Developing Children’s Education Materials for the SFO Museum at the San Francisco International Airport

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Developing Children’s Education Materials for the SFO Museum at the San Francisco International Airport

**Keywords:** Museum Studies, Airport Museums, Museum Education, SFO Museum, Early Childhood Education

by
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Capstone project submitted in partial fulfillment of the requirements for the Degree of Master of Arts in Museum Studies

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ABSTRACT

This capstone project developed as a result of my Summer 2016 museum studies internship with the SFO Museum at the San Francisco International Airport. This unique museum is located within the airport terminals and is the only airport museum in the United States accredited by the American Alliance of Museums. Though the SFO Museum conducts education programs, it does not have an education department, instead relying on the curatorial staff to execute the museum education tours. The Museum’s tours cover children’s education materials for second and third grade students in the San Francisco Bay Area. I propose creating pre-visit materials in partnership with local educators to share in advance of a field trip. These materials will create a deeper understanding of the material and engage young visitors in more thoughtful dialogue once at the Museum.
# TABLE OF CONTENTS

Chapter One: Introduction  
Chapter Two: Literature Review  
Chapter Three: Project Proposal  
Chapter Four: Action Plan  
Chapter Five: Conclusion  
Appendices  
  Appendix A: Annotated Bibliography  
  Appendix B: Project Stakeholders  
  Appendix C: Current and Proposed Education Program Evaluation Form  
  Appendix D: A List of Airport Museums  
References
CHAPTER 1 – INTRODUCTION

The SFO Museum at the San Francisco International Airport was first conceived in 1978 because of the passage of California’s Proposition 13. The passage of this policy reduced property taxes in California by an average of 57% creating a ripple effect that took away essential government funding to public programs like museums and libraries (Callan, 2011). The airport commissioners and then-mayor decided that as San Francisco City and County’s largest revenue generator, the airport would be the perfect place to both have art programs and cover most its costs. The SFO Museum received its AAM accreditation in 1999 and remains to my knowledge the only museum in an airport with this status (Callan, 2011). Many passengers don’t realize there is a team of museum professionals working behind the scenes in the United States’ only American Alliance of Museums (AAM) accredited museum within an airport.

The Museum operates differently from most traditional museums. It is entirely funded by the SFO Airport, so it does not require a development department, and additional departments such as information technology, custodial, and building maintenance all fall under the purview of the SFO Airport. The one traditional internal museum department the Museum has managed to do without and the Airport could not cover is the education department. Currently, the curatorial staff runs any education programs. The staff structure of the SFO Museum is shown below in Figure 1.
Figure 1: Structure of the SFO Museum organization including permanent, as-needed, and volunteer staff.
To maintain its AAM accreditation, the Museum lays out its mission to “… provide a broad range of exhibitions and educational programs, collectively represent the diversity of human achievement, enrich the public experience, and differentiate SFO from other airports” and six goals including its goal to “Provide and continue to improve the educational and children’s components of SFO Museum” (see Appendix B for the full list) (SFO Museum Annual Report, 2016). As of this writing, there are no other airport museums with AAM accreditation and, to my knowledge, only the Steven F. Udvar-Hazy Center, a Smithsonian National Air and Space Museum annex conducts education tours in its facility, located in a building separate from the Washington Dulles International Airport terminals. Creating a larger, simple, scalable model for airport museum education programs could ease the development process.

When first observing and then participating in the SFO Museum’s education program for second and third grade students in the San Francisco Bay Area, I was interested in the subjects and activities covered and how different the activities seemed from my perspective as an adult compared to my youthful experiences attending museum field trips. By first starting with a guided lecture by the Curator III and then a session of play and experimentation by building paper airplanes with the Curator IV, the Museum had already established a basis for its education program. What I noticed was the lack of attention and participation during the lecture. I wanted to find ways to improve the situation. I interviewed first-grade teacher Wes Lane to get a teacher’s perspective and he brought to my attention the concept of pre-visit materials and how helpful they can be to educators (Lane, 2016). He emphasized that in his experience not all museums produce well thought-out materials or give guidance on what teachers should be doing to prepare students for a field trip to a museum. By creating brand new pre-visit materials for the
SFO Museum in collaboration with local educators, we can bridge the gap between well-meaning, but perhaps over-ambitious, museum educators with the practical needs of overworked teachers for children’s education materials. With this capstone project, I seek to create fun, colorful, clearly laid out pre-visit materials to share with second and third grade teachers who visit the SFO Museum for its education program. The materials will be created in partnership with local educators and the SFO Museum curatorial staff. To determine what types of materials educators most wish to see, a series of focus groups will be conducted at the Museum with the SFOM staff. These materials will address the ongoing planning needs for teachers who do not have time to research the various specifics of the SFO Museum education program topics on their own and will provide the SFOM with the knowledge that the students participating already have some information on the topics, which allows for deeper discussion once at the Museum (Gennaro, 1981).

Many museums charge for their education program services while the SFO Museum education program is completely free to attend. This financial barrier breaks down a large hurdle that some schools cannot afford to take on, allowing children of all backgrounds to participate. Additionally, as the SFO Museum gains recognition in its field, other airport museums can seek out their advice and possibly model their own education programs after SFOM.

Research for this capstone led me to a bounty of information on children’s education. There is an immeasurable amount of philosophies, strategies, and methods of implementation on the best way to educate children that I lay out in Chapter 2: Literature Review. The more modern techniques involve STEM education (Science, Technology, Engineering, and Mathematics) combined with the idea that children learn best when they are allowed to play and be children.
Chapter 3 lays out the project plan to combine the SFO Museum’s current education program with suggestions for additional material. The Museum has a large play component with its “Fly It Activity!” where the students fold paper airplanes and then compete for fastest, furthest, and highest plane flown within the Museum (China Clipper Ed Prog 08-2016 [PDF], 2016, p. 3). By creating these materials with the STEM and play activities in mind, my vision is that teachers will be able to conduct their own aviation-related experiments within the comfortable environment of their own classrooms and with more individual attention than the SFO Museum staff could provide during their short trip. The project’s eight-month long action plan in Chapter 4 suggests a plan for creating the materials with respect to the time commitments of the SFO Museum staff and potentially long approval times for any materials coming out of SFO. Additional materials in the appendices include the annotated bibliography, stakeholders, the unique organizational chart of the SFO Museum, and additional airport museums throughout the United States.
CHAPTER 2 – LITERATURE REVIEW

“…for in wonder lie the beginnings of knowledge.”

– Albert Bigelow Paine (Paine, p. 555)

As museums and airports continue to integrate and airports establish collections and archives to document their history, the need to provide educational programming has developed. Despite the growth of both fields, surprisingly little research exists about airport museums, and even less so about educational programming around the subject. This capstone proposes investigating different ways of integrating science, technology, engineering, and mathematics—otherwise known as STEM education; humanities; and the California Department of Education Content Standards into the children’s education program of the SFO Museum at the San Francisco International Airport. To set the stage, this literature review considers the topics of: the history of museum education; education for children in museums and a comparison of methodologies; and airport museums and their development, with a focus on the SFO Museum.

Children’s Education in a Museum Setting

In 1835, when the British scientist James Smithson’s last remaining relative died, his estate was bequeathed to the United States, a place he had never visited. His will stated, “I then bequeath the whole of my property … to the United States of America, to found at Washington, under the name of the Smithsonian Institution, an Establishment for the increase & diffusion of knowledge among men” (Smithson, p. 3-4). During this time in England, child labor was an essential part of the Industrial Revolution with limited child labor laws such as the Poulett Thomson’s Bill of 1836 that allowed a twelve-hour work day for children over the age of twelve
and that “there is no class of children better fed, better clad, better lodged, or more healthy [sic], than those of manufacturers,” as stated by Mr. Baines, of Leeds (Kydd, 1857, p. 94).

In America, it wasn’t until 1904 that the National Child Labor Committee was developed to endorse the welfare of children and remove the desire for child labor. Views on the role of children within the Smithsonian Institution evolved soon after Smithson’s initial donation. As stated by Paine in the *Smithsonian Institution Annual Report for 1901*, the Children’s Room was developed with the support of Mr. Samuel P. Langley, the Secretary of the Smithsonian from 1887 to 1906. As the self-appointed honorary curator, Secretary Langley developed an exhibition space that he imagined he would have enjoyed when he was a child, creating a dedicated space exclusively for children. Paine notes that Langley changed the typical exhibit design by bringing displays down to the eye-level of children, removed the complicated Latin names of bird specimens in favor of their common names, and ensured the space provided a warm and inviting atmosphere. Secretary Langley did not seek praise for his then revolutionary idea that children had a place in a museum and that a museum could provide that place. Paine proposes that:

Perhaps the child who has passed an hour or two in this room full of interest and pleasure does not know or care to whom his happiness and his thanks are due. It does not matter. If he only cares for the thing itself, cares enough to come again, and perhaps bring his parents, that they too may look and learn with young eyes (and if he is the child most of us have known best, he will do this), the Secretary and Honorary Curator will be amply repaid. (p. 560)

The Smithsonian now runs the Smithsonian Early Enrichment Center, a separate organization under the Smithsonian Institution umbrella that opened in 1988 which provides and promotes children’s education within the Smithsonian and nationally. This shift from exploiting children as cheap manual labor to viewing them as humans capable of wonder and exploration was a natural progression through the turn of the century. Though there are those who feel young
children have no place next to fragile and priceless artifacts, there are now 349 museum members with the Association of Children’s Museums throughout the world (Find a Children’s Museum, 2015), and increasing amounts of families, educators, and museum professionals are welcoming the benefits of including children’s programming in their education development.

Museums provide an object-rich approach to learning using their vast collection repository to provide an endless stream of stories for education. As they moved away from the outdated model of “antiquarian societies, open only to their members, many admitted by secret vote” (Schwarzer, 2006, p.8) to non-profit institutions beholden to public scrutiny and a higher moral calling to educate the public, museums saw that building on this cultural capital was highly beneficial.

In a study conducted at the Dalí Museum in St. Petersburg, Florida of 176 children enrolled in the Dalí Museum Junior Docent Program, Kaufman, Rinehardt, Hine, et al, hypothesized that regular access and participation with art would have a therapeutic effect on the children’s self-concept (2014). Children participating in a non-judgmental learning environment were allowed to take control and develop their own tour of the art galleries with the assistance of an adult docent. Data gathered from pre- and post-testing showed that after only one week in the program the children responded positively to their self-concept. For instance, “When responding to the item ‘I am a bad person,’ children with a more positive outlook about their self-concept might think of themselves as less bad after completion of the junior docent program” (p. 123). Results were similar across self-concepts such as social, academic, and work categories. This study was one of many that showed the numerous positive outcomes of involving children in museum education programming. Several other studies conducted in New Zealand, as referenced
by Terreni (2015), showed that newly graduated teachers found beneficial aspects from a museum education program where visual arts education is already a respected component of children’s education. The studies showed that workshops helped by creating a sense of community within the group, teachers were more comfortable communicating, and previous biases towards museums were removed (p. 728-729).

In addition to being good for self-esteem and team building, children’s education in museums has the added benefit of building new audiences. American museums record an average of 850 million visitors every year, more than double that of major sporting events and amusement parks combined (American Alliance of Museums), but the National Endowment for the Arts reports a five percent dip in attendance from 2002 – 2012 (Cannell, 2015). As museums make the effort to appeal to a broader range of demographics, one tactic has been to literally get them while they are young. At the Gilcrease Museum in Tulsa, Oklahoma, a program called Museums Babies is currently underway. Created in partnership with the Tulsa Community College child development program, Museum Babies caters specifically to infants, toddlers, and their families. The Gilcrease Museum’s goal was specifically to, “Engage families when their children were infants and toddlers, with the hope that the families would continue to visit as their children grew older and promote lifelong involvement with the museum and learning for the entire family” (Goble, 2015, p. 42). Though the program has not existed long enough to establish an infant-to-museum-donor timeline, initial post-program questionnaires show a positive response to the collaboration and parents’ desire to interact with others in their community and have structured fun with their children (p. 44). As museums work to develop a community of
learning and to ensure a greater lifetime commitment to one’s local museum, creating a sense of ownership and familiarity with the museum becomes important.

**Museum Education for Children and a Comparison of Methodologies**

There is no shortage of experts who will claim one method of education is better than another; that schools should focus exclusively on the arts or scientific inquiry, or use as much technology as possible while other classes barely see a battery-operated calculator. President Obama caused quite the stir among academic art historians during a 2014 speech to employees of the General Electric plant in Wisconsin when he said that:

> A lot of young people no longer see the trades and skilled manufacturing as a viable career, but I promise you, folks can make a lot more potentially with skilled manufacturing or the trades than they might with an art history degree. Nothing wrong with art history degree. I love art history. I don’t want to get a bunch of emails from everybody. I’m just saying, you can make a really good living and have a great career without getting a four-year college education, as long as you get the skills and training that you need. (Epstein, 2014)

True to his prophecy, President Obama received his fair share of grief from that comment and eventually apologized. Nonetheless, the President’s longstanding support of science and technology skills in children’s education is well documented in various policy plans and was specifically mentioned during his 2013 State of the Union Address (White House, 2013). Instead of delving into an us versus them mentality, it is clear from the research that what educators should be focusing on is a well-rounded education. Barbara Bowman, one-time President of the National Association for the Education of Young Children (NAEYC), said, “Research has pointed with increasing clarity to the tie between how we care for and educate young children and their subsequent development and learning” (Copple, 2001, p. 167). Currently, one of the most popular schools of thought is to integrate more science, technology, engineering, and math, more commonly known as STEM education, into school programs. There are also movements to
integrate more play and tactile learning naturally into the school day, which can involve STEM education as well as other fields of study, such as art or social studies. Some of the largest obstacles educators face is an absence of support from their administrators, helicopter parents, or lack of time to implement complicated new curriculums due to the looming presence of state testing (Stevens and King, 1976, Soto, 2000, and Daugherty, 2013).

As science education becomes more widespread, teachers are tasked with keeping pace with the evolving curriculum of STEM education. Learning the basic vocabulary of STEM education is the first step in what has been described by some as “the largest reform movement in PK-12 education over the last decade” (Daugherty, 2013, p. 10). The importance of STEM education lies in its ability to teach critical thinking and problem solving skills. In their study (2015), Ceylan and Ozdilek describe STEM as an interdisciplinary bridge, resulting in the “knowledge and understanding of scientific and mathematical concepts and processes that are needed for individual decision making, participating in civil and cultural affairs, and for economic productivity for all students” (p. 224). While the importance of STEM education cannot be underemphasized, there are also invisible barriers that some feel prevents all but the privileged few from exploring such fields of study. Examples of personal barriers include those who believe that if students are not going into that particular field of study there is no point in learning anything about that field (Caldwell, 2014) or those who think that a student’s age prevents the ability to think critically about an issue (Adams and Parlakian, 2016).

The second topic of museum education about which there is a great deal of research is the concept of tactile play as a method of learning. Jean Piaget and Lev Vygotsky’s research on how children learn has contributed to one of the most widely used models for educational theories
The Early Learning Model (ELM), recognizes that exploration and curiosity are key drivers in how children make meaning; that children learn best by exploration, which is also a key component in STEM education. Piaget describes how most think of play as child’s work and an innate behavior for children (Piaget [1951] 1962). Adams (2016) describes the fourteen-month-old Kim-Le playing with a clean water bottle filled with colorful craft supplies: Though she can barely talk, Kim-Le is conducting an experiment while she plays with the bottle. Will she get the shiny sticks out if she shakes the bottle harder? How can she solve the riddle of pulling out the soft puff balls when they do not easily fall out? Her teacher watches as she investigates these riddles, and as a result, Kim-Le has just conducted her first trial and error science experiment while playing. Kim-Le learned much more from wondering and conducting her own experiment than if someone had simply said what the result would be or solved her problems for her (Adams, 2016). Creating these instances of play allows children to explore and expand their imaginations.

In addition to a playful and exploratory experience, it has been shown that providing multiple instances for children to engage tactiley in a print-rich environment of books, writing materials, labels, signs, or lists is highly beneficial (Axelrod, Hall and McNair, 2015). By incorporating these small instances with which children can interact, it normalizes words as an everyday occurrence and encourages more children to learn to read at an early age. One teacher in the article referred to their early readers as “paper and pencil kids” and was able to conclude that their early reading ability was due to the large amount of print-rich materials at home (Axelrod, et al, 2015). One way to incorporate a print-rich environment with play is to incorporate everyday items that have large amounts of text such as a box of cereal, a newspaper
or magazine, or shampoo bottles that will make them reminiscent of their home environments (Van Hoorn, et al, 2006).

The Association of Children’s Museums wrote, “In an increasingly complex world, children’s museums provide a place where all children can learn through play” (Association of Children’s Museums 2014). This theory can clearly be applied beyond children’s museums. As we grant children with the ability to learn and explore, they are not only growing up into more well-rounded adults, but avid and attentive museum goers.

**History of Airport Museums, with a Focus on the SFO Museum**

Scant literature exists on airport museums, and even less so on education programs within those museums. There are approximately ten museums located within airports throughout the United States, but only one of them is accredited by the American Alliance of Museums: The SFO Museum at the San Francisco International Airport. When Marjorie Schwarzer’s article on airport museums, *Now Boarding: Airport Museums and the Global Audience*, was published in early 2001 the airline industry was very different. The terrorist attacks of September 11 had not yet transformed the security of air travel. She describes the early days of the airport as, “A spectacle: a recreational place to go to watch aircraft take off and land. An outing to an airport was so special that people often dressed in their Sunday best when they ventured there” (p. 62). While we now know that lifestyle is no longer the case, airports are constantly attracting more visitors. The San Francisco Airport Commission reported just over 48 million passengers during its 2014 fiscal year making SFO the 7th busiest airport in North America and 21st busiest in the world (2015).
The SFO Museum, located at the Louis A. Turpen Aviation Museum and Library in the International Terminal and various exhibition cases throughout the San Francisco International Airport, is the first and only AAM accredited museum located within an airport. It was originally conceived in 1978 after the passage of California Proposition 13. This policy caused a negative ripple effect by removing government funding of public programs (Callan, 2011). With the reduction in funding to services like museums and libraries, the mayor and airport commissioners decided to work together and have San Francisco City and County’s largest revenue generator develop an arts program. Mark Hall-Patton of the Cannon Aviation Museum at McCarran Airport in Las Vegas wrote that his institution was borne of a similar mindset, “Effort to merge existing professional museum expertise with a source for funding and visitation” (as cited in Kramer, 2013). The exhibits would soften the stressful and sterile qualities that air travel had become. In 1999, the SFO Museum received its AAM accreditation and to this day remains the only museum within a working airport with that distinction (Callan, 2011).

As of this writing, the SFO Museum runs educational programs for a variety of groups with several customizable options. The Museum currently provide educational materials for its China Clipper education program created for grade two and three students (Education Program, n.d.). The SFO Museum conducts these educational programs without the support of an education department. The tours are conducted by the Aviation Curator and the Collections Manager/Librarian. Kramer describes the consensus around airport museums in that they were created to cater to passengers rather than as educational tools. The SFO Museum conducts these tours as part of its AAM accreditation requirements. Similar education programs were not found for comparable museums or education programs were specifically not included in the planning of
the museum (Kramer, 2013). According to Megan Callan, one particular way the SFO Museum caters to passengers is by being very selective about the types of exhibits they produce. One will never find an exhibit about plane crashes, natural disasters, or highly controversial subjects within the SFO terminals (2011).

**The Impact of Pre-visit Materials**

Starting as early as 1967, educators realized the impact that providing advanced preparation before a field trip could have on the student experience (Gennaro, 1981, p. 275). As cited in Gennaro, a study done by Delaney (1967) felt that the impact of receiving materials in advance only affected students deemed to be “below average and average seventh-graders” (p. 275) and Ausubel (1976) stated “superior students do not benefit from advance organizers and this phenomenon is probably explained by their natural proclivity to learn meaningfully and by their generally superior conceptual framework” (p. 275). How students were deemed to be of “below average” or “superior” intellect wasn’t included in Gennaro’s summary. Studies conducted by Gennaro and Anderson and Lucas (1997) stem from this original hypothesis, however they don’t separate students based on perceived intelligence. Gennaro observed a group of students in a Minnesota junior high school; students were separated into five control and five experimental groups with the experimental groups receiving additional lectures, work sheets, experiments, and concepts for the week prior to a science museum field trip where the same topics would then be covered. Anderson and Lucas conducted a similar experiment across the world in Queensland, Australia with students of varying age groups (1997). They were also divided into two groups with the experimental group getting additional pre-visit materials and museum orientation information, while the control group did not. The two studies mentioned
here, as well as additional studies referenced in the articles, concluded that students perform better on post visit evaluations when first given some context for what they are about to experience. The materials supplied to educators included a range of resources like a simple layout of the museum exhibits, a description of the topics covered, behavior rules to abide by, and instructions for hands-on experiments.

In modern day classrooms, teachers often divide their days between acting as an educator, social worker, housekeeper, parent, cheerleader, and more. To say their time is limited would be an understatement. Having the SFO Museum develop and create pre-visit materials that cover a broad range of topics including behavioral expectations in a museum and airport, types of activities to explore, suggested age-appropriate books to read, or a short introduction to topics that will be covered on the Museum’s field trip would be extremely helpful to all parties.

We know that children learn best when they are offered a combination of education methods. These chances to play and explore with everyday objects and the highly current history of aviation integrates the best of STEM education and the liberal arts. As airport museums showcase the best of their collections and educational opportunities, I can only predict that more airport museums will begin to seek AAM accreditation. Airport Museums can gain recognition within the museum community, receive additional support in terms of funding, volunteers, or collection acquisitions, and establish cultural capital for their city. The challenges for airport museums will then be establishing secure ways for large groups of visitors to spend extended amounts of time within the museum area when a 24-hour airport is operating around them and building excellent education practices for exhibits that may not be permanent or exhibit areas that are located behind security checkpoints. There is a wealth of information around children’s
education and museum education. The greatest challenge for the SFO Museum will be to integrate the program with its education goals and policies when they do not have staff dedicated exclusively to education. The SFO Museum has a special collection that allow visitors to see beyond their small bubble of home and dream of the wonders of the world. Though Ted Lind of the Newark Museum was speaking of art collections at the time, his quote is highly relevant here: “…the collections of art museums present a wider view of the world for young learners--seeing other times and places that are beyond their own neighborhoods and limited environments” (T. Lind, February 10, 2014 as quoted in Shafer, p. 136).
CHAPTER 3 – PROJECT PROPOSAL

The SFO Museum, located at the San Francisco International Airport (SFO), is the first and only museum of its kind having earned its American Alliance of Museum accreditation in 1999. The SFO Museum regularly collaborates locally and shares its exhibits or collections with institutions such as the de Young Museum, the California Academy of Sciences, and the Exploratorium. The 20 exhibition spaces located throughout the airport--pre- and post-security--showcasing the 40 exhibitions produced every year are open 24 hours a day, 365 days a year and completely free of charge to the public or those with boarding passes for exhibits behind security. The only exhibits not open year-round are those within the San Francisco Airport Commission Aviation Library and Louis A. Turpen Aviation Museum, located before security in International Terminal A, as it does require staffing and therefore maintains regular opening hours. The Aviation Museum and Library have one permanent exhibit on the history of the China Clipper as well as several exhibition spaces that are used for temporary exhibits. Temporary exhibits are also on display throughout SFO on a broad range of topics including but not limited to Super Bowl memorabilia, postmodern interior design, Ouija boards, pinball machines, and even vintage rock ‘n’ roll posters. See Figure 2 for an exhibition location layout and explore the exhibits online for yourself at

http://www.flysfo.com/museum/exhibitions/map#.
Part of the Museum’s programming is a free, hands-on educational program for grades 2-3 on the *China Clipper* exhibit that “…presents the history of the world’s first regularly scheduled transoceanic commercial air service in heavier-than-air aircraft, which began November 22, 1935, on San Francisco Bay” (*China Clipper Ed Prog 08-2016*). The Museum can also expand programming to older students, a mix of ages, or those with special needs with prior notice. While the museum provides educational tours, there is no education department or staff. The Librarian and Aviation Curator conduct the program 20 to 30 times a year, among their many other responsibilities. Increasing the grade-range, conducting classroom visits, or expanding the types of activities done during the program would be ideal, however the Museum does not currently have the capacity for such expansion.
To strengthen SFOM’s education offerings, I propose creating materials for SFOM to provide to visiting educators before their visit with a group of children. The goal of these materials would be to improve the educational impact of group visits to the museum by giving teachers who bring their classes to the museum a preview of the visit and offer suggestions for extended learning. This proposal is supported by research from the field. For example, in a survey of teachers in Vancouver, Canada by Anderson and Zhang, one grade 5 teacher states that, “I think that pre-visit [materials] are more important [than post-visit] …” (p. 8, 2003). Additional research by Anderson and Lucas at the Queensland University in Australia supports the theory that if students were familiarized with the material beforehand, their experience was more worthwhile (1997).

The pre-visit materials that I propose would provide introductory information on the museum, expected behaviors and rules to abide by, aviation and air travel, suggested readings, and fun activities for students and teachers visiting the China Clipper exhibit. The permanent exhibit at the Aviation Museum and Library features an original propeller, one of the many “artifacts, models, documents, and photographs dating from the inauguration of service in 1935 to the end of the flying boat era in 1946” (China Clipper, n.d.). The pre-visit materials will use the museum artifacts, personal histories of those involved with the China Clipper flights, and basic aviation history and terminology to cover a broad range of subjects that teachers can use to integrate into their own lesson plans. To determine the best way to present the pre-visit material and determine topics to cover, I propose an initial focus group with local second and third grade teachers to gather their input. In partnership with these teachers and the SFO Museum staff, the suggested topics and subjects listed below could be further explored in the classroom with
questions and concluded at the Museum with answers:

- **STEM (Science, Technology, Engineering, and Mathematics)**
  
  - Comparing distances travelled from before and after airboats were introduced and making educated hypotheses on current travel times. By allowing children to openly hypothesize they will learn more about STEM than from any lecture (Adams, 2016). The current graphics created by SFOM and shown during the field trip can be seen in Figure 3:

  ![Traveling Across the Pacific Ocean](image)

  **Traveling Across the Pacific Ocean**

  Seventy-five years ago, it took twenty days to travel the 8,900 miles from San Francisco to China on a ship. On a flying boat, it only took six days. There were five stops on islands along the way where flying boat passengers would spend the night in hotels, and then take off again in the morning. Let's move the ship and the flying boat across the Pacific Ocean to see the difference in how far they can travel each day.

  Figure 3: Comparing travel by sea and air. *(China Clipper Ed Prog 08-2016 [PDF], 2016, p. 2)*

- Calculating distances travelled using basic mathematics.
  
  - Conduct a classroom experiment using string, drinking straws, balloons, paper, and
tape. Give the students their straw “airplanes” and let them tape or glue paper wings to the body of the straw. Will certain types of wings work better? Is there such a thing as too many wings? Thread the string through the straw to create a flight path and have the children blow up the balloons as much as possible. Attach the blown up balloons to the straw and watch your “airplanes” take off! Hypothesize on the distance the balloons will push their airplanes depending on size or placement.

- Experimenting with the physics of flight with a piece of paper as described by Bogle in *The Wonder and Science of Flight* (2014):
  
  “Cut a piece of loose leaf paper into 1” wide strips and press [the short end of] one strip up against your bottom lip. Now, blow a steady stream of air out across the top of the paper. You would think that the nothing would happen, because the paper is beneath the stream of air. You would think that the strip of paper would simply fall down and lay against your chest. But science would prove you wrong! The strip of paper will ‘fly’ like an airplane.”

The above experiments incorporate STEM concepts and guided play, which continue to be an exceptionally popular choice in museum education for children (Shaffer, 2015).

- The different purposes of airplane parts and how they could best be used using the three main flying boats from the Pan American Airways fleet - the Sikorsky S-42, Martin M-130, and the Boeing 314 reinforces the STEM principles of developing and testing hypotheses based on presented evidence. The current graphics created by SFOM and shown during the field trip can be seen in Figure 4.
Figure 4: Comparing parts of three of the flying boats used by Pan Am. *(China Clipper Ed Prog 08-2016 [PDF], 2016, p. 2)* Magnets of these three airplanes could be made as an instructional material for teachers to keep in their classroom.

- **Social Studies**
  - Histories of the people involved with the Pan American Airways operations of the China Clipper:
    - Captain Edwin Musick, Pilot of the inaugural flight out of Alameda *(Musick, n.d.)*
    - Navigator Frederick Noonan, Navigator of the inaugural flight of Alameda and his subsequent disappearance with Amelia Earhart over the Pacific Ocean *(Musick, n.d.)*. The STEM skill of making educated guesses can be incorporated here.
    - Clara Adams, an aviation enthusiast who booked her own tickets on several inaugural flights *(Grossman, n.d.)*.
Below is a suggested list of additional women and people of color not related to the China Clipper exhibit to integrate into a classroom activity. Showing aviation’s diverse background demonstrates to all students that they too can be part of history:

- Bessie Coleman, the first African-American man or woman and Native-American to receive a pilot’s license (100 Most Influential Women, 2003).

- Katharine Wright, sister of Wilbur and Orville Wright and their financial benefactor (100 Most Influential Women, 2003).

- Katherine Cheung, the first Asian-American woman to earn her pilot’s license (100 Most Influential Women, 2003).

- Geraldine Mock, the first woman to fly around the world, seven years after Amelia Earhart died trying to accomplish the same task (100 Most Influential Women, 2003).

- Juan Pablo & Eduardo Aldasoro, the first Mexican aviators (Kakoshi, 2015).

- The Tuskegee Airmen, the first squadron of Black military pilots (History of the Airmen, n.d.).

- Cornelius Coffey, the first Black man to have a pilot’s license and Coffey opened the Coffey School of Aeronautics so other aspiring African-American pilots could learn to fly (History of the Airmen, n.d.).

- Jessica Cox, a Filipino-American woman who was born without arms received her pilot’s license in 2008 and became the first person to fly with only her feet (Asian-Americans in Aviation, n.d.).

- Art
Folding paper airplanes is an activity currently offered during the SFO Museum field trip. It can be expanded in the classroom with different types of paper airplanes, experimenting with decorations as weights, exploring how visuals printed on a flat surface change when paper is folded, and as a cultural lesson in the art of origami. Figure 5 shows one of the paper airplane outlines students use at the Museum.

Figure 5: Paper airplane guide. (*China Clipper Ed Prog 08-2016* [PDF], 2016, p. 3)
These additional materials create more opportunities for engagement before, during, and after the visit for both the students and the teachers, which will make the trip more worthwhile. In collaboration with the SFO Museum’s staff, it will be possible to integrate the various topics covered in the *China Clipper* exhibit with curricular needs like STEM learning in addition to the arts and social studies. By considering standards from the National Science Education Standards (NSES) such as developing investigative questions and encouraging natural curiosity into the SFO Museum’s education program, teachers will have more support in their lesson planning (Brooks, p. 14).

As the Museum prepares for its American Alliance of Museums (AAM) reaccreditation review in 2018, it looks towards the mission and goals listed in the SFO Annual Report and Strategic Plan from 2016, which are as follows (See the entire list of goals in Appendix B):

The mission of SFO Museum is to provide a broad range of exhibitions and educational programs, collectively represent the diversity of human achievement, enrich the public experience, and differentiate SFO from other airports” (SFO Museum Annual Report, 2016).

The two relevant goals of the museum for this proposal from the 2011-2016 Strategic Plan:

1. Provide and continue to improve the educational and children’s components of SFO Museum

This project would support both the mission and goals 5 and 6 by developing materials to create a more engaging learning experience for the school groups visiting the Museum and by
elevating the SFO Museum’s education program, which would generate more recognition of the Museum. If expansion of the education program to additional grade levels or increasing the number of tours given is not currently possible, creating a more in depth learning experience for the tours that currently attend the program is. Also, due to the limited amount of time the museum staff must dedicate to these tours, having materials that are easily sent out would be a conscious effort to reduce additional burden outside of the initial creation of the materials. If this project proves successful, the SFO Museum can decide to expand the education program or develop an education department to help further its mission and goals and collaborate or even consult with other airport museums seeking to develop their own education program.

Goal 1: Improve participation in the education program.

Objective: Consult with Aviation Curator and Librarian/Collections Manager for specific topics they cover while on the field trip and type of information they would like students to come prepared with.

Objective: Consult with second and third grade teachers and the California Common Core standards on the type of information and lessons children should be learning at that age.

Objective: Create visually appealing materials based on the feedback from SFOM staff and educators.

Goal 2: Increase awareness of SFO Museum brand.

Objective: Reach out to the local schools near SFO Airport to promote the education program and the fact that the education program and the Museum are free.
Objective: Maintain excellent relationships with teachers who have already taken the tour and encourage repeat visits through post-visit surveys and continuously updating the pre-visit materials and education program based on that feedback. See the current and proposed survey in Appendix C.
CHAPTER 4 – ACTION PLAN

Below is a proposed action plan for developing pre-visit materials for the SFO Museum’s China Clipper exhibit education program geared towards second and third graders (Education Program, n.d.). The scope of this project currently focuses only on the San Mateo County area school districts, which totals 17 elementary school districts containing approximately 100 elementary or K-8 schools (San Mateo County Office of Education, 2016). If successful, this project could be expanded to additional grades and local counties.

The timeline is created with the intention of all materials being ready to ship in time for the start of the August 2017 school year.

Parties and Roles Involved:

<table>
<thead>
<tr>
<th>Name or Title</th>
<th>Role and Responsibilities</th>
<th>Estimated time commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curator IV - Collections Manager and Librarian</td>
<td>Guide content development, review and approve content, conduct tours</td>
<td>8 weeks, part time and distributed throughout the 8 months</td>
</tr>
<tr>
<td>Curator III - Aviation Curator</td>
<td>Guide content development, review and approve content, conduct tours</td>
<td>8 weeks, part time and distributed throughout the 8 months</td>
</tr>
<tr>
<td>Senior Management Assistant</td>
<td>Manage pre-visit material distribution, schedule tours</td>
<td>2 weeks, part time</td>
</tr>
<tr>
<td>Project Assist</td>
<td>Conduct research with Curator IV, Curator III, and teachers; compile and draft content</td>
<td>8 months, part time</td>
</tr>
<tr>
<td>10 – 20 Local Teachers</td>
<td>Attend education program focus group and provide feedback</td>
<td>1.5 - 2 hours</td>
</tr>
<tr>
<td>Graphic Designer</td>
<td>Make content beautiful and in an easily digestible format</td>
<td>1 month, part time</td>
</tr>
</tbody>
</table>

January 2017 - 1 month of development research with staff
1. First meeting about creating pre-visit material with Curator IV, Curator III, and Senior Management Assistant
   a. 2 hours
   b. Curator IV and Curator III, and additional parties as is relevant

This will be an initial meeting about the pre-visit materials: what they are and how they can support the current education program. This meeting will also: provide time to brainstorm future staff needs, schedules, or requirements, ensure they have access to museum specific resources provided (previous education tour evaluation forms, etc.), and determine four possible dates Reading Room will be available to hold focus group. The first two dates will be used for definite focus group dates, the second two will be for additional teachers.
2. Review field trip evaluations  
   a. 2 days  
   b. Project Assist  

   Synthesize comments and critiques. Develop contact list from teachers who have taken the tour to see if they would come in for the focus group with new teachers.

3. Create contact list of local teachers  
   a. 3 days  
   b. Project Assist  

   Develop a contact list of schools with second and third grades classes and the teachers of those classes. Add former field trip participants.

4. Content development  
   a. Half day  
   b. Curator III and Project Assist  

   Sit down with Curator III to determine the specific topics he covers and where he would like to see student participation. Topics he would like teachers to cover with their students, potential leading questions he can give teachers about topics covered, and determine his expectations for the field trips.

5. Content development  
   a. Half day  
   b. Curator IV and Project Assist  

   Sit down with Curator IV to determine the specific topics she covers and where she would like to see student participation. Topics she would like teachers to cover with their students, potential leading questions she can give teachers about topics covered, and determine her expectations for the field trips.  

   Share graphics created by SFOM that would be useful for the future.  

   Determine appropriate dates for teacher meeting, food, honorarium, parking costs.

6. Contact list of local teachers  
   a. Half day  
   b. Project Assist  

   Email or call at least 50 teachers with an anticipated response of 20% for a pool of 10-25 teachers to interview at dates as specified with Curator IV, Curator III, and Senior Management Assistant.  

   [Repeat step as necessary every week until enough teachers have agreed]

7. [Milestone] Jan 31 Create and send out confirmation emails  
   a. 1 hour  
   b. Project Assist  

   Email teachers with directions, topics covered, parking instructions, confirm attendance.
**February and March 2017 – 2 months for teacher focus group**

There will be 2 dates for teachers to choose from, with a max capacity of 8 per day. If more teachers respond positively to the focus group, we can add additional dates as needed.

8. Feb 1 - Prepare materials for teacher focus group
   a. 1 day
   b. Project Assist
      Develop a questionnaire for teachers to fill out about their field trip habits, good/bad experiences, expectations, etc. Send out for approval.

9. Feb 7 - Assemble materials for teacher focus group
   a. 1 day
   b. Project Assist
      Assemble packet with copies of *China Clipper* exhibit, questionnaire, money for food/honorarium/parking, SFO pencil or pen, SFO notepad or paper. Have additional packets available for unexpected additions

10. February 20 - Send out confirmation emails the day before the first meeting.
    a. 1 hour
    b. Project Assist
       Re-express excitement and gratitude for their participation in the focus group.

11. Meet and Greet on Tuesday, February 21 after school around 4pm
    a. 1 day - prep, 1.5-2 hours for actual focus group, regroup after focus meeting
    b. Project Assist prep and focus group, Curator IV and or Curator III for focus group
       Welcome the teachers, give them a small tour of the museum and abbreviated field trip run through, provide time for group to purchase food at Burger Joint in International Terminal A, next door to the Museum. Focus group will take place in the Museum’s reading room.
       Send out thank you notes the day after the meeting.

12. Repeat Steps 10 - 11 again on Wednesday, March 1

13. If needed, repeat Steps 9 - 11 again on Thursday, March 9

14. If needed, repeat Steps 9 - 11 again on Friday, March 17

15. Synthesize focus group information
    a. 2 weeks
    b. Project Assist
       Take information from handouts, personal observation, notes, Curator IV and Curator III’s observations from the focus groups and summarize findings. Can be done starting after first focus group and see how different teachers respond. Find recurring patterns.
April 2017
16. Combining focus group research with field trip content research
   a. 3 weeks
   b. Project Assist
   Develop a report of our findings from the focus group, how it can be integrated with the earlier research done by the curators, what Curator IV and Curator III’s goals and wishes are for students who participate in the education program. Create mockups of pre-visit materials for approval.

17. [Milestone] Submit report to Curator IV, Curator III, etc. for review and approval
   a. 1 day for their review, another week for SFO/SFOM review and approval
   b. SFO/SFOM
   Review and approve or edit aspects of the report and proposed pre-visit materials.

May 2017
18. Review critique of initial report, make changes
   a. 2 weeks
   b. Project Assist
   Make any necessary changes as required by SFO/SFOM to mockups, answer any questions that developed from the focus groups’ visits.

19. Resubmit to SFO/SFOM for approval
   a. 1 week
   b. SFO/SFOM
   Take information from handouts, personal observation, notes, Curator IV and Curator III’s observations from the focus groups and summarize findings. Can be done starting after first focus group and see how different teachers respond. Find recurring patterns.

20. Seek out graphic designer
   a. Concurrently with SFO approval time
   b. Project Assist
   Determine if graphics/pre-visit materials will be done in house or with contractor. Find contractor if not done in house.

June 2017 [Milestone: Pre-visit material content is approved]
21. Have graphic designer contract approved if not done in-house
   a. 1 day
   b. SFO/SFOM

22. Work with graphic designer to create pre-visit materials
   a. 2-3 weeks
   b. Project Assist and graphic designer
   Be available for graphic designer to ask questions about aspects on design or content.
23. Submit to SFO/SFOM for approval or edits
   a. 1 week
   b. SFO/SFOM

24. Make any required edits
   a. 1 week
   b.Graphic designer and Project Assist, if required

July 2017 [Milestone: Pre-visit material graphics are approved]
25. Resubmit to SFO/SFOM for approval
   a. 1 week
   b. SFO/SFOM

26. Send finished materials out for printing, cutting, etc.
   a. 1 week
   b. Project Assist
   Pick up materials, double check for quality, printing mistakes.

27. Assemble pre-visit material
   a. 1 week
   b. Project Assist
   Create all packets for field trips in the fall semester, starting with already confirmed classes.

28. Provide Curator IV and Curator III with copies
   a. Insignificant
   b. Project Assist

29. Send packets to all classes with confirmed field trips
   a. 1 day
   b. Senior Management Assistant
   Once packets have been assembled, they can be given to Senior Management Assistant, who manages the field trip scheduling, for mailing at least one month prior to field trips; having them mailed out two months prior would be ideal given that teachers may need additional time to go over the materials and share them with the class. Having packets finished by mid-July allows them to be ready for any field trip that might be planned for the very beginning of the school year, however unlikely.

August 2017
30. Conduct field trips with the pre-visit materials in mind
   a. Ongoing
   b. Curator IV and Curator III
   Now that students are arriving with some prior knowledge of what will be covered in the China Clipper exhibit as well as some aspects of how planes work, see if certain topics
covered in the pre-visit materials are discussed more deeply by the children or if they ask more thoughtful questions.

31. Send email reminders to teachers to fill in their field trip evaluation form
   a. 1 day after field trip, ongoing
   b. Senior Management Assistant

To maintain analytics and evaluations on field trips continue to ask for field trip evaluation forms that are now modified to include questions about the effectiveness of the pre-visit materials before, during, and after the museum visit. (see Appendix C)

Ongoing

32. Compare evaluations of museum field trips
   a. Ongoing
   b. Project Assist

Ongoing evaluations from teachers of their experience using SFOM’s pre-visit materials will help determine if they were effective in improving the museum field trip experience, if it is prudent to expand the field trip experience to a larger audience, if it is worthwhile to continue spending money on creating pre-visit materials, etc.

Proposed operational budget

The proposed operational budget for initially developing these pre-visit materials will be minimal in the overall scheme of SFO Museum’s budget. The largest parts of the budget will go to the focus groups, the Project Assist, and the graphic designer as they are not on the SFO Museum staff.

<table>
<thead>
<tr>
<th>Description of Cost</th>
<th>Estimated Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>The budget for Curator IV’s time at the regular pay of $101,049.23 plus benefits $33,943.30 for a total of $134,992.53 annual salary with a work time of 8 weeks part time (‘Curator IV’ search results, 2016):</td>
<td>$10,384</td>
</tr>
<tr>
<td>The budget for Curator III’s time at the regular pay of $82,914.04 plus benefits $29,738.15 for a total of $112,652.19 annual salary with a work time of 8 weeks part time (‘Curator III’ search results, 2016):</td>
<td>$8,665.60</td>
</tr>
<tr>
<td>The budget for the Senior Management Assistant’s time at the regular pay of $86,773.01 plus benefits $30,997.07 for a total of $117,770.08 annual salary with a work time of 2 weeks part time (‘Senior Management Assistant’ search results, 2016):</td>
<td>$2,264.80</td>
</tr>
<tr>
<td>TOTAL GENERAL OPERATING EXPENSES</td>
<td>$19,314.40</td>
</tr>
</tbody>
</table>
The salary for Project Assist, with a baseline rate of $35/hour, would equate to $22,400 for working 8 months at a part-time basis.

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$22,400</td>
</tr>
</tbody>
</table>

The salary for the graphic designer, if hiring an outside contractor, would equate to approximately $2,500 for working on this project part-time for 3-4 weeks depending on how the approval process goes.

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$2,500</td>
</tr>
</tbody>
</table>

**TOTAL ESTIMATED COST OF LABOR**  
46,214.40

**Additional supplies**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box of 100 8.5x11 Envelopes $.2499 each = $24.99</td>
<td>$24.99</td>
</tr>
<tr>
<td>Box of 750 address labels $0.00932 each = $6.99</td>
<td>$6.99</td>
</tr>
<tr>
<td>Item</td>
<td>Cost</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Envelopes $0.2499 per envelope</td>
<td>$0.2499 x 50 = $12.50</td>
</tr>
<tr>
<td>USPS Postage for 16 oz. Media Mail $2.61</td>
<td>$2.61 x 50 = $130.50</td>
</tr>
<tr>
<td>2 address labels per envelope x $0.00932 each</td>
<td>$0.0186 x 50 = $0.09</td>
</tr>
</tbody>
</table>

Cost per packet = 7.5585

**TOTAL ESTIMATED COST FOR PRE-VISIT MATERIALS**

50 initial packets = 377.93

**TOTAL COST**

$47,654.86 – $48,717.942

Funds will be provided by the General operating budget of the SFO Museum.

Priority: This is high on the priority list for the SFO Museum. As part of its Strategic Plan, they seek to “Provide and maintain an educational and children’s component to the SFO Museum” (SFO Museum). By developing these pre-visit materials, the students coming to the SFO Museum will receive extra support in their learning, and teachers will receive extra support in creating lesson plans and finding new ways of learning in their classrooms.

Other Related Projects: Curator IV, Curator III, and Senior Management Assistant all hold positions unrelated to the education program that could take priority over conducting or organizing field trips. The Curator IV position includes duties as Librarian, Collections Manager, Intern Manager, and Education Guide. Curator III’s position includes duties as the Aviation Curator in addition to being the featured lecturer during field trips. Senior Management Assistant’s position includes other duties like managing volunteers and organizing and supervising private events.

- **Scope Including Key Deliverables:**
  - The key deliverable is the packet of pre-visit materials. These materials will cover such topics as the various types of planes used by Pan American Airways, the changes airplanes created in travel, the lives of the people involved with the first flights across the Pacific Ocean, the basic principles of flight, and ways history has changed as compared to the generation of the students’ grandparents or great grandparents.
  - Additional deliverables will be the surveys and talking points provided by the teachers from the focus groups. This information could be key to further exploring new avenues of field trip tours, something that is part of the SFO Museum strategic plan, and possibly lead to the development of an educational department.

- **Out of Scope:**
  - While the SFO Museum should first focus on creating a richer program for its existing grades the natural inclination is to subsequently expand that to all grades and all schools in the counties surrounding SFO. While ambitious, those plans are outside the scope of my project. Due to a very limited staff, budget, and time, it is best to save those plans for a later date.
Assumptions:
Basic assumptions this action plan has made is the format of the education program, the capacity for the SFO Museum to expand its education program to have more students coming through its doors, and the fact that the SFO International Airport can cover the costs of the materials as they currently do.

Constraints:
Possible constraints of developing this program would be the capacity for expansion. As stated before, the key individuals involved with conducting the education tour may no longer be able to dedicate the time to multiple tours each week, let alone several tours a day. An additional constraint would be the capacity of the museum space that is currently allocated to museum field trips. While it can hold about 20 young children comfortably, having more than one class, or having older students could pose a problem.
CHAPTER 5 – CONCLUSIONS

The SFO Museum’s reputation as a tourist destination continues to grow beyond those traveling to and from the SFO Airport. As they seek further avenues to gain a more diverse audience, children who have gone through the Museum’s education program will hopefully become repeat visitors. The SFO Museum’s education program goes beyond aviation to make a relatively new scientific advancement and mode of transportation available to children of all backgrounds regardless of economic or education factors.

This proposal is purposely formatted to provide for potentially long approval times, given the bureaucracy of a publicly run airport, and is conscious of the other duties key players have. Nonetheless, the project will still be completed in time for the start of the 2017 school year, if not earlier. With the possibility to interact with hundreds of classrooms in San Mateo County more deeply, this plan would have a wide reach in addition to potential for collaboration with other airport or aviation museums. Once finalized, the pre-visit materials could be shared with other airport museums seeking a base model for their own education programming, once again elevating the SFO Museum as a leader in its field.

To first measure success for the pre-visit materials, evaluation through post-visit survey forms will occur throughout the school year. The Museum currently utilizes a post-visit evaluation form and an update to the form would simply require adding a few questions about the pre-visit materials, as seen in Appendix C. Receiving positive reviews of the pre-visit materials and the effect they had on the field trip is essential; however, criticism of the program would be taken seriously and put under heavy advisement that improvements could be made. The goal of the materials is always to improve the learning experience for those visiting the
museum, if those goals are not being met or are falling short of their intended impact, then reevaluation of the pre-visit materials will need to be done.

In conclusion, my initial reaction to the SFO Museum’s various activities was the students are certainly having fun, but I did not believe that they were actually learning something. Upon further research into the intersection between play and learning I was awestruck at the amount of positive results that support it from such a simple activity.

The SFO Museum staff are very proud of their AAM accreditation. By expanding its education platform, the Museum can continue to provide top notch programming and maintain its accreditation status. Possible next steps for this proposal include expanding it to additional schools beyond San Mateo County, increasing the grade levels that can participate, or hiring a dedicated education staff member to host programs multiple times a day for children and for passengers traveling through SFO airport. Air travel, though seemingly common, is still an expensive luxury that not all will have the opportunity to experience. The SFO Museum brings that experience and the wondrous image of flight to children who may be too young or economically disadvantaged to have experienced air travel. As stated by British science fiction writer Arthur C. Clarke, “Any sufficiently advanced technology is indistinguishable from magic” and what could be more magical than first learning about the science of flight and the people who were pioneers in the aviation field and then watching hundreds of thousands of pounds of steel glide smoothly through the air or experiencing it first hand (Sir Arthur’s Quotations, n.d.).
Appendix A: Annotated Bibliography


Adams and Parlakian are early childhood educators at ZERO TO THREE, a non-profit organization that “promotes the health and development of infants and toddlers by translating research and knowledge into a range of practical tools and resources for use by the adults who influence the lives of young children.” Their article breaks down the different aspects of scientific learning for infants and toddlers between the ages of zero to three years old. They stress the fact that one does not need to be a scientist to support scientific inquiry and provides several great ways to support those curiosities. This will be a very helpful tool in formatting potential programming for the SFO Museum.


This study seeks to further expand on the ideas presented in *Cultivating Communities of Practice* by Wenger, McDermott, and Snyder (2002) in which, “communities can be purposefully set up to, ‘share a concern, a set of problems or a passion about a topic.’” In this case, museums would fall under both an informal learning environment for visitors and formal learning environment for educational programs. The authors consulted with community members and experts and were
thorough in reporting their methodology. The customized nature of the program the authors implemented makes it difficult to apply to all types of museum education; however, the overarching conclusion of community involvement supports the theories of several other articles here.


Anderson and Lucas explore how the different levels of interaction a student has with the museum prior to visiting could influence the impact of the exhibit on the child. For this study, the authors used the term “novelty reducing” as an overarching way of showing the students types of exhibits, the exhibit layout, behavior expectations, and even the store of the museum before the students’ initial visit. By “reducing novelty,” the students all experience a more thoughtful museum trip. It was confirmed that children who had both visited the museum before and received the novelty reduction performed the best on post-visit questions. They suggest that perhaps the significance of a prior visit would be the most impactful action educators could take. Their findings were consistent across gender, age, and socio-economic background, an important factor when trying to create an education program for a diverse audience. The authors cite similar studies that will be useful.

The authors are all professors in early childhood education as well as former early childhood education teachers (PreK-3). Their research proposes that teachers should prioritize print-rich environments because having many different types of media from which to read (charts, labels, books, lists, etc.) promotes early literacy development. The article suggests different ways educators can integrate more printed reading materials into the classroom and throughout lesson plans. This is an especially helpful article that supports my initial idea of recreating the SFO Museum activity book. The article also emphasized how important putting pencil to paper is and does not mention the use of electronics.

Diamond, J., Horn, M., & Uttal, D. H. (2016). *Practical Evaluation Guide: Tools for Museums and Other Informal Educational Settings* (Third ed.). Lanham; 4: Rowman & Littlefield. First published in 1999, this re-release addresses timely issues in the face of large budget cuts and a need to prove relevancy in an increasingly online world. The book walks the reader through an evaluation at each chapter. Luckily, based on my earlier discussions with SFO Museum staff, I already know some of the areas that they would like to improve upon and on which to base my capstone. After implementing my capstone project, I would certainly be interested in using this text to conduct an evaluation of my proposal.

File, N., Mueller, J. J., & Wisneski, D. B. (2012). *Curriculum in Early Childhood Education: Re-examined, Rediscovered, Renewed*. New York: Routledge. The compilation of essays from educators all around the world ranges in topic from the early role of women in education to how children from a range of economic backgrounds learn differently and how to address those issues. The essays focus on the ever evolving times in terms of race,
sexuality, gender, and how teachers are changing and embracing new methods to teach children. These essays focus more on theoretical analysis of education and curriculum development throughout the past century rather than specific action plans that would be applicable in a modern classroom.


At the Gilcrease Museum in Tulsa, Oklahoma, babies have been invited to learn about the art and artifacts of the region regardless of their current ability to even say “Gilcrease Museum.” The program is offered in partnership with Tulsa Community College and provides a community building environment through the use of touch, sound, and smell. In contrast with the current trend of including scientific or STEM subjects in every programming aspect, Goble, Wright, and Parton bring the humanities to the forefront. The Gilcrease Museum’s initial goal in the program was to engage families when they were young in order to have more lasting involvement with the Museum as they aged. The highly collaborative nature between departments and feedback from the families involved created an ever evolving and highly successful program that was in its third year as of the article’s publishing. The article provides excellent suggestions for creating a cohesive social studies program.


This article, written by the administrator of the McCarran Aviation Heritage Museum, details the
impact of a museum in a place as noisy as Las Vegas and the communities it serves. Many facts are repeated in Kramer’s thesis on the same topic, but it is interesting to learn about the museum from Hall-Patton’s own perspective. This article was written in 1997, long before the events of September 11, so many aspects of the museum may have changed, which would require further investigation.


Harrison explores *Play School*, the Australian equivalent of *Sesame Street*, and how early childhood education is impacted by meaningful play and participation. The promotion of supporting the intelligence of children and aspects of social justice while interacting with children through a TV screen is impressive. The personalized nature of the show and deliberate actions by the hosts to ask directed questions, actively seek input, and encourage exploration contribute to the success of the program. Their researched actions result in one of Australia’s longest running children’s shows. Several of the concepts that make *Play School* successful are echoed in other research cited here.


Published in 1997, this collection of essays addresses potential issues that can arise in a
classroom situation. The first half of the book addresses social, political, and historical trends in early childhood education, which is not highly relevant to the SFO Museum. However, the second half of the book investigates trends in teaching practice which can be useful, such as the power of play in the classroom. Overall, the book focuses more on classroom teachers and learning in a strict classroom environment and does not address cultural field trips or museum education.


This study of 176 children who participated in an arts program at the Salvador Dalí Museum in St. Petersburg, Florida saw a correlation of positive growth in self-concept with involvement in arts education and art therapy. The authors are from the Department of Psychiatry and Behavioral Neuroscience at the University of South Florida College of Medicine and conducted this study in partnership with staff from the Dalí Museum. The analytical study supports similar research done on the correlation between arts education and a better sense of self. The authors pull similar findings from other studies to support their hypothesis, which is helpful for my bibliography.


Kramer’s master’s thesis on museum operations in American airports is one of the few academic theses written on the subject. Kramer conducted personal interviews with the four airports that
were selected based on their extensive exhibition programming. He also discusses the impact of an airport museum and its value to the larger community. The personal interviews are especially useful as they discuss the similarities and differences between the museums as well as their cultural goals, value, and implications of running a museum in such an unusual environment. Written in 2013, the interviews are still relevant, though some of the numbers for visitors are now outdated.


This article focuses on teachers in the classroom and addressing the restrictions a teacher may feel in implementing STEM education in early childhood learners. The larger focus on professional development rather than implementation makes this article less relevant to my needs. The authors discuss the value of integrating STEM qualities like scientific inquiry and engagement throughout the day rather than having a designated “science time” lesson, which is how many of the teachers described their lesson plans. They concluded by encouraging other teachers to send in their suggestions and providing their magazine column as a community space.


Mudiappa and Klucznoik, researchers at the University of Bamberg, Germany, investigate the rate of visiting institutions of cultural learning in the early childhood and the parental factors that
influence those decisions in German families. Data were collected based on a self-reported rating scale with variables such as how often they visited cultural institutions, how important educational beliefs were, and the number of books in the household. The general findings were that families that visited cultural institutions the most frequently were also those who valued education and cultural resources the most. Income did not influence the rate at which families visited cultural institutions. It would be interesting to see if this same trend holds true in America where cultural institutions usually charge for admittance or in areas with parents who have a lower level of education. This study, while interesting, is not the most relevant for the purposes of my capstone.


Saracho, Professor of Education in the Department of Teaching, Learning, Policy, and Leadership at the University of Maryland, provides a contemporary perspective on how children learn in and out of the classroom. The idea of “play” was previously not thought of as a time for learning, but as we have come to discover, learning and playing can be one in the same. Saracho devotes entire chapters for each of the nine subjects in which children can learn and play. For each chapter, she provides prompts for interactions between the teacher and the student, numerous ways to integrate museum field trips, and offers simple supply lists to stock a classroom. Taking suggestions from each chapter could easily fill the proposed SFO Museum workbook at a variety of age levels.

Written before the attacks of September 11, this article by Marjorie Schwarzer, a professor of museum studies at the University of San Francisco, brings to light the then revolutionary idea to house a museum within a working airport. Schwarzer details some of the reasons why an airport might want to go through the effort of developing a museum and uses the AAM accreditation of SFO Museum (then San Francisco Airport Museums) in 1999 as a turning point. She then describes the Howard W. Cannon Aviation Museum at McCarren International Airport in Las Vegas and Sky Harbor International Airport in Phoenix as additional examples. This will be a good resource for additional sources on airport culture, though potentially outdated due to the changes made in airport security.

Shaffer, S. E., (2014). *Engaging Young Children in Museums*. Walnut Creek, CA: Left Coast Press.

Shaffer, founding Director of the Smithsonian Early Enrichment Center [SEEC], explores the intersection between young children and museum learning with a mixture of theory and practicality. Shaffer devotes Section I, Chapter 3 to four themes of learning theory: experience, play, ways of knowing, and motivation, then segues into practical approaches for classroom teaching. I’ve started seeing recurring suggestions for teaching theories such as the Reggio Emilia Approach, which will require further investigation as to how they can be implemented at the SFO Museum. One especially helpful chapter for me is the outlined lesson plans that guide the reader through different environments.

Originally published in 1979, several sections in this book still ring true today, specifically the section on the importance of play in early childhood education. I was especially entertained by the section “Developments Since the 1950’s” where it stated that mothers no longer felt they were “shirking one’s motherly duties” by allowing their children to attend preschool. This text is an excellent view into the past, providing a historical perspective on the roles of educators and students and the newly formed concepts of effects that factors like race, socioeconomic background, or gender can have on an educational experience.
Appendix B: Project Stakeholders

Stakeholders for this project include visiting students, teachers, future airport museum education programs, and the SFO Museum. Students will benefit from this program by receiving a deeper understanding in aviation science and aviation history presented in an original and unique environment. Teachers at nearby schools hold a stake in the success of this program as they will benefit from the creation of free and accessible teaching tools. Staff stakeholders include the Curator IV, Curator III, and Senior Management Assistant who are directly involved with the education program. Additional staff members are indirectly invested in the education program and its success because success for one part of the Museum’s mission is a success for all.

The students who visit the SFO Museum are treated to a unique experience that no other museum in the United States can provide. Their role is to experience important aspects of their education through the fun and one of a kind setting in the airport environment.

Teachers will gain a deeper understanding of the history and science of aviation for their students. They can expect to use their collective years of teaching experience to shape the Museum’s education program in a way that makes it as useful as possible for implementation in a classroom and museum environment. The Museum will count on the teachers to provide constructive criticism and creative feedback for use in the pre-visit materials and to improve the field trip experience.

The mission of SFO Museum is to provide a broad range of exhibitions and educational programs, collectively represent the diversity of human achievement, enrich the public experience, and differentiate SFO from other airports” (SFO Museum Annual Report, 2016).
Listed below are the six goals of the museum from the 2011-2016 Strategic Plan:

1. Meet and exceed American Alliance of Museums (AAM) standards and accomplish the AAM-mandated improvements for a successful reaccreditation review in 2018, and thus remain leaders in our field.

2. Produce new museum exhibitions and programs throughout the Airport and in all the terminals that will communicate and reflect the Airport’s commitment to culture and education.

3. Continue the development of the San Francisco Airport Commission Aviation Library and Louis A. Turpen Aviation Museum as a leading repository for the history of commercial aviation with an emphasis on the Pacific Rim by sustaining professional standards of operation in collection development, research services, exhibition programming, and event use.

4. Assist with the necessary maintenance and conservation of the Airport’s permanent art collection.

5. Provide and continue to improve the educational and children’s components of SFO Museum

Appendix C: Current and Proposed Education Program Evaluation Form

Current evaluation form:

SFO Museum
Education Program Evaluation

Please rate your answers on a scale of 1 (not at all) to 5 (very well).

How well did this program meet your educational expectations for your students? 1 2 3 4 5
Comments:

How well did the Instructors understand and relay the information? 1 2 3 4 5
Comments:

How engaging were the Instructors as storytellers, and in providing interactive, multi-sensory activities? 1 2 3 4 5
Comments:

How well did the material fit within your curriculum? 1 2 3 4 5
Comments:

How appropriate was the material to the grade level of your students? 1 2 3 4 5
Comments:

What did you like best about the program?

What did you like least about the program?

Why did you choose SFO as a fieldtrip destination for your class?

Do you have any recommendations to help us improve this program? (Please use back if necessary.)

Program Date:_________________ Exhibition:____________________________
School Name:________________________________________________________
Teacher:_________________________________________________ Grade:_____ #Students:___________
Email:_____________________________________________________________

Thank you for taking the time to complete this survey. We appreciate your comments and suggestions. Please go to http://www.sfmuseum.org for future programs and announcements.
SFO Museum, P.O. Box 8097, San Francisco, CA 94128 650-821-9911
Proposed evaluation form to include pre-visit material assessment:

**SFO Museum**

**Education Program Evaluation**

Program Date: ___________________ Exhibition: ____________________________

Additional Program Options Attended:

☐ Airport and AirTrain Tour  ☐ Meet the SFPD Service Dogs  ☐ Visit other Museum Exhibitions at SFO

School Name: __________________________________________________________

Teacher: ___________________ Grade: ________  # Students: ____________

Email: _______________________

Did you participate in SFO Museum’s education program focus group? ☐ Yes  ☐ No  When: __________

Would you like to participate in future education program focus groups? ☐ Yes  ☐ No

Please rate your answers on a scale of 1 (not at all) to 5 (very well).

How well did this program meet your education expectations for your students?  1 2 3 4 5

*Comments:*

How well did the pre-visit materials prepare your students for this program?  1 2 3 4 5

*Comments:*

How well did the pre-visit materials communicate relevant information?  1 2 3 4 5

*Comments:*

How well did the instructors understand and relay information?  1 2 3 4 5

*Comments:*

How engaging were the instructors as storytellers, and in providing interactive, multi-sensory activities?  1 2 3 4 5

*Comments:*

How well did the pre-visit material fit within your curriculum?  1 2 3 4 5

*Comments:*

How well did the field trip fit within your curriculum?  1 2 3 4 5

*Comments:*

How appropriate was the pre-visit material to the grade level of your students?  1 2 3 4 5

*Comments:***
How appropriate was the field trip material to the grade level of your students? 

Comments:

What did you like best about the program?

What did you like least about the program?

Why did you choose SFO as a fieldtrip destination for your class?

Do you have any recommendations to help us improve this program? Attach additional pages as necessary.
Appendix D: Additional Airport Museums in the United States

These museums are located within airport terminals or affiliated with publicly accessible airports within the United States. The museums located within the airport terminals are in bold.

Arizona:

- **Phoenix Airport Museum** at the Phoenix Sky Harbor International Airport
  
  [https://skyharbor.com/Museum](https://skyharbor.com/Museum)

California:

- **Aviation Museum of Santa Paula** at the Santa Paula Airport
  
  [http://www.aviationmuseumofsantapaula.org/about/](http://www.aviationmuseumofsantapaula.org/about/)

- Oakland Aviation Museum at the Oakland International Airport
  
  [http://www.oaklandaviationmuseum.org/index.html](http://www.oaklandaviationmuseum.org/index.html)

- **SFO Museum** at the San Francisco International Airport
  

Florida:

- **Airport Museum** at the Melbourne International Airport
  

Maryland:

- **College Park Aviation Museum** at the College Park Airport
  
  [http://www.collegeparkaviationmuseum.com/home.htm](http://www.collegeparkaviationmuseum.com/home.htm)

Nevada:

- **Howard W. Cannon Aviation Museum** at the McCarran International Airport
  
  [http://www.clarkcountynv.gov/parks/Pages/cannon-aviation-museum.aspx](http://www.clarkcountynv.gov/parks/Pages/cannon-aviation-museum.aspx)
North Carolina:

- **Dare County Regional Airport Museum** at the Dare County Regional Airport
  

- Carolinas Aviation Museum at the Charlotte Douglas International Airport
  

Ohio:

- **International Women’s Air & Space Museum** at the Burke Lakefront Airport
  

Texas:

- Flight Museum at the Dallas Love Field Airport
  

- 1940 Air Terminal Museum at the William P. Hobby Airport
  

Virginia:

- Steven F. Udvar-Hazy Center, a Smithsonian National Air and Space Museum annex at the Washington Dulles International Airport.
  
  [https://airandspace.si.edu/udvar-hazy-center](https://airandspace.si.edu/udvar-hazy-center)

Wisconsin:

- **Mitchell Gallery of Flight** at the General Mitchell International Airport
  
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