and Spanish for all 18 STEM cross-age readers (See Fig 1,p. 9) The orientation encompassed the following areas to make read aloud as effective as possible. These are: (a) the amount of read-aloud time, (b) the text for read-aloud activities, (c) the method of read-aloud, (d) constructive activities to augment STEM concepts and ideas, (e) the fit of the informal STEM read-aloud in the curriculum (Teale, 2003).

Read-Aloud Sessions

The read-aloud sessions were conducted outdoors during afternoon recess time. Paired volunteers (US and International Central American) readers took turns (reader and observer), and there would be on average 2-3 paired readers on any given day of the week reading, observing, writing the observations, and engaging in oral comprehension and activities with children. A read-aloud volunteer read for a total of six hours with each reading engagement not extending more than thirty to forty minutes. Working within the PEER and PPC model, approximate times were set for introducing the text and a preview-dialogue (10 minutes). A major segment of time was set for the actual reading

with attention to expression, characterization, and feedback-dialogue (20 minutes). The remaining time was then used for concluding dialogue, and confirmation of the story. Some days constructive activities were done to align the read-aloud stories with planting, watering individual potted seeds, caring for the CDC garden vegetable, flowers, drawing, cutting, coloring shapes and objects to cultivate the use of large and small motor skills and the use of the five senses and the sequencing of stories through pictures. In all, children were informally nurtured to develop a natural sense of their environment, the organic nature and growth of life, and the curricular concepts, ideas, language and numeracy.

The Choice of Text

Text selection focused on enabling the young listeners to make connection to their environment (citation), how organisms grow in nature (citations), real-life experiences of people (citations) and the awareness of similarities and differences among people (Perini, 2002). Glazier & Seo (2005) suggest using multicultural literature as a window to different cultures and a mirror reflecting that of the listener and the reader. For example, books that tell the stories of young people, their homes, food growing and eating, and activities provide young children with a view of the environment, a community, and how they fit within the community.

The researcher selected twenty-eight story books for this study. Some books describe **community, family and cultures**. For example, *Chrysanthemum*, by K Henkes told the story of the importance of one's name and meaning, the alphabets required to spell the name, and how to be proud of one's name through the experiences of the animal world. *A Day's Work*, by E. Bunting told the story of a migrant

grandfather as a day worker seeking employment with the support of his grandson's English speaking ability. *Planting a Rainbow,* by L. Ehlert narrates the bonding between mother and daughter and the planting of beautiful flowers and watch them grow and fill their garden. *Pablo's Tree*, by P. Mora narrates the special love and bonding between a grandfather and child where the former plants a tree when he meets his grandson and every year the grandfather decorates the tree with an ornament to commemorate his grandson's birthday. Other stories deal with home **growing food and the wildlife that coexists.** For example, *Carlos and the Squash Plant*, written by J.R. Stevens in English and Spanish describes family efforts to cultivate a squash farm but also inculcate good hygiene for good health to their child. *The Snail's Spell*, by J. Ryder takes a magical look at a snail as seen by a curious and imaginative young boy and his imaginary life as a snail. *Pepita Talks Twice*, by O.D. Lachtman, the English and Spanish paragraphs illustrates how a little girl learned just how important it is to be able to speak two languages when she must save the family dog and communicate with older neighbors.

All the selected stories covered one or more purposes such as increasing individual character, respect, acknowledging family, community, growing food, existence of nature and living organisms (Brasell, 2006; Campbell and Wittenberg, 1980). A detailed listing of the stories are listed in the appendix.

The Method of Read-Aloud

Children who are often read and immersed in rich talk about books and the various activities-grow, while children without the *windows of opportunity* (Campbell et al, 2002, p.9) to books and dialogue fail to thrive and are challenged beyond school (Dickson, McCabe, & Essex, 2006; Neuman & Celano, 2006; www.ReadyNation.org , 2005). Reading scholars and specialists (America Reads Program, 2007; Cunningham, et.al, 2000; Teale, 2003) suggests that teachers, parents, and care-givers involve children in both immediate and non-immediate talk. Immediate talk concentrates on answering factual details and labeling pictures. Non-immediate talk extends beyond the text. It includes word meanings, making predictions and inferences, and relating the text to personal experiences. It is important that individual children have numerous opportunities to engage in non-immediate talk before and during read-aloud sessions.

The cross-age read-aloud volunteers received two hours training by the researcher on how to read and engage young children in oral comprehension skills. The readers' skills were further augmented through hands-on observations of how the three CDC teachers read to the children. Additionally, read-aloud guides were created for all readers. One guide provided a clear understanding of their role during the read-aloud time with the children. It briefly explained that we read aloud to children because (a) reading is fun, it tells stories of people, events and things, (b) reading builds background knowledge through concepts, words, ideas, events and images, (c) reading makes one familiar with print, (d) reading makes children familiar that words are made up of sounds which they learn to repeat and scribe, (e) reading helps children to chant, sing, clap, count, repeat, imitate others, sequence pictures, draw and predict.

A second guide helped volunteers to (a) manage time and plan well, (b) select stories that children show interest and experience (c) before reading select and preview book for with vivid pictures, strong story line, humor and prediction, (d) use expression and intonation while reading, (e) be responsive to facial expression and body language and if the book is not working, don't be afraid to stop, without being punitive, and (f) complement reading with a fun activity. Besides the introductory training, and the two guides, each reader was provided with a checklist to help them plan as well as reflect on their read-aloud experiences. While the "fun" aspect and extra-curricular style (outdoors and recess-time activity) was projected, it was continually emphasized that the readers would receive course credit and they had a task to perform.

Constructed Activities

Young children are avid STEM investigators, curious to explore, and eager to invent (NAEP, 2002). The volunteers were taught of math and science play-based activities that are both instructive and fun such as basic concepts of geometry and numeracy and the use of the five senses to explore and experiment in their environment. Reading about food, nature, plants, animals and families let children get interested to care for the CDC garden vegetable, flowers and the growth of a plant from an individual seed. Volunteers were trained to help children cut shapes, name, count, and tell stories through picture sequencing to develop the psychomotor skills of the children.

Figure 3 below illustrates a small window to the conceptual knowledge generated from the read-aloud. Picture one shows an apple tree similar to a student's imagination to *Pablo's Tree* read to them. Children cut and paste their choice of a house either with materials they found in the playground or colorful geometric shapes cut and labeled. The

child's drawing with just random scribbles was explained by the young drawer as the playground.

The Fit of the Read-Aloud in the Curriculum

Finally, the fit of the read-aloud program in the schools' reading curriculum is very important to reach the goals that read-aloud propounds. The CDC center reading curriculum is progressive in nature. The reading curriculum for children of 2.9 - 3.9 ages emphasizes on reading for enjoyment and listening skills by getting children familiar with text structures and story comprehension. Visuals, drawings, puppets, and animation are used to convey the themes represented in the books read. Teachers and students select books for reading. As part of emergent literacy children are provided the opportunity to retell, draw and act upon story segments to convey oral and visual comprehension. Children caption their drawings by engaging in invented spellings for phonemic awareness. Math and science concepts are also embedded within the reading curriculum. Music, singing and psychomotor skills focus on a comprehensive curriculum for child development. The reading curriculum for 3.9 - 5.0 ages is embedded within a wider contextual framework on a daily basis. Reading selections are thematic encompassing math, science, and language arts. Music, art, and physical activity for psychomotor development are also included within a given theme. Students engage in more systematic writing and drawing by captioning their work and using story frames to retell events. The teacher generally rewrites alongside student's writing to familiarize students with word sounds and structure.

The read aloud STEM program goals were to provide an extension of the CDC formal academic curricular instruction in an informal setting. The two guides developed for this study addressed the theory of read aloud and the structure of how to read to children. The readers used the PEER model to help listeners to preview a text, author and illustrations leading to predictions and confirmations. The listening and oral comprehension was demonstrated through the retell of stories and drawings. The readers replicated the poise, style and disposition of read aloud within an enjoyable environment.

Post-Reading Analysis

Group Discussions-CDC-School-Teachers

After the study ended in June 2013, the researcher at focus group discussions, solicited the views of the CDC teachers about the read-aloud program and their observations. The following are the views expressed by the 3 teachers CDC who observed and also monitored the children during read-aloud and recess.

Teacher 1

The kids like the stories being read/ Julian spoke about snails in his back-yard…children like to water their little seedlings. Only one Pre-K student speaks Spanish but was reluctant to do so with the Central American students. He later changed after the story Pepita Speaks Twice, was read where the little girl saved her dog from being struck by a van by warning the pet in Spanish.

Teacher 2

Children enjoy the older students read to them. Most children didn't mind giving up their playtime to read-aloud sessions/having two readers with 3-4 children was very helpful to have the children engaged.

Teacher 3

Having their drawings posted on the walkway outside the classroom made children happy especially when their parents stopped to notice their work. Some children have brought books from home to be read in class/Children have been eager to know what vegetables and flowers grow in the CDC garden plot.

All three teachers' responses indicate a positive outcome. This shows children enjoyed being read to by read-aloud volunteers. The teachers asked for a continuation and expansion of the program. The researcher has continued the program with next semester teacher credential program students during fall 2013. It is hoped that the read-aloud will renew college participation in the future.

Read-Aloud Volunteer Analysis

The Read-aloud volunteers collectively agreed to having fun with the children during reading and activity time. A journal response stated: *It was ideal to have one of us read while the other observed and helped to guide the activities. We each learned from our peers how to focus on children interests and not repeat the same errors.*

An in-depth journal account of the PPER model states the following:

PEER Technique: Day 1 - Student 1 & 2

> Today was introductory day. We were introduced to a group of 5-6 students in which we were informed that they are the youngest students at the center. At first the children were a bit shy when Jose introduced himself and informed them why we were there for. As soon as they found

out we were going to read to them, they seemed intrigued. When Jose started asking them questions they were really shy and they did not want to answer. However, little by little they got more comfortable and I was simply surprised as to how much they know at such a young age. Both Jose and I were amazed of their knowledge. Even though they were shy throughout those minutes, they seemed really focused and engaged. I can't wait to continue to read to them. **Day 3 - Student 1 & 2**

Today I was ready to read **Planting a Rainbow**, however, they (CDC) asked us to help students plant their seeds for their garden. It was a really warm day and the students seemed to be eager. Along with the rest of my peers we divided the tasks. One directed the students, the other gave them some soil, while the rest of us helped the students plant their seeds. I helped several students to plant their sunflower seeds. One of the students from the first group knew exactly what to do. He knew how to dig a hole and cover the seed after putting it in. They all seemed worried because the dirt seemed a bit dry, so they wanted to water it. As we helped the students plant their seeds, we had them hypnotize how big their plants will grow. At such a young age students can have in-depth conversations and that is what I learned today. Overall, it was a great experience.

Volunteers' Responses to a 12-Item Survey

At the end of the reading assignments, all 18 volunteers responded to STEM Read-Aloud Partnership (highlighted in segments below)**.** The questionnaire was distributed on the last day of read-aloud in June 2013 before the end of the academic year. Readers responded with a choice of "True", "False" and "Not Sure". This survey provides a range of information for the evaluation of the partners who volunteered in read-aloud cross-age service.

Table 1

Volunteering in STEM Read-Aloud

#	Survey Questions	True	False	Not Sure
1	I participated in my school's volunteer reading activities as part of extra credit for the course.	18		

2	I volunteered because I just like to read.	18		
3	I volunteered because through reading, I can improve my own interaction with young children.	18		

Volunteering in the STEM Read-Aloud

Volunteering statements asked for personal affirmations in the desire to volunteer. Here all 18 readers responded in the “true” category for items 1 and 3.

Reading Style and Poise

#	Survey Questions	True	False	Not Sure
4	I was comfortable in introducing the book and read with expression.	15		3
5	I was comfortable in communicating with young children.	18		

Reading Skills

Reading Skills related to the reader’s comfort in reading to young children. Fifteen responded “True” and three were “Not Sure” for item 4, while all 18 readers were comfortable in communicating with young children.

Training Needs

#	Survey Questions	True	False	Not Sure
6	I am well aware of the academic and social needs of young children.	18		
7	I was supported adequately to be an efficient read-aloud partner.	18		
8	The reading comprehension techniques taught to me will assist me	18		

	to read to other children.			

Training Needs

These sets of questions were directed towards the read-aloud training schema, and all eighteen readers responded in the "True" category for all three questions. They expressed an awareness of the young children's needs, and were content with the support and training provided for this program. They also accepted that this training will help them in future endeavors, to read to other children.

Constructed Activities

#	Survey Questions	True	False	Not Sure
9	I was comfortable teaching science and math concepts during read-aloud	18		
10	I had fun helping children plant a seed, water the garden, and name the parts of a plant	18		
11	I was comfortable to have children draw, color, cut, and glue ideas from the read-aloud stories	18		
12	I was comfortable when children asked questions about plants, and animals, and their family	17		1

Constructed Activities

This last segment allowed readers to respond to the augmented STEM activities with the read-aloud stories. All eighteen volunteers had fun sharing, exploring, observing and being curious about nature and the environment with the children. Only one volunteer was "not sure" to response to the "why, I wonder" or more probing questions that at times can puzzle students and teachers.

The accompanied samples of student work and read-aloud selections show the

enjoyment and purpose of the student readers with Pre-K the children have had in spring 2013. They created a cheerful environment for the listeners and definitely found pleasure in the read-aloud sessions. All nineteen readers fully endorsed the fun and optimism they experienced.

Researcher Observations on Five Readers

In addition, the researcher discreetly observed many of the readers (in order to distracting the children or the reader), and made notes during the reading session. These notes show that most readers followed the guidelines they were given. The second and fifth reader followed many of the 9 items listed, while reader one covered the least number of cues. It is desired that readers will follow more of these cues in the future. Being a voluntary and "fun" activity places this burden on the reader. The researcher concentrated on the learning experience and the experience of an enjoyable read-aloud session.

Reading Style and Poise: Observations of 5 Readers

	READERS				
	1	**2**	**3**	**4**	**5**
Introductory Actions					
1. Introduced the book; asked questions about the cover.	X	X			X
2. Allowed time to study the pictures in the book.		X	X		
Observations during Reading					
1. Read with expression.	X	X	X	X	
2. Encouraged reactions and predictions.		X	X	X	X
3. Responded to children's expressions.					X
4. Used varying lengths of time through the reading.		X		X	
End-of-Story Actions					
1. Pointed out parts the reader and the children liked/disliked.					X
2. Requested reactions and personal experiences of the children.	X			X	X
3. Encouraged discussion/retelling the story.		X	X		

Number of Cues Followed	**3**	**6**	**4**	**4**	**5**

Final Thoughts

As a cross-age read-aloud partnership in service learning on a university campus, the results are promising. Although it was a limited amount of actual engagement time among students; the service provided tangible and noteworthy benefits to readers and the children. Readers communicated their excitement about a particular story to the children; and, also communicated the value of reading beyond the classroom. Children reinforced these ideas through their drawings and oral retelling of the story. Also reading was seen and valued as a fun thing to do outside class and during recess. During the reading sessions the children made predictions of the stories being read by looking at the cover, illustrations, and title of a book. The children enjoyed making predictions at various intervals of the reading-session. The PPC model was very effective in this experiment. Readers were also comfortable with the training they received; and the tools used to plan and reflect on their tasks.

This experience can be adapted across different content areas. As a first attempt, the cultural diversity of the listeners made selecting cultural themes a good place to begin. Now the listeners are interested in read-aloud sessions. And the curriculum reading objectives include new vocabulary, factual content, relevance to children, etc. Imagine using "*geography*" books as a separate exercise. Gregg and Sekeres (2006) show how geography learning can help develop children's vocabulary and get exposure to the wonders of the world.

They gave children opportunities to encounter words through exploration activities, read-aloud sessions, and in expository texts. Geography, social studies, science, nutrition, mathematics, etc. are all content areas that can be used. Brassell (2006) finds read-aloud with nonfiction trade books and storybooks to improve students' comprehension, vocabulary and interest in science.

The initial commencement and outcomes of the study promises the transfer of read-aloud training into new themes of learning. Adding science, social-study, nutrition, and geography stories to coexist with multicultural stories is the future challenge. Only one theme will be added each semester; and a rotation of themes to the multicultural stories is planned. This experiment was successful in many areas. Service learning gets kudos from the participating readers and schoolteachers; readers become motivated storytellers and future teachers; listeners expand comprehension, learn content and develop new vocabulary; and all within an extra-curricular setting. The researcher concludes in the words of a great story teller for children and adults readers: *"The more that you read, the more things you will know. The more you learn, the more places you'll go."* ***Dr. Seuss****, "I Can Read With My Eyes Shut!"*

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Appendix

Read-Aloud Book Selection

Title	Author	Name	Selection/Date
Little Green	Keith Baker		
Tops and Bottoms	Janet Stevens		
Mud	May Lyn Ray		
Lily's Garden	Deborah Kogan Ray		
The Little Mouse, the Red Ripe Strawberry and the Big Hungry Bear	Audrey Wood		
Bright Beetle	Rick Chrustowski		
Chave's Memories	Maria Isabel Delgado		
Me and Mr. Mah	Andrea Spalding and Janet Wilson		
Chrysanthemum	Kevin Henkes		
The Snail's Spell	Joanne Ryder		
The Carrot Seed	Ruth Krauss		
Carlos and the Squash Plant	Jan Romero Stevens		
Planting a Rainbow 2 copies	Lois Ehlert		
Earthworm	Andrienne Soutter-Perrot		
Pablo's Tree	Pat Mora		
Over in the Meadow	Michael Evans		
The Wonderful Happens	Cynthia Rylant		
Flower Garden	Eve Bunting		
Off We Go!	Jane Yolen		
Alejandro's Gift	Richard E. Albert		
Mother Earth	Nancy Luenn		
How Groundhog' Garden Grew	Lynne Cherry		
Some Bugs	Angela DiTerlizzi		
Diary of a Worm	Doreen Cronin		
Eating the Alphabet	Lois Ehlert		
Growing Vegetable Soup	Lois Ehlert		

Título	Autor	Nombre	Fecha de selección
Yo crecí aquí	Anne Crausaz		
¿Quién pasó por aquí?	Martha Duhne		

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