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# Collaborating with Theatre, Nature, and STEM: A Multigenerational Family Event

Anni K. Reinking

*Southern Illinois University Edwardsville*, [anreink@siue.edu](mailto:anreink@siue.edu)


Michael J. Vetere III

*Illinois State University*, [mjveter@ilstu.edu](mailto:mjveter@ilstu.edu)

Jay C. Percell

*Illinois State University*, [jpercel@ilstu.edu](mailto:jpercel@ilstu.edu)

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## **Collaborating with Theatre, Nature, and STEM: A Multigenerational Family Event**

Anni K. Reinking  
*Southern Illinois University Edwardsville*

Michael J. Vetere III  
*Illinois State University*

Jay C. Percell  
*Illinois State University*

### **Abstract**

Family engagement can take many different formats, including community events. In this study, the researchers designed an event to encourage multigenerational family involvement using STEM (science, technology, engineering, and mathematics) and DAT (developmentally appropriate theater). The study was also designed in an outside environment to encourage interactions with nature and outdoor physical activity. The researchers found that families enjoyed the event and understood the academic and social benefits of nature and arts based education. Overall, this study continues a conversation focused on the importance of engaging families in nature and art based activities.

## **Collaborating with Theatre, Nature, and STEM: A Multigenerational Family Event**

Community outreach and family engagement are essential to student learning, both academically and socially (Smith, Wohlstetter, Kuzin, & De Pedro, 2011). Through community outreach, strong partnerships are built between community members and families that ultimately encourage social and academic experiences (Henderson & Mapp, 2002; Iruka & Carver, 2006). Furthermore, when students and families feel part of the community a sense of belonging and ownership develop (as cited in Guetzkow, 2002). In 2013, Former First Lady Laura Bush wrote, “love of nature” is steadily diminishing in young families. As a grandparent, she reflected on the loss of nature in the lives of children and families. She stated, “Nature and the natural world are like a foreign language to many of today’s kids... around the nation” (para. 4). She went on to state that, “an elementary school child now spends less time outdoors than any generation in human history” (para. 4). Community agencies can play a role in outdoor-learning opportunities through the development and implementation of community engagement events with community partnerships. Minimal attention has been given to the role of community members’ and organizations’ influence in educational research, therefore this research study provides insight and research-based knowledge to the field of community engagement and academic outcomes.

Community engagement events can take many forms, ranging from permanent activities such as libraries and museums to one-time events such as traveling exhibits to theatre events. The family and community engagement activity for this research project focused on a multigenerational

activity integrating science, technology, engineering, and mathematics (STEM) related activities, developmentally appropriate theatre (DAT), and visual arts opportunities for families in a public setting. Families and members of the community attended a one-day event at an outside community nature center organized by the nature center and a local puppet theatre company. One member of the puppet company is a local university faculty member. Attendees had the opportunity to engage in arts and STEM learning activities on the outdoor grounds of the nature center while exploring the prairie. The central event that merged the activities was a puppet show of *The Three Little Pigs* presented by the local puppet theatre company. Two additional education faculty members participated in the research process. Attendees ranged from newborns to senior citizens and included various family relations including child, parent, siblings, aunt/uncle, to grandparent. The research on multigenerational family engagement, outdoor activities, and the incorporation of the arts and STEM will be discussed.

### **Family Engagement**

When researchers focus on family engagement it is from the viewpoint of developing concrete school and home relationships, which are based on six factors. These six factors include validating family participation, consistent two-way communication, allowing and encouraging families to participate in events, building a bridge between home and school in relation to learned knowledge, creating home environments that value learning, and creating ongoing systems to promote family engagement activity (Epstein, 2001). However, the school and home relationship is just one type of family engagement. There are also family engagement opportunities occurring in the community which are not directly associated with the school, but support the learning that occurs during the school day nonetheless. These events will be referred to as community engagement events or simply community events. Community events and/or partnerships with local organizations can provide structures and events for families outside of the school environment. When families are engaged in students' learning outside of the classroom there is a stronger connection to education and learning (Mapp & Kuttner, 2013).

One approach community organizations can utilize, for the purpose of engaging families, is to design events that create a way for multigenerational family members (parents and grandparents) to relive their youth and encourage discovery in the lives of children. These types of events are also known as multigenerational events (Dauenhauer, Steitz, & Cochran, 2016). Engaging in multigenerational family activities is essential to gaining multiple perspectives on a topic. Researchers acknowledge that in the United States of America, 57 million people live in multigenerational families (Fry & Passel, 2014). Since there is a large amount of multigenerational families interacting and living together in the United States, there are research studies depicting the benefits. Some of the benefits include economic stability and support through hardships, which can benefit the family unit and children (Keene & Batson, 2010).

Although millions of people live in multigenerational households with family members around the United States, most people in western cultures, including the United States, have a nuclear and individualistic mentality when discussing families and households (Harkness, Super, & Tijen, 2000). A nuclear family is a family that consists of the couple and dependent children. This mentality is changing, however, as economic difficulties arise and more people from other parts of the world immigrate to the United States. Between 1970 and 2012, per U.S. Census data (2016), there were 40% of families living in nuclear family households. This percentage declined in 2013 to just 19%. The decline in nuclear households does not necessarily mean that there is an increase in multigenerational households; however, the U.S. Census Bureau did report that by 2012, 23.6%

young adults lived in multigenerational households. This percentage was up from 18.7% in 2007 (Fry & Passel, 2014). The increase in multigenerational households is important to consider when discussing the benefits of cross-generational interactions and the incorporation of new ideas with older ideas. However, for this study, the researchers focused on the interactions between multigenerations rather than only multigenerational households, in order to be inclusive of different family arrangements.

Through events that encourage multigenerational interactions, participants can discuss, engage, and reflect on the material. They are also able to recognize the importance of not only learning about others and their perspectives but also learning about one's own self (McGowan, 1997). When older individuals are included in community events they can, "contribute their own knowledge and expertise, and the feeling they can make such a contribution is beneficial in terms of reducing their isolation" (Dantzer, Keogh, Sloan, & Szekely, 2012, p. 30). Older adults take on a meaningful role in their community, which is transitively beneficial.

### **Outdoor Time**

Former First Lady Bush's statement at the beginning of this article is partially supported by a growing body of research that suggests children today are spending less time outdoors than in past generations (Larson, Green, & Cordell, 2011). While some studies support this statement, other researchers point to the fact that there have not been enough systematic, large geographic scaled studies (Larson, Green, & Cordell, 2011). The research that supports the idea that children are spending less time outdoors are small scale studies, but are generally supported by reflections and nostalgic recollections of the past (Clements, 2004; Larson, Green, & Cordell, 2011). Regardless of the viewpoint, the benefits for children being outside are important, including the physical activity experienced when outside (Raudsepp & Pall, 2006).

By providing community engagement events in environments that promote nature, outdoor exploration, and discovery, individuals are able to explore the world around them in a more purposeful and creative manner (Cain & Jolliff, 1998). Outdoor play also offers "children opportunities to explore their community; enjoy sensory experiences with dirt, water, sand, and mud; find or create their own places for play; collect objects and develop hobbies; and increase their liking for physical activity" (Clements, 2004, p. 68). Therefore, outdoor community engagement events are crucial to the developing child.

### **DAT and STEM**

The combination of DAT and educational opportunities regarding STEM is one avenue for community organizations to encourage academic and social learning and bonding (Agofure, 2016; Braund, 2015). DAT is theatre that is developmentally appropriate for all ages and is based in the field of early childhood education where developmentally appropriate practice is often the foundation of policy. In one well-known early learning environment, Wolf Trap Institute's regional chapter in Georgia, DAT is described as "strategies to infuse classrooms with a joyous approach to literary elements like character, setting, problem solution, and beginning, middle, and end. Teaching artists use storytelling, music, movement and puppetry to unlock students' natural curiosity" (Alliance Theater, 2016, para. 2). DAT addresses the cognitive ability, social-emotional level, and attention of the audience members watching the production. Audience members who are presented with DAT are more likely to expand their literary capacities, increase their imagination, value the artistic process and work, and understand the world around them (College Board, 2012). In the case of this study, a puppet show rendition of *The Three Little Pigs* served as

the DAT experience, which became the cornerstone of all other enrichment opportunities for the entire event.

Along with the use of DAT, the integration of STEM into the curriculum was a foundational component of this study. Reliance upon STEM as an educational mentality allowed the researchers to design interdisciplinary activities that encouraged problem solving, communication, and mathematical reasoning. The National Academics of Sciences, Engineering, Medicine's Framework for K–12 Science Education (2012) articulates the role of engineering as a mechanism by which students can learn meaningful scientific concepts. Furthermore, it has long been recognized that experiential, hands-on education provides motivation and inspiration for learning new material, by providing real-world meaning to the otherwise abstract knowledge (Mataric, Koenig, & Feil-Seifer, 2007). By offering an experiential, hands-on activity, this project hoped to foster the development of 21st Century skills such as team building and collaborative problem solving.

After understanding the benefits of multigenerational interactions and the importance of academic and social growth goals at community events, the researchers were able to develop a research study. The purpose of the research study was to determine how the role of DAT affects multigenerational family interactions while engaging with nature and STEM activities. The research study began with guiding questions that focused on what the volunteers and researchers observed throughout the event and how multi-generations responded to the art and STEM activities during the event.

### **Theoretical Framework**

The theoretical framework used in this research study was Bronfenbrenner's (1979) ecological systems theory; a theory developed to explain how everything in a child and the children's environment affects how a child grows and develops (Oswalt, 2015). In this theory, there are five systems, the microsystem, the mesosystem, the exosystem, the macrosystem, and the chronosystem. For this study, we will focus on the first four systems. The microsystem "is the direct environment we have in our lives...your family, friends, classmates..." (Sincero, 2016, para. 3). In his theory, Bronfenbrenner believes that how a child acts, or their temperament, will affect how they are treated in return. The mesosystem involves the relationship between all of the microsystem individuals in a child's life. For example, the experience with an interactive multigenerational family event will influence the child's school experience because they are all interacting in the child's life. These intertwined interactions will also help in the development of the child's overall growth.

The other two systems are the exosystem and the macrosystem. The exosystem includes people and places that do not directly interact with the child, but are in the child's environment affecting the child. For example, a child's exosystem may include workers at a museum, extended family members, or neighborhood and community members (Oswalt, 2015). Finally, the macrosystem is the largest of the systems. Although it is the most remote, it still has a great influence in the child's life. For example, cultural traditions or family values would be considered part of the macrosystem, as well as national freedoms (Oswalt, 2015). Overall, in this study the researchers used Bronfenbrenner's (1979) theory during coding and data analysis.

### **Methods**

The research project was designed by university faculty members in collaboration with staff and volunteers at a local nature center in central Illinois who collaborated with a local puppet

theatre company. This section will discuss the partnership, the research design, participants, activities, and the performance during the community engagement event.

## **Partnership**

The initial partnership between the nature center and the puppet theatre company occurred through a mutual conversation about art, nature, and community involvement. Both parties were passionate about sharing their interests with members of the rural Illinois community. One member of the theatre company was also a faculty member at a local university. There he garnered the talents of two additional educators to work collaboratively on this research project to explore how DAT, STEM, and the arts can work in tandem during a community engagement event focusing on multigenerational learning.

The puppet theatre company's responsibilities included performing a puppet show of *The Three Little Pigs*, as well as developing and implementing arts and STEM activities throughout the grounds of the nature center. The nature center supplied materials, advertisements, and community contributions. The faculty member who initially began the partnership for the event supplied volunteers from the university. All researchers facilitated the data collection, coding, and completing the research. The results of the study helped inform the nature center and the puppet theatre company's involvement with multigenerational audience members and ways in which community engagement activities can support the education of rural areas. A result of the initial conversation, the event and research study was designed.

## **Design and Participants**

The researchers used the qualitative research design of grounded theory to collect and analyze data, which is an investigative research method (Glaser & Strauss, 1967; Glesne, 1999). Grounded theory is utilized when theories are used to explain and predict, which was the process used by the researchers during the data analysis portion of this study (Glaser & Strauss, 1967). Additionally, it is used with research focused on a group of individuals who have a shared experience or interaction (Creswell, 2012). This process was used generally to inductively identify the themes through the open coding process. However, as will be evident in the findings and discussion, Bronfenbrenner's ecological theory was used to interpret the themes.

The participants in the study were gathered through convenience sampling. Convenience sampling is a type of nonprobability sampling where researchers "simply collects data from those people or other relevant elements to which he or she has most convenient access" (Blackstone, 2017, para. 15). In the case of this study, the participants came to the event and chose to participate in STEM and/or nature activities and to watch a puppet show of *The Three Little Pigs* at a local nature center. The participant sample was convenient because they were simply the individuals who showed up to the event.

The participants were families, which included parents, grandparents, aunts, uncles, brothers, and sisters, and university volunteers who volunteered their time to work at various activities during the event. The family participants heard about the event from the nature center's website and Facebook page. The university students discovered the event through some of their courses at a state university in Illinois. In total, there were 75 participants that filled out the survey before leaving the event. A majority of those were family members that had attended. All the university volunteers filled out a survey, which totaled 18.

Demographic information for the participants was not collected on the surveys or during the event. The university volunteers were recruited from a university theatre department through the

distribution of flyers. Therefore, most of the university volunteers were in their late teens or early twenties. The participants who attended the event (families) were recruited as described above.

### **Activities**

The activities at the event consisted of STEM, visual arts, and dramatic play stations. A total of eight stations were established. These stations included Construction Zone, Snouts, Muzzles, Masks, Finger Puppets, Pop-up Puppets, coloring pages and brain games, Photo Booth, Play stage, and Pet-a-pig.

The station titled *Construction Zone* was a place where families were asked to work together to build a house using upcycled materials and common crafting tools along with items from nature. Volunteers who wore construction hats, fluorescent vests, and pretended to play the role of construction workers met participants. They were asked to roll a dice to see if they were going to have the natural disaster of a tornado, earthquake, or hurricane. Once the natural disaster was selected, they entered an area with many different supplies. Some of the supplies were cardboard boxes, tape, glue, scissors, and coloring materials. The participants (i.e. families) were instructed to work together to build a house that could withstand the natural disaster assigned to their family, similar to the events that the pigs encountered in the puppet show. Once the house was built, there were simulations of each of the natural disasters. The completed house was placed on or in the simulation of the natural disaster to see if it could withstand the wind force, water, or shaking. After the simulation, the families were asked to graph, on a large community graph, whether their house was strong enough to withstand the natural disaster or if it was destroyed.

Various puppet-making stations were also available. This included body puppets with the Snouts, Muzzles, and Masks station, hand puppets with the Finger Puppets station of pigs and wolves, and a rod puppet station. At the rod puppet station, participants drew animals on rods, or in this case sticks. The partakers were instructed to create their habitat that their animal resided. The rod puppet could then “pop” in and out of its habitat through the manipulation of the puppet. These activities utilized materials that were either upcycled or recycled.

Other activities included coloring pictures and brain games where participants could independently or collaboratively color and solve thought-provoking questions. A photo booth with props was also available for individuals to pose and take pictures for social media. A Play stage was setup for children to use their imagination and take on different characters. The stage was set with three, very large, cardboard houses that represented the houses from the puppet show. Props and costumes were also available for kids to dress-up and become different characters. The characters were chosen with the purpose of extending the story through participants’ imaginations. The costumes were more than pigs and wolf costumes. The pieces ranged from crowns, capes, vests, fedoras and various hats, and scarves. Lastly, real piglets were available for kids to meet and interact. A local farmer owned the piglets and agreed to bring it to the event. Attendees could ask questions and interrelate the events of the story with actual happenings.

### **Performance**

Halfway through the event, which lasted a total of three hours, the *Pigs on the Prairie* puppet show was performed by the local puppet company. At that time, all the other activities paused so all families in attendance could watch the performance.

The puppet show was about 25 minutes long. It included a variety of characters, based on *The Three Little Pigs* story. The story of *The Three Little Pigs* is a fable/fairy tale with different variations. This version included three pigs who graduate school and are ready to go out and live

on their own. Their parents leave them at the beginning as they retire to the retirement village for flora and fauna. They leave their childhood home and begin to make choices about what type of house they are going to build while encountering a thrifty wolf with many disguises. Ultimately, the three pigs and the wolf come together with their varying talents to open a restaurant.

Additionally, the puppet show included original music and voices for each character along with scene changes. After the puppet show, the activities reopened and families could engage with each other in a variety of ways. Furthermore, while traveling through the activities the families were provided a “roadmap.” The roadmap included every activity. Therefore, at every activity the families could get a stamp to check off that activity, which was a way to also engage all members of the family.

### **Data Collection**

There were two main methods of data collection. One was observation and one was survey data. The researchers present at the event collected the observation data. The observation data included interactions, conversations, and engagement levels of all involved parties. Additionally, a photographer at the event took pictures of families and volunteers interacting throughout the event. The pictures were also used as observation data. The survey data collected was from the university volunteers and the adult participants. The surveys for family members included questions such as, “What did you or your child enjoy most about today’s event?” and “What benefits do you feel theatre and arts provide you or your family?” The surveys for volunteers included questions such as, “Did you observe social interaction among youth and families? If so, please give examples” and “Did you observe any child or children dislike today’s event? Explain.” Therefore, between the observations, pictures, and surveys the researchers could triangulate their data based upon the guiding research questions.

After the event, the families were asked to turn in their surveys before leaving. Many adult family members did. The volunteers were then asked to fill out a survey and help clean up the nature center area. After all the surveys were collected the researchers gathered the information, typed all the responses into an excel sheet, and began to work together to find common themes.

There were limitations to this study. First, not every participant was able to fill out a survey or chose to fill out a survey to provide feedback and information about the event. Some may argue that only the individuals who enjoyed the event felt compelled and invested enough to fill out a survey, resulting in feedback that is more positive. Second, not every interaction and event was observed. The event took place outside in a wide-open area. Researchers were unable to document all interactions; therefore, there was an overwhelming reliance on the survey data.

### **Data Analysis**

After collecting the data, the information was coded using the grounded theory method of open coding to axial coding. The researchers went through the process of open coding together. Every piece of the data was reviewed simultaneously by the researchers who were then able to discuss the data, take notes, and collaboratively find the themes. Axial coding was the next step in the process, which the researchers again did collaboratively. The researchers could identify relationships between and among the codes, which will be discussed in the findings. The researchers found themes that were evident in the observations, including the photographs, and the surveys from both the volunteers and adult participants. One theme focused on the overall goal of the event—providing a free multigenerational family experience for the community. Other themes



related to the educational value of the event and the level of engagement across all age groups. Each theme will be discussed further in relation to the guiding research questions, which were:

1. How do multigenerations interact with each other and with the activities during the theatrical event?
2. How do families (guests) describe benefits of theatrical and arts education?
3. How is STEM learning (science, technology, engineering, and mathematics) evident among the participants during the learning activities? (i.e. observations/photographs/conversations during building, designing, or the final product in various learning activities).

Additionally, the theoretical framework focused on Bronfenbrenner's (1979) ecological system's theory. In this section, the findings associated with Bronfenbrenner's (1979) ecological systems will be discussed because in the data analysis process the researchers focused not only on the guiding research questions, but grounded the analysis in Bronfenbrenner's framework.

Utilizing Bronfenbrenner's framework was a way for the three researchers to solidify the analysis process during the analysis period. Four of the five levels of his theory were addressed during the research project and in conversations with the researchers during the data analysis process. The four systems examined were microsystem, mesosystem, exosystem, and macrosystem. Each system will be discussed in regards to the analysis process, which also includes some findings. However, the themes that were derived from the data analysis process will be described in the findings section.

### **Microsystem**

The microsystem is the child's immediate environment. In the case of this research study, most of the participants were parents or caregivers of the children they brought to the event. This reiterates Bronfenbrenner's idea that when these microsystem relationships are nurtured, positive relationships will flourish and "the better the child will be able to grow" (Oswalt, 2015). As evident in the observations and surveys, attendees were interacting in a positive manner with each other in their family and community groups. The positive experiences that emerged resulted in social interactions that allowed young participants the opportunity to "break down boundaries between imagination and reality" (Li, Hestenes, & Wang, 2016). These dramatic play experiences are a direct benefit for the individual.

In addition, this community engagement activity provided a platform for participants to develop and expand cognitively and verbally. Multigenerational participants engaged in STEM, arts, and drama in this event identified social interactions and education as a key benefit of this event. Although the researchers do not know the cognitive or social impact of the event, research suggests that these activities surrounding play allowed children to develop social interactions and increase cognitive development (Ahmad, Ch, Batool, Sittar, & Malik, 2016; de Valk, Bekker, & Eggen, 2015; Saracho & Spodek, 1998).

### **Mesosystem**

The mesosystem is the next level in Bronfenbrenner's theory. As a reminder, this level "describes how all the different parts of a child's microsystem work together for the sake of the child" (Oswalt, 2015, para. 6). The premise for the event was to have families or caregivers bring children to have a fun and interaction afternoon in nature. This interaction of the child's home life and an extension of school (i.e. the educational community event) displays the positive interconnectedness in the lives of the participants. The families made a choice to attend the event

displaying an active role in the child's educational experiences. Families were observed interacting in all the activity areas. They were engaged in conversations, problem solving techniques, and interacting with items most families do not have at home. When parents engage in their child's learning along with their family and community, the child can benefit from their involvement and engagement (Stefanski, Valli, & Jacobson, 2016).

### **Exosystem**

The exosystem is the level that includes the "other people and places that the child may not interact with often, but that still have a large affect" (Oswalt, 2015, para. 8). This system is evident in the overall choice of driving to the nature center for the educational event and interacting with people in the community in a positive way. Most of the families reported they had not been to the nature center before or did not come very often. When youth are exposed to new environments, such as nature centers or art museums, they "experience improvements in their knowledge of and ability to think critically about art, display stronger historical empathy, develop higher tolerance, and are more likely to visit such cultural institutions" (Greene, Kisida, & Bowen, 2014, p. 12). Therefore, exposing children and families to the nature center, along with all the interactions between staff and volunteers, resulted in reports of positive experiences for all involved parties, including families.

### **Macrosystem**

The final level we are focused on is the macrosystem, "which is the largest and most remote set of people and things to a child but which still has a great influence over the child" (Oswalt, 2015, para. 10). One example of the macrosystem includes the idea of cultural values. As evident from the dedication to attend the nature event, the families in attendance displayed a portion of their cultural values. When the arts are evident in a community engagement event, participants are empowered by the event and engagement with the arts (Ersing, 2009). By attending this event, families valued time together, learning, nature and the sense of empowerment. This was evident from the observed conversations and surveys received. For example, participant 12 remarked, "It was a fun event for my entire family to enjoy together." The cultural value of experiencing time together through nature, art, learning, and family time all have a positive effect on the child and family system as positive interactions were noted repeatedly in the observers' notes. Community engaged cultural arts events "provide an alternative outlet for creative expression and healthy self-exploration, which contribute to the building of core developmental assets (e.g., self-esteem, positive identity, empathy) (Ersing, 2009, p. 38). Participants could either continue or begin to develop performance etiquette, a love for the arts, and positive multigenerational interactions. Observers' noted repeatedly that audience attention to the performance and appropriate reactions to the events, within the story, was joyful. They also noted positive engaging experiences between children, parents, friends, and grandparents through side conversations, positive facial expressions, and genuine touch. It was further evidenced by multiple participants who remarked in their survey their enjoyment of the puppet show and the arts activities.

## **Findings**

Throughout the data analysis process, three main themes emerged: the multigenerational family event, engagement with enrichment activities, and educational opportunities to interact with STEM and nature. Each of these themes will be discussed in relation to the findings from the data analysis.

## Multigenerational Family Event

The first theme focused on the idea that the event was multigenerational or relating to several generations of family members (multigenerational, n.d.). In the planning process, the researchers discussed families coming, but the multigenerational aspect became evident as the participants began to arrive for the day. As the participants arrived grandparents, aunts, uncles, and older siblings were bringing younger children to the event. When asked on the survey “Why did you choose to attend today’s event?” respondents commented ranged from, “Baby-sitting Grandma” (Participant #1) to “I have a grandson and thought it would be a great event” (Participant #11) and “I have a 3-year-old and an 8-month-old” (Participant #17). Upon further reflection, the researchers found this developed multigenerational theme of the event to be a positive aspect to the overall experience for people of all ages. Furthermore, the event, while close to a larger city, was still a twenty-minute or more drive for most families. The idea of investing the time to bring out younger children, on the part of older adults, was something that intrigued the researchers.

The themes of multigenerational family interactions and engagement with nature and STEM/art activities became apparent when answering the first guiding research question. The first research question asked the volunteers to observe social interactions between and among family members during the day’s events. On the surveys, volunteers reported a high level of engagement between and among family members. Specifically, in the *Construction Zone* station volunteers reported a high level of questioning and conversations between adult family members and the children. Volunteers commented that, “Parents asked kids what they thought of the show and what parts they liked” (Vol. #6) and “Parents talking with other parents at the same station” (Vol. #4). While there were some volunteers who saw children unengaged, the engagement level of others outweighed the few instances of disengagement. Furthermore, the volunteers and the photographer captured many moments in the Play stage area with children and family members dressing up or acting out *The Three Little Pigs*.

## Engagement with Enrichment Activities

The theme of engagement was discovered when investigating research questions two and three. Engagement, for this study, referred to a state of being where participants were committed to an action, experience, or interaction (engaged, n.d.). As evidenced by the survey data and researcher observations, families overwhelmingly expressed their engagement and enjoyment of both the theatrical puppet show performance and the educational STEM and nature enrichment activities. The majority of respondents (12 out of 20) cited the puppet show and/or the educational activities as a major benefit their child gained from this event.

The puppet show, an adapted version of *The Three Little Pigs*, was frequently commented on positively in the surveys. Participant #3 stated, “I loved the puppet show, it was an awesome story with a twist.” Participant #18 stated that puppetry is a less common activity and Participant #16 specifically attributed the puppet show to fostering students’ sense of creativity and imagination.

Additionally, the participants responded to the survey and researchers observed that the performance was engaging for all ages. Family members commented on the fact that everyone was watching and were thoroughly entertained. The volunteers and researchers noted this also. Volunteer #2 stated, “I saw many children laughing and smiling during both the event and puppet show” coupled with Volunteer #7 who answered if and how they observed social interaction among youth and families, “Yes: talking, pointing, asking questions.”

Although most of the engagement was positive, one volunteer noticed a child who did not engage in the event by stating, “Hard to say - couldn’t tell if a child was in distaste or just in need

of a nap” (Volunteer #8). In addition, parents and children were not on their phones or other electronic devices during the puppet show, but rather were truly engaged in the show and with each other.

The event was designed to be engaging, and there were plenty of activities for families to take part in and interact with elements of puppetry, STEM, and nature, as well as sufficient time allotted to do so. The high level of overall engagement was reflected in the survey data from family participants, volunteers, and researcher observations. The activities were engaging in their own way. While some of the activities required participants to sit and concentrate on a task, such as coloring a picture, most of the activities had the participants up and moving around to increase their engagement level with the materials and with each other.

### **Educational Opportunities to Interact with STEM and Nature**

Finally, the educational opportunities were centrally important to this event. All stakeholders wanted to make sure that the event was fun for families, but also that everyone learned something in the process. At the *Construction Zone*, families could work together to build a house that could sustain a hurricane, tornado, or flood. This not only engaged families, but also encouraged them to work together and investigate different engineering techniques. One participant (Participant #12) indicated that their child was very “focused and tactful” in his construction.

Additionally, while families interacted with the live piglets, facts were also distributed verbally and in written form for participants to learn about pigs. Many people commented on the fact that they heard there would be live piglets and wanted to come see them in person. They appreciated the opportunity to see and interact with live animals and many felt that it was “fun and educational.”

Families reported that their children loved having the chance to pretend or dramatize *The Three Little Pigs* on the Play stage. Participants and volunteers both noted the value of imagination and socio-emotional development. One participant stated that the Play stage “allowed their child a time for self-expression and he can be anything/anyone he wanted to be” (Participant #3). While a volunteer commented, “They get to use their imagination, express their creativity, and enter a new world” (Volunteer #10). Overall, participants recognized the educational value of the day’s community engagement event.

### **Discussion**

The overall event, from the planning process through the data analysis, was one of learning and discovery. The role of DAT highlighted multigenerational family interactions while simultaneously connecting with nature, the arts, and STEM activities. The themes that emerged were positive reactions to a multigenerational community event that engaged families and provided educational opportunities to participate with STEM and nature. Based upon these findings, combining DAT with STEM-based arts-infused activities affords high quality experiences for several stakeholders, especially multigenerational families and community members, educators, policymakers, and individuals focused on expanding the use of nature, arts, and STEM as a means for educational engagement.

The overall benefits of the study highlighted partnerships with local agencies, fostering a sense of purpose among multigenerational families, and emphasizing the development of STEM through theatre and the arts. First, the collaboration and partnership with local agencies promoting the arts and nature in the lives of families and students can be instrumental to academic and social development for all ages. Supporting this idea is the fundamental notion that engaging

multigenerational individuals in interactive activities benefits not only the children who are able to have role models, but also the aging adults who are able to engage with young children in a positive way. Additionally, as described earlier, older adults engaging in multigenerational events has been shown to create a sense of purpose in the lives of aging individuals (Chen, 2016). Finally, as STEM and arts education continue to be at the forefront of educational conversations, collaborating with local agencies to provide free events for all families on the economic spectrum, from rich to poor, will only continue to help build a love for learning in the community and show support for the local and national school agenda.

Furthermore, this study also provides ideas for future research projects. First, research involving interactions among multigenerational families interacting in community-based arts events could add to the available scholarship. Second, as researchers in the field of education continue to study the benefits of STEM infused curriculum, incorporating STEM activities into community events could add to the large amount of STEM research being disseminated. Third, families benefit from STEM infused community activities. Families are able to learn what STEM is and how to incorporate it at home. However, if incorporation at home is not a possibility, these types of events provide a way for families to engage in STEM infused activities that create connections and learning about specific and intertwined concepts.

Ideally, these future studies may lead to more arts-centered and/or DAT community activities. This is an extremely important outlet as arts programs are being cut from school budgets and buildings around the United States, due to funding. Community organizations and individuals need to continue to develop a love for the arts in children and families by incorporating arts-infused activities into family and community events.

Developing partnerships with area businesses or agencies that can help provide educational, multigenerational, and fun experiences for families with a focus on STEM, nature and arts education can be instrumental to community building and ownership. While this study cannot be generalized, the results from this study support other findings that state partnerships and multigenerational community involvement create positive communities of lifelong learners.

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