COLLABORATIVELY CREATING SPACES FOR ART AND MUSIC AT THE RITA ZNIBER FOUNDATION IN MOROCCO

AN ASSESSMENT OF ART AND MUSIC ROOM DESIGN THROUGH PARTICIPATORY DESIGN AND USABILITY TESTING IN CHILDREN AND ADOLESCENTS

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ABSTRACT

The Rita Zniber Foundation in Meknes, Morocco lacked a properly developed space for creating art and music. The goal of this project was to plan, renovate, and test two spaces for art and music in the hopes of fostering academic, therapeutic and emotional benefits. Using interviews, surveys, participatory design and usability tests, we created the room designs, renovated the existing spaces, and evaluated the usability of the rooms from the perspective of the users. Our report includes recommendations to the Zniber Foundation that will enable continued improvement of the rooms to enhance the potential benefit to the residents of the Foundation in the areas of art and music.

EXECUTIVE SUMMARY

The media of art and music can allow improvement in academics, have therapeutic aspects, and can serve as an outlet for nonverbal expression. However, Children at the Rita Zniber Foundation lack a proper space for creating art and music. Because of this, they are not reaping the full benefits of these media. The first step in bringing the benefits of art and music to the boys at the Rita Zniber Foundation is to properly renovate rooms specifically for the activities of art and music. The following executive summary recapitulates our processes, findings and recommendations in our efforts to bring art and music to the community at the Rita Zniber Foundation as can be seen in Figure 1.

FIGURE 1: ART AND MUSIC ROOMS BEFORE AND AFTER RENOVATION

Methodology

Our first step was the renovation of the room. For this task, we focused on key aspects of room design such as proper color, lighting, acoustics and maximum occupancy. Once the color and lighting of the rooms were in place, we moved to populate the rooms with furniture. In order

to accomplish this we utilized a participatory design method bringing the end users into the design. In completing this, we used multiple methods including;

- Interviews;
- A conceptual model task, in which we gave the users a scale model of the room and asked them to populate it with various pieces of furniture provided;
- And an artistic demonstration where the users drew themselves creating art.

From these we created three potential design models and presented them to Madame Ouafae to choose which design she most preferred for the space. Finally, we moved onto the usability study to assess how the users reacted to the rooms. We accomplished this task through two main methods;

- Written surveys of the users' feelings before and after using the two rooms;
- Giving groups of users a task to complete in the room and observing how they interact with the space.

Results and Recommendations

We then analyzed this data and compiled our findings into the following three major points and then made immediate and future recommendations from there;

- The design process was successful in coming up with a general consensus of how the rooms should be set up;
- Users share excitement about the rooms and the chance to learn art and music;
- Users strongly prefer to have traditional music lessons over free improvisation.

We recommend a financial plan for the sustainability of the rooms be put together.

While donations were collected during the project to fund the initial cost of the room, these rooms by nature will require additional funds the Foundation has not necessarily budgeted for, so a fundraising or budgeting plan should be put in place to make sure the rooms remain operational.

We recommend the Foundation create a usage organization system to limit the number of users in the room at a time.

In order to make sure the rooms don't get overcrowded, which heightens the potential for items in the room to be broken. The Foundation should make some sort of usage schedule to monitor the number of users in the room at one time.

We recommend the Foundation improve the acoustic atmosphere of the music room.

Due to material and time constraints this particular facet of the music room was not remedied. The Foundation should seek out and purchase cork board to be framed and hung in the music room to help improve the acoustic atmosphere in the room and reduce the echo that is currently present in the room.

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AUTHORSHIP PAGE

Each member of the group contributed equally to the production of this report and to the project's overall completion, which includes but is not limited to the renovation of rooms, collection of information and feedback and analysis of results.

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CHAPTER 1: INTRODUCTION

A large portion of the world's orphans currently call Africa home, with fifty-nine million, roughly one third of the world's orphan population, living on the continent. According to UNICEF (2011) Morocco alone has over 650,000 orphans (n.p). In addition, the Morocco News Board (2012), states "153 babies are born out of wedlock every day, and 24 of them are abandoned" to be placed in orphanages (n.p).

The Rita Zniber Foundation (n.d.), established in 1982, aims to assist in the administration of the UN Convention on the Rights of the Child and to guide orphans to a prosperous future. A nursery for orphaned babies, established by Rita Zniber in 1982 on the top floor of Mohammed V Hospital in Meknes, eventually expanded into an orphanage separated into a few different age groups. Le Nid continues to act as a nursery and includes the care and education of children until age six. The annex is a second facility for children over six, who are educated through public school. Yet another group of children is dedicated to those with special needs and disabilities (n.p.).

The director of the Rita Zniber Foundation, Madame Ouafae, is concerned that children at the orphanage struggle to express themselves and discuss their problems, many of which may stem from a feeling of abandonment. Without a proper outlet for nonverbal expression, children are at risk for developing many social problems. She believed that creating a space dedicated to providing these children an outlet in art and music would be beneficial.

One of the benefits of an arts education is academic improvement. Johnson (2006) mentions that music especially has been correlated with improvement in academics. Hallam (2001) showed that a strong musical education can also play a role in personal and social

development. These benefits however, require dedicated space and funding in order to achieve their maximum effectiveness.

Our goal was to renovate a space for proper art and music creation. We hoped this would start the process of allowing a nonverbal emotional release, as well as freedom of expression and various academic benefits. We renovated it properly after doing research on renovation techniques and the ideal conditions for education and creative expression. We determined factors such as furniture type and position, as well as types of instruments and art supplies through participatory design. This design process included interviews and studies with the users at the Foundation. We determined the success of our participatory design process through a usability study with the future users of the rooms. Finally, we made recommendations to our sponsor, Madame Ouafae, based on the results and observations of this project.

CHAPTER 2: LITERATURE REVIEW OF KEY MATERIAL

As you can see below in Figure 2, children at the Zniber Foundation lacked a proper space for creating art and music. Because of this, the boys at the Foundation could not reap the full benefits of these media including academic improvement, therapeutic aspects, and an outlet for nonverbal expression. The first step in bringing the benefits of art and music to the boys at the Rita Zniber Foundation is to properly renovate rooms specifically for the activities of art and music.

FIGURE 2: ROOMS PRIOR TO RENOVATION

The space needed to be renovated to meet both the technical and personal requirements for the Foundation's use. The literature in this review illustrates the necessary design elements important to incorporate when designing art and music rooms. We researched how these design elements could affect the end users of the room. To make the design process as effective as possible, we used a participatory design method. Our research on participatory design is included in this chapter. We aimed to make the final room product as appealing as possible for the boys at the Zniber Foundation by including them in the design process. We hoped that allowing the end users to have a say in the final design results in a higher population utilizing the rooms.

This chapter will discuss the literature on the following topics.

- Psychological implication of being an orphan;
- Benefits of art and music therapy;
- Benefits of an education in the arts;
- Renovating art and music spaces;
- Participatory design;
- Usability testing with children

In the following section, we address the psychological implications of being an orphan. These implications stem from the lack of a true parental structure, and may result in feelings of depression that can stem from abandonment. Our research guided us as we explored the design of a creative space with numerous benefits. These include self-expression, therapeutic aspects, and correlations to academic success.

2.1 PSYCHOLOGICAL IMPLICATIONS OF BEING AN ORPHAN

Many orphans may suffer from feelings of abandonment and need a system to help them cope with these feelings. We cannot determine if the boys at the Rita Zniber Foundation suffer from the implications discussed in this section. However, it is a concern of the Foundation Director, Madame Ouafae and must be noted. Lancer (2012) suggests that when a primary caretaker is not attuned to the needs of a child, or is not available for emotional support, the child may feel emotionally abandoned. Foundation Director Madame Ouafae has noted that the children themselves still struggle to understand why they don't have a mother or father, why they were abandoned, and why no one wants to adopt them. Whetten (2011) found that "Abandoned children, …[are]… at high risk for further potentially traumatic events and associated

difficulties, demonstrating the need for ... protection and care and appropriate psychological services" (p. 8). Childhood traumatic experiences have been associated, in many studies, with depression, antisocial behavioral patterns, and anxiety; all lasting into adulthood (Matshalaga & Powell, 2002 and Johnson, 1999). This high risk demonstrates the need for some sort of psychological release for the boys at the Foundation. We were not in a position to implement such a service, but art/music therapy, in which group interaction is present may be one solution to depression and antisocial behaviors (discussed in Sections 2.2 and 2.3). We hope the spaces created provide an opportunity for this service to be launched, but art/music therapy is not the primary focus of this project.

Children at the Zniber Foundation may have to deal with these issues, which puts them at risk for depression and all of the negative side effects that come with it. Elsevier (2012) found a connection between depression that can lead to emotional scarring and inhibited brain growth. Depression Resource Center (2013) includes lack of socializing with peers and difficulty concentrating as symptoms of depression. These symptoms contribute to a lack of social skills and underdeveloped education, both of which are essential to a successful life.

The boys may be at risk for other problems too. Many orphans struggle with a number of social issues that form early in life. These stem from the lack of a true parental structure, which is defined as two parents providing responsive care. According to the Morocco News Board (2012), 80% of the children who remain in orphanages throughout their childhood will become criminal offenders and 10% of them will commit suicide" (n.p). Another study, Pollak (2010), found that orphans raised in a conventional orphanage system are at risk for a lower IQ than children in different family settings of the same age. Nelson (2007) found, "Children reared in institutions showed greatly diminished intellectual performance (borderline mental retardation)

relative to children reared in their families of origin" (p. 1940). In the group setting of the orphanage, children may not get the same responsive attention as from a primary caretaker. These studies suggest that the boys at the Rita Zniber Foundation could be behind intellectually, and therefore have a higher propensity to drop out of school.

A creative outlet may alleviate suppressed anxiety or depression as well as other minor social issues. Goldberg (2012) mentioned the following about how creative expression can help alleviate depression, "The act of expressing yourself, of creating something original that comes out of your feelings or mood -- can be satisfying in itself" (n.p.). Grant (2012) gives a potential way to alleviate anxiety symptoms by finding a good creative outlet (n.p.). Many of the boys at the Foundation have not received any sort of formal art or music instruction, and by no means are all of them going to be gifted artists. But the mere act of creating may assist them in coping with the different psychological effects stemming from being orphaned. Our study did not solve this problem at its root. But aimed to alleviate the symptoms with the implementation of a space dedicated to art and music creation. It is important to note that the emotional struggles abandoned children face stem from deeper reasoning, and this single outlet may not be enough to properly cope. In the following three sections we explore how art and music therapy, as well as an arts education program may serve as a creative outlet, possibly alleviating these psychological implications.

2.2 ART THERAPY

The implementation of a room that can utilize art in a therapeutic manner could help alleviate some of the symptoms discussed above with the boys at the Foundation. British Association of Art Therapists (2011) defines art therapy as "a form of psychotherapy that uses art media as its primary mode of communication" (n.p.) This type of therapy has the potential to treat psychological ailments such as depression, and anxiety as well as other minor psychological issues. A personal account from Art Psychotherapy explains art expression as, "A journey into myself" (p. 6). Leyland, (2009) showed how art therapy can help siblings with shared experiences bond together and help them express feelings of grief and loss. Some of these symptoms are found among orphans struggling with being abandoned. The boys at the Foundation do not appear to suffer from depression but may feel grief or loss.

Within the text of this paper, the term "therapy", should be understood as "an outlet for nonverbal expression", unless used in the context of a literature review regarding professional therapy. Due to the time and financial constraints on this project, we could not hire a professional therapist in time for the completion of this paper. We attempted to replicate some of the methods discussed in the literature review during our project.

Studies show that through art therapy children can express feelings that they have trouble expressing verbally. Meshcheryakova (2012) states, "The art therapy space, which is understood as the child's process of relating to the art therapist and art materials, can offer a safe and reliable territory for the reenactment of traumatic themes" (p. 58). This also pertains to the general communication between a patient and art therapist. Helping the children express themselves well is a key step in their development and is crucial for them to have healthy minds. Providing a safe

environment for this creative expression is very important to begin any healing that could stem from art therapy.

An art therapist may play an integral part in the growth and development of the orphans' expression through art. In a study with Russian orphans, Meshcheryakova (2012), suggests that, "the art therapist assumes the role of a supporter of the child's creative process and growing ability to utilize art in relating and supporting the self" (p. 58). By taking on this role in the child's life, a therapist can also play an integral part in the development of the child's personal skills. Ford-Martian (2011) states, "The 'analysis' of the artwork produced in art therapy typically allows patients to gain some level of insight into their feelings and lets them to work through …[social]… issues in a constructive manner" (n.p.). Previous research suggests that the act of creating art can have a potential therapeutic effect. However, having a dedicated specialist in the room to facilitate the expression greatly increases the psychological benefits. The boys at the Foundation may greatly benefit from expression facilitated by a therapist.

Art therapy is also equally effective for patients of any age. Malchiodi (2006) found that more and more therapists are turning to expressive therapies for patients of all ages. This research gave us the ability to open the room to all age groups found in the orphanage. Casper (1996) shows, a patient's age merely changes the approach to the art therapy method. This primarily manifests itself in the specific medium the individual patient chooses to use. Therefore, an art therapy program at the Foundation should not target a specific age group, but should provide a plethora of media for the boys to use to best express themselves. Allowing them the proper material to express themselves will increase the chances that the art therapy will be beneficial to each individual student.

Other media of creative expression have also been incorporated into a therapeutic setting. Music therapy in particular has become popular in recent years. The next section will detail the literature we found on music therapy and its relevance to our project.

2.3 MUSIC THERAPY

Music Therapy has been shown to help children cope with issues of depression and self-expression, but can help alleviate minor psychological issues as well. Erkkilä (2011), states "Music therapy has … been found to be effective in the treatment of depression" (p. 132). Bunt (1994), tells the story of a girl named Julia, a girl with severe language and speech problems. The music therapist focused on getting Julia to be comfortable initiating her own musical patterns and found that the therapy helped her become "musically and personally more expressive" (p. 106). Tervo (2001) insists that, "Adolescent music therapy aims to promote adolescent growth and development" (p. 90). If we could replicate these successes with the boys at the Zniber Foundation it could be potentially therapeutic for them in helping them deal with any psychological issues present.

Music therapy provides an outlet for people to form a community and bond together through playing. In fact this is one of the main ways that music therapy functions. Bunt (1994) describes the goals of music therapy to "Make contact with another human being through music" (p. 6). Sinclair (2012) presents art or music as a beneficial communication medium for children or adults who prefer nonverbal forms of communication (n.p.). Tervo (2001) found that adolescents playing the music they enjoy together can help them form a bond, while translating their feelings onto their instruments (pp. 89-90). We observed, in our visits to the Zniber Foundation, that the boys already have a love for music and playing music together.

Bunt (1994) gives a case study showing music therapy at work. The study involves two boys, Robert and Julian, who both had speech problems and were referred to music therapy as a result. After the sessions, Robert, whose problem stemmed from immature speech, "was clearly now able to accept Julian's needs, listening more, sharing and turn-taking" (p. 109). Julian, whose problem stemmed from delayed speech and a serious stammer "began to bring issues that were worrying him to the sessions and was able to verbalize about them" (p. 109). These small scale examples could be applied in a broader sense at the Foundation with boys afflicted by lesser psychological ailments.

The following case study also shows that therapeutic work can develop from individual therapy, to pairing together, to small group work. Davies (2008) studied of a four person musical therapy group. It found that "non-directive children's groups have a great deal to offer in this area of child and adolescent mental health and can be the treatment of choice for some children" (p. 214). This is further evidence that children who do music therapy in a group setting can learn a lot about themselves and figure out how to better interact with others. In addition, group musical therapy seems to be enjoyed by the children who participate. Assuming the boys at the Zniber Foundation also enjoy group music, a group musical therapy setting would be a good environment to help the children express themselves.

Now that we have explored the literature of the proposed therapy methods, we now turn our attention to the space in which the therapy is conducted. As equally as important as the therapy, a proper space must be constructed in order to make the therapy most effective. In the following section the necessary design points that must be addressed will be highlighted in order to create the most effective art and music therapy spaces.

2.4 BENEFITS OF AN EDUCATION IN THE ARTS

Studies show that exposing students to an arts education can produce academic and mental health benefits. Eisner (1991) came up with six key findings which detail where the arts play a critical role in school (n.p.):

- Arts can foster the development of students who are actively engaged in learning;
- Arts contribute to the development of a creative, committed, and exciting school culture of teachers, students, and parents;
- Arts can help generate a dynamic, coordinated, and cohesive curriculum;
- Arts can build bridges to the larger community, to the broader culture, and to other institutions;
- Arts can humanize the learning environment;
- Arts contribute to improved academic performance.

Other research has shown additional benefits to an education in the arts. Krash (1954) argues that there are many ways to describe the state of being human, and that an artistic education can teach us how to be intelligent about being human. Boyes (2012) studied the benefits of art in education and found that they are very useful in "raising education standards via the increased motivation, confidence and transferable cognitive skills within groups of pupils that are frequently cited as participation outcomes" (n.p.). The boys at the Foundation could greatly benefit from these increased education standards (See Section 2.1 Psychological Implications of Being an Orphan).

In addition to a space for the arts, a space for the boys to receive a proper music education may help them expand their minds and potentially improve in school. Johnson (2006) showed that elementary students with a proper music education score about 22% higher in

English and about 20% higher in Math sections of standardized tests. Schellenberg (2004) showed that children who receive music lessons over time develop a measurably higher IQ than those who don't. In another study, Church (2001) stated, "Neurological research has found that music enhances brain functions." This increased brain function has the potential to benefit the boys especially academically. This may allow them to see themselves in the future, past the life at the Foundation, and to further understand their situation and begin to cope with it.

A musical education has also been linked to better social skills, memory skills, and an increase in overall creativity. Hallam (2001) showed that a strong musical education can also play a strong role in personal and social development. It showed that playing an instrument can lead to a sense of achievement and an improvement in self-esteem, as well as persistence in overcoming frustrations when practicing becomes difficult (p. 2). These are great attributes especially for the boys at the Foundation because of the family setbacks they may have faced and the challenges they may have to overcome on a daily basis.

An education in the arts has been shown to have many valuable benefits, both inside and outside of the classroom. It can enhance the human brain, helping it perform better, and lead to better results in school. Since orphans tend to do worse in school than children with parents (See Section 2.1 Psychological Implications of Being an Orphan), a strong education is especially important to their development. If the art and music rooms are utilized as planned, the boys at the Zniber Foundation could possibly reap some of the benefits given above. This could then lead to them doing better in school. They could also gain increased social comfort and be potentially motivated to continue in their schooling in order to better their futures.

From this research we conclude that preparing a space where the boys can learn about music has the potential to yield positive academic benefits. Since it is likely that the boys are not exposed to the arts and music in school, this space would be a valuable asset at the Foundation. We now look into the theory behind the renovation of the spaces. The next section covers the technical aspects of room construction.

2.5 RENOVATING ART AND MUSIC SPACES FOR CREATIVE EXPRESSION

Optimizing these factors in the room may lead to the best possible results from the rooms. According to literature, there are important factors when designing art and music rooms. Mainly these are;

- color of the walls;
- maximum occupancy;
- acoustics; and
- lighting.

These will be discussed further in this section. (Daggett, 2008 and Tanner, 2000 and Geisler-Moroder, 2009 and Acoustical Society of America, 2001) Each of these components of each room will play a role in the ability to create expressive pieces of art. Most factors of the room design were completed, but we had to accept that some are not possible with the funds and materials available to us.

2.5.1 IMPORTANCE OF ROOM COLOR

The color that a room is painted goes a long way in setting the mood for that room. Color has also been shown to affect creativity. Daggett (2008) argued that a proper color in a learning environment can create an unthreatening environment that avoids monotony. Daggett further states that young children are attracted to warm bright colors, and as they grow older, their preferences change toward cooler darker colors. The boys at the Foundation will be freer to express their inner thoughts if the aesthetics of their surroundings are kept pleasant. Therefore a color must be selected that would satisfy the range of ages found at the Foundation. Other factors, such as colors that stimulate learning or colors that are universally acceptable will be taken into consideration as well.

2.5.2 MAXIMUM OCCUPANCY IN ART AND MUSIC EDUCATIONAL SETTINGS

Determining the capacity of the room requires a tradeoff between getting as many people in the room as possible, while making sure that there is enough space for everyone using the room. Tanner (2000) states "No one has completed definitive research on the relationship of distance among students and the amount of learning that takes place in defined spaces. One thing's for certain, crowding is a negative factor for student outcomes" (n.p.). The Virginia Department of Education (2010) specifies a minimum requirement of 20 square feet per student for a band room, and 45 square feet for an art room (p. 15). Significant space for creative efforts is important to the boys' expression so every effort should be made not to crowd the area. The Virginia Department of Education for example, puts requirements in place to avoid overcrowding in their classrooms (p. 15). These requirements reflect the different nature of the art and music rooms. The rooms should be designed with these requirements in mind to avoid overcrowding.

2.5.3 LIGHTING SPECIFICATIONS IMPORTANT IN ART ROOMS

Lighting is another important factor to consider in room planning especially in the art room. The color rendering index (CRI) of lights is important to think about when designing a room to be used in creativity and education. Position of the light fixtures is also something to take into consideration especially in an art room. In this section we will discuss the lighting possibilities available to us in this case.

Color of light is important in creating art. Geisler-Moroder (2009) states that the nature of light, or the ability for a light source to reproduce daylight, is important in art because the perception of material color can change based on the type of illumination. Two different types of light bulbs are readily available today, incandescent and compact fluorescent. Prokopenko (2013) states that incandescent bulbs are the older, more traditional light source, and that they give off light with a yellow tint. It also states that compact fluorescent lights are a more recent invention, they last longer than incandescent lights and do not give off the yellow tint (n.p.). Thorton (1972) gives a perfect color rendering index (CRI) of 100 to the sun (p. 1078). Schadler (2012) suggests that an artificial light source with a CRI closest to perfect (100) is ideal for revealing colors in their most expected hues (n.p.).

It is necessary for the boys to have good lighting conditions for painting so their art comes out exactly the way they expect it to. For example, if light blue represents sadness, and the color looks light blue in the art room but is actually light purple, in natural/perfect lighting, the artist may be disappointed and discard his work, for it would not truly represent his feelings. Compact fluorescent lighting seems to be the preferred style of lighting for an art room because of its closeness to 100 CRI and its low cost.

2.5.4 ACOUSTIC SPECIFICATIONS FOR MUSIC ROOMS

Quality acoustics are important for the music room. According to the Acoustical Society of America (2001), "There is no single, all-encompassing set of criteria that will yield 'good acoustics' for all rooms and uses" (n.p.). The ASA also states that the most effective way to reduce sound reverberation is to use absorbers in the room. For example: foam board. The room chosen for the music space has a lot of sound reverberation causing echo. To allow the best space for expression, the students should be able to hear clearly, the pieces they are playing. Freiheit (2000) states that, "The size, shape and surface materials of a rehearsal area all play key roles in defining the acoustics of the space" (p. 3). A rectangle is a good shape for a music room because the walls are large and reflective. The room we are working with is a rectangle which makes it better acoustically than a square room.

Freiheit (2000) also notes that walls made of "concrete ... or other flat reflective materials" will have to be treated with sound "diffusive and absorptive" materials (p.4). The room we are working with is concrete and will have to be treated accordingly. This process includes introducing sound absorptive materials into the room until the echo is decreased. A ceiling lower than 10 feet from the ground, is noted by Freiheit (2000), to "make proper diffusion and the resulting ensemble impossible to achieve" (p.5), and other areas should be examined as more proper for a music room. Unfortunately, we did not have the luxury of another room to choose from, so even though the room has a height of approximately 8 ft., we had to make it work.

Concluding the design points that need to be considered in the room's preliminary design, we must now explore how to populate the room. Because we are not the end users of the room, the design model must take into account the needs and desires of the users. Therefore, we

decided to use a participatory design model to complete this portion of the process. The specifics of this method are explored in the following section.

2.6 PARTICIPATORY DESIGN DIRECTLY INVOLVING THE END USERS

Participatory Design is an approach attempting to actively involve all stakeholders in the design process in order to help ensure the product designed meets their needs and is useable. Kolko (2012), outlines when a participatory design process is best used. It can give a deeper meaning to users' "priorities, and the things they value. The method can be particularly useful in contexts that are hard to observe, such as things that are private, culturally sensitive, [or] infrequent" (n.p.).

Demirbilek (2004) designed a model for a participatory design study which combines participant input with general research by the designers. The study recommends consulting the participants to understand their requirements for room design and utilizing their own research for technical concerns. Alborzi (2000) designed Story Rooms using participatory design as a key step in the design process. Alborzi found that when using children as designers, it was crucial to have a large supply of materials for them to interact with and to reward the children for their participation (p. 95).

This is paramount for the design of the room as the designers are not the end users of the rooms. In fact, the designers are from a completely different culture and must remain sensitive to any cultural differences that may be apparent in room design. Participatory design therefore, was used to help the designers understand the culture at the Zniber Foundation. The children were consulted to determine what they want in the room. This included musical instruments and art supplies, as well as the design for room layout with furniture. The process involved multiple

methods for the children to express what they want, verbally and nonverbally. This process ensured that the room design reflects the culture of Morocco, and fulfills the wants and needs of the boys at the Foundation.

2.7 USABILITY TESTING WITH CHILDREN

Usability testing is important to foresee the frequency and ways a product will be used. A well-used source for usability testing, Rubin (2008), states that usability testing can answer questions on usefulness, efficiency, effectiveness, and user satisfaction of a product. This handbook outlines the process of usability testing. The first step was to propose goals and objectives of the test. Then we needed to state precise research questions, outline a method, and collect data. The steps had been modified based on our need. Hanna, Risden & Alexander (1997) studied usability testing with children, and determined that there are three age groups to consider planning for. Preschoolers (age 2-5), should work at their own pace and be allowed to explore their own interests. They require close behavioral observation to evaluate appeal or engagement. Elementary Schoolers (age 6-10), are easier to include in usability testing. They are not as self-conscious about being observed, and are more articulate in describing what they see and do. Middle Schoolers (age 11-14), are very easy to include in testing. They can be expected to complete, and enjoy, very specific tasks. Some may be able to "think aloud" during a session to articulate their feelings. Children older than 14 should be treated like adults in a usability design study. This was the best way to test the usefulness, efficiency, and effectiveness of the art and music rooms. It required very little communication which helps with the language barrier. It also allowed for modifications to be made between sessions, and results in a quick set of data. This method, as well as surveys and interviews were used in receiving feedback about the room design.

With the key material now reviewed, we now move to the specific implications of this material to the goals at hand. Namely, the technical and design process for the particular rooms at the Foundation; followed by the implementation plan for both rooms, finishing with our overall findings and recommendations for future work at the Foundation.

CHAPTER 3: TECHNICAL AND PARTICIPATORY DESIGN PROCESSES

In this chapter we explore the technical and participatory design process we utilized in renovating the two spaces at the Rita Zniber Foundation. We then further discuss the results that we collected as an outcome of these methods. One of the technical guidelines we paid attention to is occupancy standards suggested by research. In an attempt to create the best possible atmosphere, we looked into the color choices available for each of the rooms. Following this we explored the proper utilities and services that need to be present in order for the rooms to be a success. Specifically for the music room, we researched possible solutions to the poor acoustic environment present in the room. Another concern we had for the rooms was storage. Since we started with empty rooms we had the opportunity to implement a new and effective storage system for them.

After we researched technical aspects of the design, we moved to the physical design of the rooms. For this we utilized a participatory design method, which takes the end users of the space, and puts them at the forefront of the design process. We began this by having a sampling of users complete a series of tasks. This helped us gain multiple view points, as to better assist us in the final design options presented to the Foundation Director. First was a conceptual model—a physical task the users completed—to show how they would optimally set up each of the rooms. Next the users created an image of themselves creating art or playing music. This would have allowed us to see how they viewed themselves, and give us insight as to what materials they saw themselves using in the rooms. Lastly, we interviewed each user to determine what opinions they had on different design aspects or physical pieces in the room (guitars vs. pianos, paint vs. markers). From the collected data, we extracted common themes from across the sampling, and

presented three design options to the Foundation director for final selection and alteration. Through the utilization of this method the rooms will be more attractive to the users at the Foundation, and will be used often to allow for potential benefit.

3.1 TECHNICAL GUIDELINES FOLLOWED IN DESIGNING ART AND MUSIC ROOMS

We researched technical aspects of the design to ensure a proper learning environment. These design aspects are;

- Lighting;
- Wall colors;
- Utilities;
- Maximum occupancy;
- Acoustics;
- Storage.

We researched the design requirements for American school districts and the Royal Swedish Academy of Music. In addition, we studied the physical properties of sound and took advice from professional artists and musicians online. We believe that a firm understanding of the technical aspects of art and music rooms in other parts of the world is useful in the design of the spaces in Meknes.

3.1.1 MAXIMUM OCCUPANCY STANDARDS AND IMPORTANCE IN ARTISTIC SETTINGS

A major part of maximizing the efficiency of the studios is determining how many people the room will hold, while still providing the maximum effect on each person in the room. Tanner (2000) states “What we may comfortably conclude is that no one has completed definitive research on the relationship of distance among students and the amount of learning that takes

place in defined spaces. One thing's for certain, over-crowding is a negative factor for student outcomes." Wohlwill (1985) states, "[It] appears as though the consequences of high density conditions that involve either too many children or too little space are: excess levels of stimulation, and arousal" (p. 108) Significant space for creative efforts is important to the users' expression so every effort was made not to crowd the area. By choosing a defined amount of users allowed in the room at a time we were able to prevent congestion in the workspaces.

The current size of both rooms is 7.3m X 3.3m. This is approximately 24 m^2. Although the Foundation has over 200 boys that could use the rooms, we as a team have set the limit of eight to ten students at a time. This number allows approximately $3m^2$ per artist or musician. We have selected this so not to crowd the room as research suggests.

3.1.2 REASONING BEHIND THE COLOR CHOICE FOR MUSIC AND ART ROOMS

FIGURE 3: PAINTED ROOMS

Color choice is important to the design of the rooms as different colors invoke different psychological responses from humans. Daggett (2008) argues that a proper color in a learning environment can create an unthreatening environment that still avoids monotony.

We did not want the users to be bored or distracted, so we chose one good color for each room. Wright (2008), gives an overview of the different psychological responses to different

room colors. The aim of the room is to provide a safe environment for creation and expression as learning, so psychological responses of colors matter (n.p.). Pytel (2006), states that the color green (see Figure 3 above) inspires creativity, and that the perfect color for an art room is green (n.p.). Furthermore, Wright (2008) explains that green is also the only color that requires no adjustment for the human eye, promoting a more relaxed and restful environment. Selecting the proper color for the room enhanced the overall effect on the students as they utilized the space (n.p.). Green is the color that was selected for the art room because it was deemed as most appropriate in all realms. It gives the psychological response of calmness and creativity which is important for the users to create art, in a safe atmosphere.

Pytel (2006), also states that light yellow is a good general color for classrooms because it is the least irritating color to people (n.p.) (see Figure 3 above). Wright (2008) further points out that yellow is also very stimulating to the brain and invokes feelings of optimism and self-confidence (n.p.). This self-confidence boost from the color yellow could manifest itself in the users' willingness to pick up an instrument and begin to play. Playing music, and learning to play is typically a stressful process which makes the aspects of yellow more pertinent.

3.1.3 PROPER UTILITIES IN ART AND MUSIC ROOMS

Proper lighting in a creative space is necessary in order to maximize the usefulness of the room. Prokopenko (2013) suggests the use of artificial ceiling light fixtures, if natural light is not possible. A ceiling fixture is used as opposed to wall fixtures to minimize the effect of shadows on the creative medium, be it a painting or a piece of music (n.p.). At the Foundation there is minimal natural light available in the rooms allocated for art and music. Therefore, a ceiling fixture was the next best option.

Bartel (2009), states “Typical classrooms have lighting that is too general and uniform.” and that “A visual art learning studio needs direct lighting options and zoned lighting options that can be used when needed” (n.p.). Benya (2004), mentions that track lighting is an optimal source of lighting for artwork stations. It explains that track lights affix to the ceiling but allow movement for a variety of lighting options (p. 148). Incorporating the best lighting situation possible in the rooms will help in the creation of the art and music that will come from both rooms. From this research, the team chose track lighting as the best suitable option for both the art and music rooms. Track lighting allows the users to directly focus the lights on their work, minimizing the creation of shadows.

Including a sink in the design of the art room is an imperative part of the design. Bartel (2009), proposes that sinks are not part of the artistic process, but are necessary in an art room for cleanup. It also suggests having at least two sinks in the art room (n.p.). Three Rivers (n.d) states that sinks are one of the biggest concerns for an art room design. Ideally the room would have four sinks, but one sink will suffice for a simple room. It also said to use auto sinks with electric eyes (pp. 2-5). Though our research suggests that a typical classroom should have two to four sinks, our room should be fine with one due to the small size of the space allotted to us. Auto sinks with electronic eyes are not financially feasible in this situation, so a typical sink faucet will do.

3.1.4 REASONING BEHIND ACOUSTICAL SOLUTIONS

The acoustics of the music room greatly affect the sound produced from the instruments within. With the primary goal of the room being to enhance the sound of music, reducing the amount of echo in the room was important. This proved challenging since the walls are made of concrete. Rosenberg (1981), determined that the shorter the distance of an instrument to a wall or

other reflecting object, the more acute the echo. However, the material of the wall also makes a difference; surfaces like concrete, which is found on the walls currently, reflects sound more than something with porous spaces like a carpet or wall hanging (p. 165).

The Physics Classroom (2013) states,

> "A hard material such as concrete is as dissimilar as can be to the air through which the sound moves; subsequently, most of the sound wave is reflected by the walls and little is absorbed. Walls and ceilings of concert halls are made of softer materials such as fiberglass and acoustic tiles. These materials are more similar to air than concrete and thus have a greater ability to absorb sound. This gives the room more pleasing acoustic properties."

Since the walls are made of concrete, we decided to attach a softer, more porous material to the walls in the room. This material needs to be able to counteract the smooth sound reflecting properties of concrete while being easy to install and cheap to maintain or replace if necessary. We believe that the use of cork would best serve as the sound absorbing material for the music room.

Suberra (2012), points out that corkboard differs from concrete acoustically. Cork is filled with microscopic air pockets, and these air pockets increase the sound dampening properties of cork because the sound waves no longer have a smooth surface to reflect off of. The waves are broken up among the many small pockets of air creating the dampening effect (n.p.). From the research provided, cork shows the most promise across all of these fields. It is dissimilar to concrete and provides the acoustic properties necessary to successfully reduce the amount of echo found in the room. In addition to this, cork is a natural material that is very

cheap, and very easy to maintain, if it becomes damaged. Large quantities of cork can be purchased and set up in the rooms to dampen the echo, making it an optimal material to use, given the conditions in the room.

3.1.5 STORAGE AND POPULATION OF THE MUSIC AND ART ROOMS

An art room needs to have enough storage space to hold all of the rooms' supplies and the projects currently underway in the room. Bartel (2009) states that an art room is a production facility shared by many students, and suggested deep and wide drawer type shelving, along with cabinets along the perimeter of the room (n.p.). Three Rivers (n.d.) identified drawer style cabinets as the ideal storage style for an art room. They also suggest cabinets mounted high on the walls above the tables and warned against cabinets that are too small, observing that papers get folded over (pp. 21-24).

With over 200 users potentially using the art room, (not at all at once) the space needed a lot of supplies for the many projects going on at once. There are many ways to store different materials including shelves, rolling storage drawers, cabinets, and boxes. We have determined that storage space is important, and types of storage will be determined by the users through the participatory design process (See Section 2.6 Participatory Design).

A music room also requires storage space for any sheet music, music books, and smaller instruments. Wagner (n.d), states that if music is to be played in a room, the room should have grill doors to help with the acoustics. However, if the room can be locked, then it is acceptable to have open cabinet storage without doors. He also states that the type and size of storage depends on the instruments needed to be stored (n.p.). Our implementation of storage was especially

important at the Foundation because there are many boys, not all of whom would want to use the same sheet music and instruments.

In addition, a music room, especially the small one used in this case, will inevitably become cluttered without proper storage. This puts the instruments at risk of being damaged. The Foundation does not have the resources to repair or purchase replacement instruments for ones broken unnecessarily. Open storage was more reasonable because of cost. The door of the music room can be locked so this was an acceptable option.

3.2 PARTICIPATORY DESIGN TO INCLUDE THE RITA ZNIBER FOUNDATION COMMUNITY

In this section the participatory design methods that we used will be explored. In order to provide multiple data points for analysis, we utilized three different data collection methods. These methods include;

- conceptual models;
- a drawing exercise;
- interviews;

with the Rita Zniber Foundation Community. Through the use of these different methods we attempted to triangulate our findings in order to present the best possible room design. We hoped this satisfied the majority of the Foundation's population while still serving the needs and wants of Madame Ouafae.

The following verified our idea that including the boys at the Foundation would help us significantly with the design process. Alborzi (2000) states, "children can contribute in significant ways to the design of new spaces for children" (p. 95). This showed us that our plan

to use the end users, in this case, the children at the Foundation, to be the best possible route to take. We saw that children themselves can contribute significantly, compounded with the fact that the children in this case are our end users. This provided us great reasoning to incorporate them into the design process of the rooms.

3.2.1 CONCEPTUAL MODEL CREATED BY THE END USERS OF THE ROOM

By incorporating participants from the Foundation in the design process we were able to design the room closely to their expectations and needs. We used interactive studies, Demirbilek (2004), as well as Kolko (2012) as models for our participatory design process.

Demirbilek (2004), whose subjects were elderly users, states that in the first phase "Participatory design sessions are organized with small groups." Afterwards designs are created "satisfying the requirements and proposals of the …users" and in the second phase, Demirbilek presented modified designs to the users for criticism, modification and comments. "Users could see and perceive the representations of the ideas and the propositions that they had made in the first phase… [after they] ...had been filtered through the knowledge and the interpretation of the designer." We plan to emulate this result in the conceptual models created by our end users. We hope that the rooms will be more usable spaces by satisfying the wants of both our end users and the Foundation director through the above process. This would, in theory, decrease the frustration in using the rooms, which could lend itself to potential benefits.

Kolko (2012) describes how a participatory design process can be used, so that participants "create their own interfaces, products, services or systems." The process involves assembling a toolkit of visual stimuli, having the participants use the stimuli to visualize their ideas, and asking questions about their design afterward. For example, the output from these

sessions “can provide valuable insight into priorities and can motivate strategic design decisions.” Our conceptual model task utilizes a visual stimulus. With this we hope to gain valuable insight from our end users. By accomplishing this we hope to produce design solutions that combine the needs of all the parties involved in the design process.

Following Demirbilek (2004) and Kolko (2012), we developed a process to use for the conceptual design of the rooms. Our process was designed specifically to accommodate our constraints with the language barriers and time. We instructed individual participants to create conceptual models to determine the optimal layout and furniture for the room.

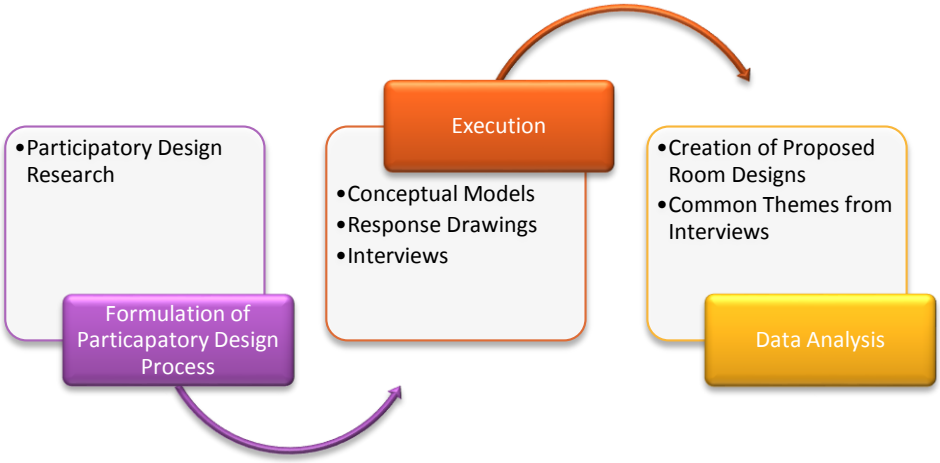

FIGURE 4; PARTICIPATORY DESIGN PROCESS

Three different age ranges were used; each person was given two blank rectangle pieces of paper that represented the rooms as they stood at the time. The room models included the fixed objects in the room and the doorway. Shapes cut out with arabic labels were given to the boys as symbols of different furniture items (chairs, tables, easels etc). They used these shapes to

populate the room as they would want it. This method allowed us to be sure these important items were implemented in some way.

Follow up questions were asked to determine the reasoning for each proposed room design. From the input received, several possible designs were created. These designs were then presented to Mdme. Ouafae for her critique in the second phase. Through this we hoped to optimize the design of the room to satisfy their needs. This active participation yielded the best possible results because it allowed the boys to have a hand in creating the space. Ouafae's assistance in the design process allowed the team to more clearly understand her plans for the rooms and served as the criticism and correction process used in phase two of Demirbilek (2004).

We then presented Madame Ouafae our proposed layouts, designs, and construction plans for the rooms and asked for feedback (See Appendices E and F for designs). Her active participation in the meetings and positive, useful feedback was essential to the design. This was most appropriate because it gave her an active voice in the design of the room, but allowed the boys and us to design the room for her. Participating in the design process should bring the sustainability of the rooms closer to her.

3.2.2 RESPONSE DRAWINGS ILLUSTRATING PREFERENCE OF ART MATERIALS AND MUSICAL INSTRUMENTS

While the conceptual model gave us an idea of the rooms' contents; it specifically lacked an assessment of how the individual views themselves creating art, which is what the Artistic Demonstration aimed to accomplish. Drawing from this task could lead to different results than that of the interviews or conceptual model task. By having multiple methods of data collection,

we aim to have a more complete idea of what the users are hoping for in the creation of the rooms.

We hope to gain further insight into how the users envision themselves in the room through the artistic demonstration. In Demirbilek (2004), subjects were asked to answer questions about a door, specifically the doorknob and then give a concept drawing. These response drawings were then used to construct professional drawings of potential doorknob options. Each knob was slightly different with different features and appealed to a different group of people. Once the drawings were returned further reviews by the participants allowed for a single, best option doorknob. Moraveji et. al (2007) used storyboarding as a means of expression to answer research questions presented to a group of children. The study found that the children more easily answered the research questions artistically rather than using more adult methods, such as brain storming (pp. 1371-1374).

We hoped to gain further insight into the individual needs of each of the users by viewing the participants' artistic interpretation of themselves creating art and music. We hoped this data would help determine the type of supplies that should be present in the art room, paints versus charcoal, or markers versus colored pencils for example. While gaining insight as to the specific medium of the art, by observing what the users depict themselves using in their drawings, we also gained knowledge on what the users were creating their art on; be it a table or easel, on canvas or paper. This type of specific individualized data was used when shaping the contents of the room so as to best fit the needs and wants of the users of the room.

3.2.3 INTERVIEWS TO UNDERSTAND THE USERS' OPINIONS OF THE ROOM DESIGN.

Interviews are a key method for obtaining the opinions of the community in a participatory action design (PAD) process. Daele (2006), describes the interview process as a face to face conversation, with multiple people taking data; one to take minutes and another to record the meeting and fully transcribe it. We recorded and translated afterwards interviews to avoid the difficulty of the language barrier.

Mackay (n.d) states that interviewers who ask open ended questions often get vague answers. She suggests using "Critical Incident Technique", which involves asking questions about specific incidents to get more focused answers. Alternatively, a directed interview, where subjects answer the same questions in the same order, can be used. With language barriers, time constraints, and young age of the participants left the latter as the most feasible option.

Turner (2010), makes several suggestions for developing interviews, recommending open ended, neutral questions that are clearly worded and avoid asking "why" unless really necessary (pp. 757-759). Interviews were a crucial part of this process, because they ensured that we were receiving the users' opinions on the rooms, and it is a direct way to include them in the design process. By selecting a good interview method, and using proper technique, we could ask the right questions and get a good idea of what the users really want. Also, this made the users feel included in the design process, and made the room a much more welcoming place (See Appendix A for interview manuscript).

3.3 RESULTS OF PARTICIPATORY DESIGN

This section details the designs chosen to be implemented as art and music studios at the Rita Zniber Foundation. After conducting seven interviews, conceptual models and artistic demonstrations (see Appendices B, C and D) with community members, we designed three different options for each room that were presented to Madame Ouafae. The designs created were first based on the technical guidelines we established earlier in this chapter through research.We then took into consideration the results of our interviews and conceptual model. For example, the number of users per room remained a constant in all three designs, but the placement of where the users would sit was a variable component based upon interview and conceptual model results.

The design chosen for the art room by Madame Ouafae can be seen in Figure 5 (the two options not chosen can be seen in Appendix E). The availability of a water source limited the area for a sink to the left of the door at the entrance of the room. Storage has been placed along the corners of the walls. Madame Ouafae requested a desk for a proctor be placed in the back of the room. On the left wall when you enter the room, 4 easels have been placed. Opposite of this a table with room for 8 students.

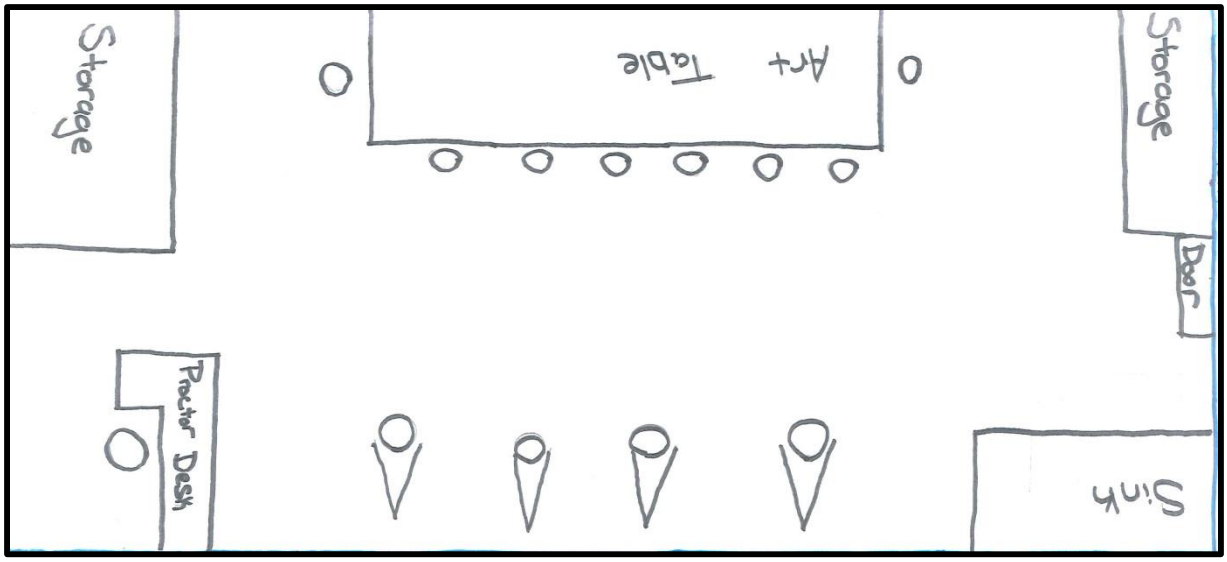

FIGURE 5: ART ROOM DESIGN

The design chosen for the music room can be seen in Figure 6 (the two options not chosen can be seen in Appendix F). The music room has been set up with storage in all four corners and a proctor desk at the front of the room. A table has been set up in the middle of the room with space for ten students to sit around it. Six music chairs with music stands have been placed in front of the proctor desk.

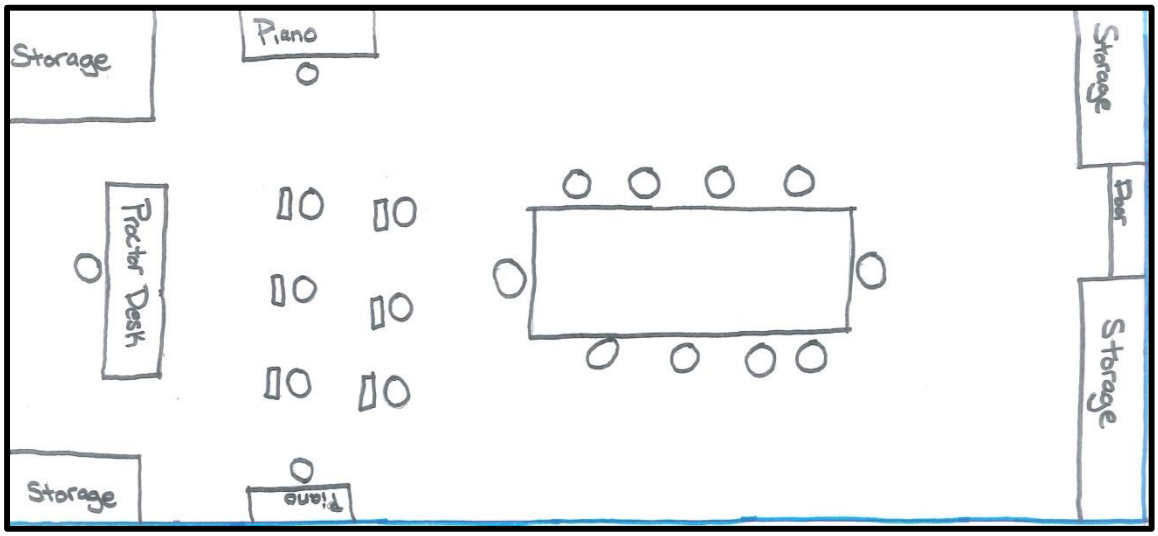

FIGURE 6: MUSIC ROOM DESIGN

Once the design process finished we renovated the rooms into art and music studios. This process is outlined in Appendix G. Following this, we populated the rooms. We visited multiple furniture providers in the area and then presented different furnishing options to Madame Ouafae at varied price ranges based on the designs chosen. Madame Ouafae chose the actual furniture to be purchased and placed in the rooms (Images of the completed rooms can be seen below in Figures 7 & 8). The population of these rooms was made possible through generous donations obtained on a fundraising website established on gofundme.org. A list of donors can be seen in the Acknowledgements section of this report. However, we omitted some of the users' designs because we felt that they were impractical to use. This introduced our bias into the end design, and although necessary, should be noted.

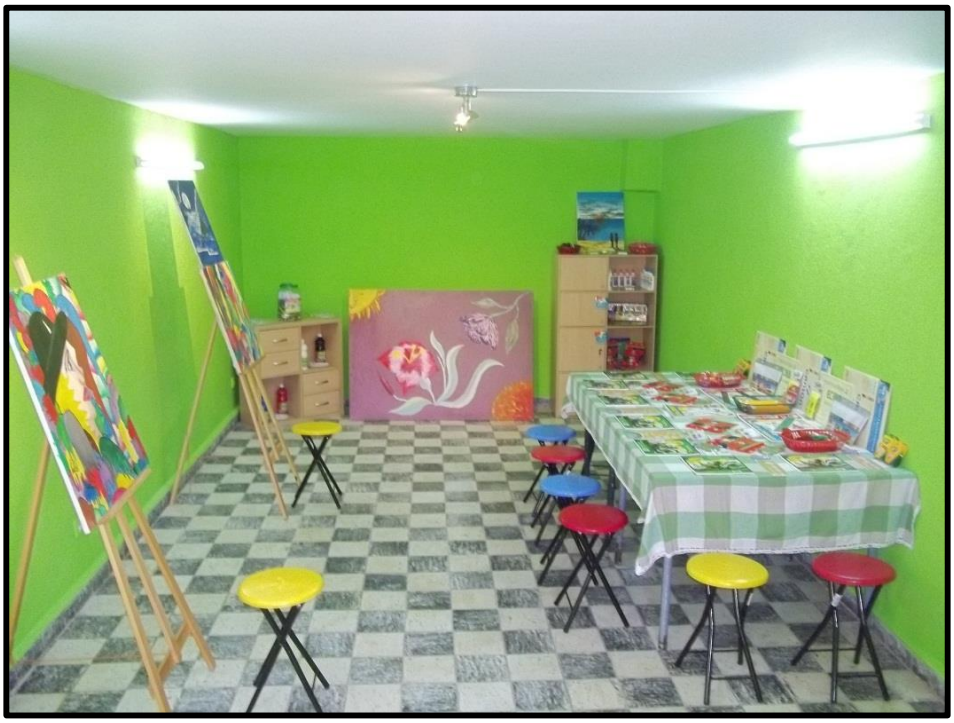

FIGURE 7: COMPLETED ART ROOM

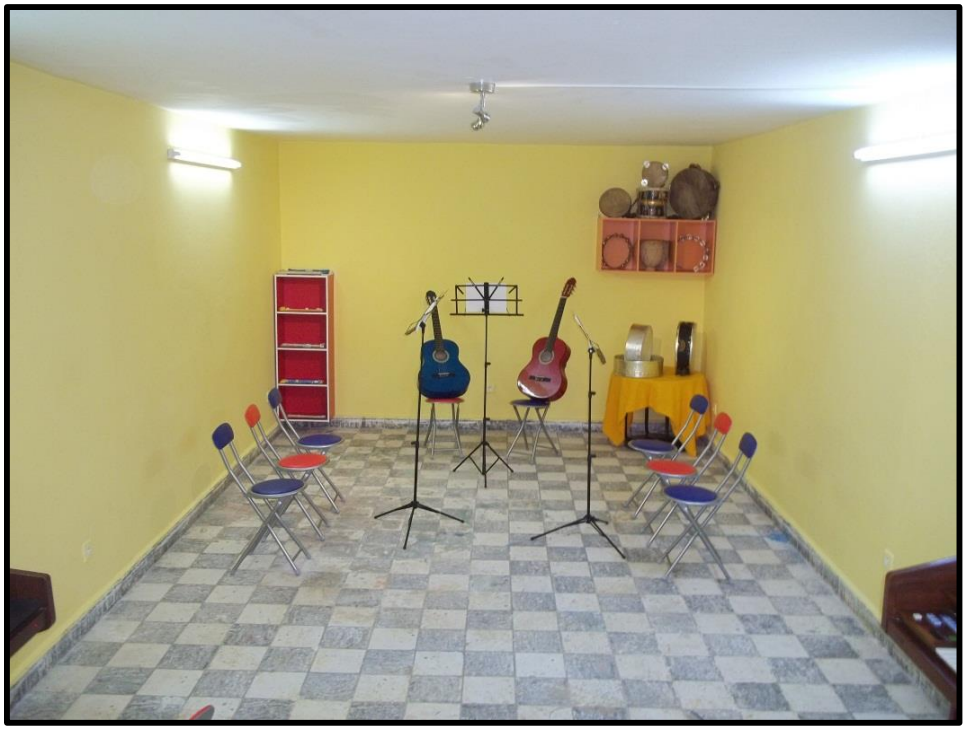

FIGURE 8: COMPLETED MUSIC ROOM

CHAPTER 4: ROOM EXPOSURE AND FEEDBACK

Once the rooms were fully prepared and populated (See Figures 7 & 8 in Chapter 3 for room designs), we moved to assess their functionality through usability testing. You can see the process steps in Figure 9. Although the rooms were created to benefit the users in the areas concerning academic improvement, self-expression, and therapy, we lacked the expertise and time to accurately analyze these benefits in a longitudinal study. Instead, we focused on the usability of the room as it is now set up. Usability in this case is defined as ease of use, and comfort level of the current layout. Rubin (2008) suggests, the more useable a product is, the less frustration, hesitation and questions will arise during the use of it (p. 4). Therefore, the usability of the room directly correlates with the quality of the experience in creation of art and music. Usability testing, in this case, involves exposing groups of users to the room and giving them a broad task. We collected feedback on their experience in the room through observation during use, and surveys both before and after exposure to the room.

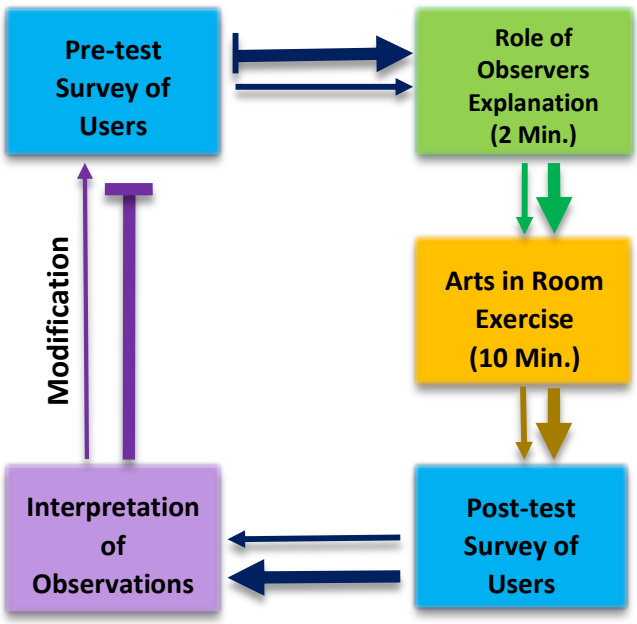

FIGURE 9 USABILITY STUDY

Detailed in this chapter is the specific method that we employed for this study. After first surveying the participants to collect their initial feelings before room use, we moved to the art and music exercises. Upon completion of the various exercises we re-administered the same survey to see if any of the participant's feelings towards the rooms had changed after use. This data interpretation, as well as a discussion of our findings, can be found within this chapter. The process that we utilized to conduct our usability testing with our five groups of users went as follows:

1. Feedback Collection
    a. Pre-test survey
        i. Completed in room
        ii. 1-6 scale
        iii. Questions about instrument/art material preference
    b. Observation upon entry
2. In Room Art Exercise
    a. 2 different art exercises
        i. Draw something
        ii. Create art with any medium
    b. Observation during both
    c. Post-test survey
        i. Same survey as before
        ii. Answering art questions only
3. Groups then switch
4. In Room Music Exercise
    a. 2 different music exercises
        i. Recorder instruction
        ii. Free improvisational session
    b. Observation during both
    c. Post exercise music survey
        i. Same survey as before
        ii. Answering music questions only
5. Data Interpretation
    a. Collection of survey results
        i. See Appendix I
    b. Compiling of observations
        i. See notes in appendix J

4.1 FEEDBACK COLLECTION METHOD

Before running the creative exercises that we carried out with the users, we conducted written surveys with them to understand their initial feelings and expectations of the room. Driscoll (2006) from Purdue University gives a guide for creating good interview and survey questions. She warns against overly wordy questions, any questions that have an assumption built into them, and any double barreled questions (n.p.). We designed our survey questions to obtain the most accurate pre-entry data from each of the participants. The questions asked before the test served as a comparison to the post-test survey, and were used to standardize the data sets. The survey template used can be found below.

On a scale of 1 to 6, one being least likely and 6 most likely please rate the following:

1. Do you like art?
2. How often a week will you use the art room?
3. Do you like that there is an art room?
4. Do you like music?
5. How often a week will you use the art room?

Please choose one of the following from pair:

1. Drawing or Painting
2. Crayons or Paint
3. Markers or Crayons
4. Markers or Pencils
5. Flute or Drums
6. Being Taught of Freestyle
7. Piano or Drums
8. Drums or Guitar?
9. Piano or Flute?

As shown in the interview questions above, a one to six scale was used. This was to avoid any of the surveyed users giving us a neutral answer, which would render the data useless. Furthermore, the questions asked the same thing in various ways. This was done to gain a solid response from the users so that their answers were not tainted by some bias.

Lofgren (2013) recommends ways to reach out to consumers, which in this case, were the boys at the Foundation who would be using the room. His primary way of reaching out to the consumers is the "Direct" approach, talking directly to your client, obtaining immediate and personal feedback from individual users (n.p.). This method, talking with users during exercises through interpreters, allowed the team to obtain immediate feedback on the set up, ease of use and overall impression of the room. Using this collection method also sped up the data collection process which was extremely pertinent to the overall success of the rooms. The faster we obtained and processed feedback the faster improvements could be made to the designs. Within using this method, we have chosen to use a standard set of written survey questions as well as observation and interpreter interaction. (See above for survey questions).

In order to obtain the best information from our users, the best collection methods must be used in order to ensure success. Tashakkori (2003) states that "objective firsthand information" can be best obtained through the use of both observation and questionnaires or interviews (p. 314). We decided to use multiple data collection methods to obtain a diverse set of opinions and reviews of the two rooms, and to allow us to approach any problems that may be present in the rooms in their current state. Therefore, an observation experiment in the rooms was added to our test.

In order to discover the nuances and potential problems with the art and music rooms, we brought groups of 5-6 users into the space and gave them a task to complete. The project team conducted a usability test following guidelines given in Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests (Rubin, 2008). We hoped to gain insight into whether users of different ages could use the room equally, and to perceive any problems with the design before actual implementation of the room. The research questions we aimed to answer were:

- Which supplies are used the most/least, and why?
- Do users prefer music lessons or improvisation?
- How easily do the users learn music?
- What is the comfort level of users in the room?

Our testing procedure worked well because it provided multiple methods to answer these questions. By allowing the users to work in the room, we were able to see firsthand how the users used the rooms, which helped us answer specific questions like how easily they were able to find supplies. In addition, we were able to answer questions about their feelings toward the rooms more precisely by using the surveys, which also gave us insight into their specific interests with the space.

A well-used source for usability testing, Rubin (2008), suggests a group of 4-5 participants to represent 80% of deficiencies in a product. More participants are better, but 4-5 is acceptable (p. 72). In this independent group design study, we divided the participants into 10 groups of five. Five groups tested the art room and five tested the music room. Two activities took place in the music room and two in the art room. Activities are research based and described in depth in the next few paragraphs. Abras (2004) gave a set of principles that should guide a

"User Centered Design" like the one we conducted. One of these is the simplification of tasks, making sure not to overload the memory of participants, allowing them to focus better on the task (p. 3).

Ciotti (2011) mentions other ways to gather customer feedback. One of these ways is "On-Site Activity", this involves careful candid observation of the customers using a product (n.p.). In this case, the "product" is each room as it currently stands. By observing the users interaction with the room we gained a balanced review of the room. This method provided us with immediate feedback to process. It also did not require, nor necessitate much verbal communication between the observers and the users, which eliminated the trouble of a language barrier. If any problems of layout arose during the usage of the room, modifications were made to alleviate the issue.

The users had a wide age range, including some very young children so simplicity was very important for their focus. Cutting the time of the test down to 20 minutes helped with focus. The 20 minutes included pre-test questions, explanation of the roles of the observers, and post-test questions, as well as a 10 minute exercise.

4.2 ARTISTIC EXERCISES

FIGURE 10: USERS COMPLETING ART EXERCISE

We tested art room usability, as you can see above in Figure 10, by having three groups of students draw a picture using drawing materials, and having two groups of students create a picture using anything they wanted in the room.

Klammer (2011) outlines some art exercises that can be carried out individually. The simplest of which being draw whatever you want. It could be based on how you feel, what you're thinking about, anything at all (n.p.). This exercise was most suitable because it allowed the users the most freedom in the room; rather than having them complete a specific exercise that could have altered their experience in the room.

The first three groups were limited to drawing and the last two groups were allowed to use whatever materials they liked, including drawing materials, paints, scissors, various papers, stamps, and any other materials. All groups were allowed to use whatever furniture they wanted to create the art. The users were not asked to create anything specific, just a piece of art,

following the Abras (2004) recommendation of a simple structure (p.3). The users stayed in control during the exercise because they were able to create whatever they wanted.

4.3 MUSICAL EXERCISES

FIGURE 11: USERS COMPLETING MUSICAL EXERCISE

The music room usability was tested by giving three groups of students a music lesson, as you can see in Figure 11, and having two groups of students engage in free improvisation while we observed their interaction with the room. These exercises are based on ideas developed by professional musical therapists and teachers who work with children.

Mead (n.d.), states that the act of reading music notation has a direct correlation to academic achievement, and that it is important for musicians to learn to read sheet music in addition to simply playing music for academic achievement. We used her studies to help design the first task of the experiment.

Wigram (2002), goes into detail describing procedures used by music therapists. The process uses the Alvin Model, utilizing free improvisation as a therapy method. The process

relies completely on listening to or playing music, using every musical instrument available, with no rules set in place by the therapist (pp. 130-134). We used his study to help design the second task of our experiment.

We had the users play together in the music room, hoping to reinforce our findings from the interviews and interactive studies done earlier. We also hoped that this would show us which instruments and which aspects of the room were most popular with the students, and whether or not the students enjoyed playing together in the room. Two tasks were given to a total of five different groups. The first three groups were given a traditional lesson, in which the users were taught how to play 'Hot Cross Buns' on the recorder with sheet music. The last two groups were given the task of free improvisation, where small groups were brought in to freely play music with a leader. These exercises were used to test each rooms' effectiveness for both musical improvisation and music lessons.

After the completion of the exercises with the users, we collected feedback from the participants to analyze their individual experience. We used observation of creative exercises as well as post-test surveys to gather data on the optimization of the rooms' design. The users were given the same survey after the usability study to see if expectations and feelings regarding the rooms had changed.

4.4 INTERPRETATION OF DATA FROM SURVEYS AND OBSERVATIONS IN THE USABILITY STUDY

Interpreting the survey answers was a multistep process which involved compiling, organizing, summarizing, and analyzing the data. Rubin (2008) outlines this process in his handbook, which covers extensive multi-day usability tests. Due to the nature of the IQP, we encountered time constraints and therefore, only tested for 3 hours and did not include all the

suggested procedures. Most notably, it is recommended to complete a 2-4 week "comprehensive analysis" to cover all findings and analyses. Our timeframe did not allow us to complete this type of extensive analysis, and our test is not extensive enough to warrant it.

Rubin (2008) also gives suggestions on compiling data efficiently. With a fast-turnaround test, Rubin suggests constantly compiling data while it is fresh (p. 247). This handbook also suggests organizing data so patterns are easily seen. Using spreadsheets is one of the best ways to do this. The spreadsheet easily provided a visual of the data by organizing it all in one place. We found that these visual representations were helpful in interpreting the observations and surveys. Summarizing the data allowed us to see discrepancies between the sessions.

In a more extensive usability test, we would have recorded all sessions on a video camera so things that were missed during the first observation could be caught during a second viewing. Our test was simple and quick so it did not warrant a second viewing. An interpreter was present at each session to observe and take notes on things spoken between users. They also noted questions they were asked by the users during the test. To more easily see patterns in the data, we entered survey answers, grouped by session exercise, into a spreadsheet to display the change in survey answers before and after the exercises. To calculate performance of the users, we approximated how long it took each session of users to collect the supplies they needed and how far they had gotten in the task in the allotted ten minutes (see Appendix I & J for spreadsheets and observational notes).

4.5 RESULTS & DISCUSSION OF USABILITY STUDY

The community at the Foundation appeared to really enjoy both art and music. In the surveys taken before the exercise, 20/21 of the users gave 6 out of 6 for musical enjoyment, and 15/21 gave 6 out of 6 for artistic enjoyment (see Appendix I for tables of survey data). None of the users gave less than 4 out of 6 for either art or music. After the experiment, 35/48 of the users gave a 5 or a 6 in terms of how much they would use the art or music rooms. The following section discusses the answers to each research question proposed at the beginning of this usability test.

Pencils and markers were the most used supplies in the Art room. Crayons were not popular with the boys.

This is reflected in both surveys and observations. After the experiment, 19/25 users said that they preferred painting even though only one user tried paints during the exercise. In the post-test survey, 18/23 users wrote that they preferred markers and paints to crayons. Users chose paints as their top choice, and for drawing utensils, pencils were the favorite but markers were a close second. The boys at the Foundation seemed to enjoy creating art with materials that are typically seen as more advanced. If a formal program is to be developed in the future, it will be important to know which materials are most preferred by the users.

Drums and Piano were the most preferred supplies in the music room.

During the improvisation session, the drums and the piano, the two loudest instruments, were the most popular. The recorders and harmonicas were barely touched. It should also be noted that the piano and drums were louder, and more familiar to the users than the recorders and

harmonicas. If a formal program is to be developed in the future, it will be important to know which instruments are most preferred by the users.

Users preferred music lessons over free improvisation.

After the experiment, 17/20 of users circled that they preferred music lessons to free improvisation. Results before the experiment were almost identical showing that experiencing a lesson or free improvisation barely influenced the users' opinions. The users overwhelming noted both before and after the experiment that they preferred being taught music to music improvisation. We found that the users enjoy music, but prefer to learn music in a lesson format, rather than discover it by themselves. This has additional benefits, such as teaching the users how to read sheet music and properly play various instruments. These results only emphasize the need for a music teacher.

The users had little to no prior musical instruction.

Through observation of the instructional music sessions a few key points were noticed that remained similar across all the groups:

- The users obviously had no prior musical instruction;
- The time allotted for the instruction was not sufficient to complete the task;
- One instructional period was not enough to properly gain an understanding of the music.

It became clear almost immediately that the users had not received any music instruction prior to this session. The instrument chosen for the exercise, the recorder, is a popular first instrument for many music instructors. It is a simple instrument that does not require any

complex fingerings, which make initial note learning easy. The users had obviously never held or seen a recorder before, they did not know the name for the instrument and initially struggled holding the recorder correctly.

In addition to this, the time allotted for each group (approx. 10 minutes) was not enough for the group to complete the assigned task. Each group was able to clap out the rhythm by the end of the session. However, once that rhythm was moved from hand clapping to recorder, it became difficult for the users to replicate the instructor. While some groups were able to get through one bar (3 notes) of the song, none were able to play the song completely within the given time. One group, which received extra time, (approx. 20 minutes) was able to play through the song once, but in no way was this observed to be mastery of the song.

The users are very comfortable in the room.

Users did not hesitate to get supplies for art or to start playing music after instruction was given. During music and art sessions, users were eager to start the exercise. This suggests that the users were very comfortable in the room. This is important because the more comfortable the users are within the rooms, the more they will be utilized for art and music. It also appeared that the users are interested in using the space frequently after we leave. This is a very promising finding because the users must be interested in the space for them to continue to use it. For the space to have any benefits for the Foundation, it must be frequently used and maintained. These results indicate that the users at the Foundation really enjoy the subjects utilized by the developed spaces.

With the room now completed and final feedback received from the end user audience for the rooms, we now move to conclude all of our findings. The following chapters will highlight

our discoveries, as well as outline any challenges that we faced, and a set of recommendations for future endeavors both with the Rita Zniber Foundation and with projects of a similar setting.

CHAPTER 5: FINDINGS AND DISCUSSION

From the results of our project, we have determined that the rooms developed at the Rita Zniber Foundation have the potential to provide the children with educational, artistic, and therapeutic benefits. This section includes the most important findings we came across during this project to deem the rooms as successfully designed.

Including end users in the design of the room positively affected the usability of each room.

With data provided by the post-test surveys, the users seemed to enjoy the rooms, which we used as an indication of success. Our participatory design process allowed the users at the Foundation to be involved in both the conceptual design and the physical renovation. Our research suggested participatory design as the best model for designing these spaces and we believe that including the users in the design process produced multiple positive effects. User involvement in the conceptual design gave us an insight into their ideas and needs, and allowed us to design the room to meet these needs. User involvement in the physical renovation brought the rooms closer to the boys at the Foundation, and provided us with valuable assistance in all areas of this project.

The design process was successful in coming up with a general consensus on how the rooms should be set up.

When designing the rooms, users always placed storage tucked into the corners and almost always situated students in the middle of the room. The only exceptions were in the un-chosen art room designs, where certain students were facing the back wall painting on the easels. The greatest variation between the designs was the placement of the proctor's desk. Users located the desk in a corner near the door, in a corner on the far side of the room, or placed in the

middle of the room against the back wall. The similarities between these designs indicate that the design process was successful in coming up with a general consensus on how the room should be set up.

Users share excitement about the rooms and the chance to learn art and music.

In the pre-test and post-test surveys, most of the boys gave 6 out of 6 for their enjoyment of art and music. Nobody answered less than a four for either of these questions. After we ran the exercise, users indicated on surveys that they would use the room more frequently. This shows that they had a positive experience in the rooms and with the creative exercise. Users showed excitement during the experiment which makes us optimistic about the future of these rooms. The users' energy suggests that they will continue to use these rooms once we leave. In addition, we think the boys will be receptive if future programs are established in these spaces.

Users strongly preferred having traditional music lessons over free improvisation periods.

After the experiment, 17/20 of the users said that they preferred music lessons over free improvisation. Survey results done before the experiment were almost identical showing that experiencing a lesson or free improvisation barely influenced the users' opinions. McGaffey believes that without any formal education the users may not get anything out of the room, or even try. (Personal communication, October 17, 2013). These results suggest that the music room needs an educational component to it to keep it in use once we leave. For this to happen, a teacher should be utilized to give the students lessons in the music room.

These findings indicate that the boys at the Foundation really enjoy the subjects utilized by the developed spaces. It also appears that the users are interested in using the space frequently after we leave. This is a very promising finding because the users must be interested in the space

for them to continue to use it (We repeat ourselves should we reword). For the space to have any benefits for the Foundation, it must be frequently used and maintained. With the room now completed and final feedback received from the end user audience for the rooms, we now move to make recommendations for future endeavors both with the Rita Zniber Foundation and with projects of a similar setting.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

We will now list our recommendations for future work with the Rita Zniber Foundation's art and music rooms based on the results discussed in the previous chapter. We propose these recommendations to further improve the rooms and maximize their potential benefits for the boys at the Rita Zniber Foundation. Primarily, we recommend next steps for the music and art rooms, then move on to recommendations for future work, and finally conclude with recommendations for future WPI IQP projects in Morocco.

6.1 RECCOMENDATIONS IN NEXT STEPS FOR ART AND MUSIC ROOMS

We obtained observational data and user feedback by evaluating the users as they explored the newly designed art and music rooms during controlled exercises. This data was important, as it allowed us to make recommendations for future changes to the rooms and to come up with ideas for the future usage of the rooms that would benefit the users (see Chapter 5: Findings and Discussion). The data specifically allowed us to make suggestions for modifying the design of the art and music rooms and to provide recommendations for future projects.

We recommend that a usage organization system be developed for the rooms.

In order to optimize the efficiency of both rooms, we recommend that the Foundation develop a system to allow the rooms to be used by groups of 8-10. This system could prevent room overcrowding which could lead to the materials in the room being damaged or not used at all. Maintaining this system would also make sure that everyone who wants to use the rooms has the opportunity to do so, and that the time is evenly distributed among everyone. We based this recommendation mostly on observations of overcrowding during the exercises in the usability studies. During exercises with specific groups of users, other boys would walk in and out of the

rooms, crowding the creative spaces (see Appendix J for usability observations). We also noted, while walking around the Foundation, that the younger boys had a structure to their day, certain rooms were locked, and the younger users were watched at all times during their activities. These observations correlate with the director's insistence on a desk in each room for the person who is responsible.

Furthermore, we have researched the optimal space per student given a room the size of the ones we renovated at the Foundation (see Section 2.5 regarding maximum capacity). Using this research we have determined that no more than 8-10 users at a time should be present in the room during any given session. This allows each of the users the space necessary to properly create art or play music without hindering their experience or that of the other users in the room.

Since the boys are used to being watched by an adult during most activities, we recommend putting an adult in the room to be in charge of the boys. This system fits better with the culture and with the users than a schedule or sign-up sheet for a few reasons. Primarily, this is the system the community at the Foundation is most used to and would therefore be the easiest to adopt. Secondly, some boys may not want to use the room, or would find it inconvenient to sign up for time on a sign-up sheet. In regards to a schedule, many times, especially in this culture, other things take priority over a schedule. When other aspects of life take priority, a user should not have to choose between those aspects and their creative time. By implementing this recommendation as soon as possible the Foundation will be able to fully utilize both rooms to their full current potential.

We recommend implementing a fundraising plan to continue purchasing supplies for the two rooms.

The Foundation may need additional resources to maintain the rooms, and to potentially provide future services using the rooms. Keeping the rooms up and running is a major concern we had when looking into the sustainability of our project. These rooms require supplies to maintain their usefulness to the users. Some supplies need to be replaced regularly, while other supplies will need to be replaced on a case by case basis, such as broken instruments. We renovated the rooms mostly through monetary donations which we exhausted. Because of this, the cost of supplies adds an extra financial burden to the Foundation and will require the Foundation to acquire more funds. Draper (2012) developed a list of general fundraising ideas which the Foundation could use in its day to day business. It provided a business letter and template to use in fundraising, and recommended renting out commercial property and selling crafts or products of a garden.

We now recommend that the Foundation adapt the business letter template specifically to art and music donations, and reach out to groups and companies that have specifically donated to art and music programs in the past. These tactics may best increase their odds of receiving donations. Mr. Holland's Opus Foundation supplies musical instruments to music organizations and The Art Resource Center supplies organizations with art supplies. These are just two examples of organizations the Foundation could reach out to for monetary or donations in-kind.

We recommend that the Foundation further alter the music room to improve the acoustic atmosphere.

As our research has shown, hard smooth surfaces reflect sound and are improper for the acoustics. Currently the walls in the music room are bare and smooth. This, coupled with the fact that they are made of concrete, creates an acoustical environment in which echoes thrive. These echoes negatively affect musical performance as well as the overall sound of the room. Observers experienced this overwhelming sound reverberation during usability tests.

We recommend that the Foundation soundproof the music room and install acoustic soundboards. To quickly soundproof the room, we primarily recommend that the two windows in the room be covered. This could be achieved through the use of foam-board or cork board so sound does not leak out of the room and disturb the neighboring art space. These materials are relatively inexpensive, and able to be removed if needed. The construction of soundboards is also a pressing concern. We recommend that soundboards also be constructed out of cork board and hung in the room. Our research of cork shows that it has great sound reduction properties as the cork is very porous (see Section 2.5 including acoustic specifications), which allows the sound to enter, but not be easily reflected back out in the form of an echo. This allows the original sound to be heard rather than the echo. Also, cork is relatively inexpensive and such a small space requires few boards to achieve the desired result for the music room.

6.2 RECOMMENDATIONS FOR FUTURE WORK

We recommend that future endeavors with the music room be focused on the feasibility and implementation of a music education program.

During the usability study, we found 17/20 users surveyed during the test preferred musical instruction over a free improvisation. Our observations also show that the users have no formal music education, and therefore cannot reap its full benefits. Furthermore, as our background research on music education shows, music rooms require a present and active instruction program with a teacher; or the room is at risk of falling into disuse. Mead (n.d), states that the skill of reading sheet music has been shown to have academic benefits, where as simply playing has not (n.p.).

Usability study observations (see Appendix J) clarify that a teacher or leader is necessary in the music room. Without a leader in the music room, the users struggled at times to cohesively play music together. This is made evident by the fact that during the improvisation session, only the loudest instruments were used. Observers also noted that the more introverted children tended to stay away from the large groups of users while they were playing. This was to be expected from casual observations of musical interaction among the users, and it only emphasizes the need for an instructor or leader in the music room.

We recommend three ways to establish a music education program:

- Solicit volunteers currently studying music education, to serve as music educators;
- Older boys with talent could be given leadership roles by leading music lessons;
- Employees at the Foundation with musical talents and education could teach lessons in their free time.

Each of these recommendations has its benefits. Volunteers currently studying music would gain experience in the field and the boys would benefit from a semi-professional instructor. Older boys, given additional responsibility and leadership roles would help them grow as leaders. Lastly, the boys are used to the employees at the Foundation and may feel more comfortable with instruction from them. These, and other potential benefits need to be examined when determining which mode of instruction to go with.

We recommend implementing a complete art therapy program at the Foundation.

The research conducted in Chapter 2 shows the beneficial aspects of implementing a robust art therapy program. It has the potential to be extremely successful at the Foundation. Many of the boys whom we observed showed an emotional connection to their work. In the response drawings, illustrating preference of art materials and musical instruments, many of the boys ignored the requests of the advisors; instead drawing pictures of houses and families. In addition, we observed during usability testing that the children were proud of their work, showing their work to the interpreters and us (see Appendix J for observation notes). The primary focus of the room, as first envisioned by our sponsor, was the renovation of these spaces for creative expression purposes. Madame Ouafae envisions the room serving a therapeutic value

to the users in the future. By implementing an art therapy program in the room, Madame Ouafae's objective of providing the boys with a therapeutic outlet would be closer to being realized. As the room currently stands there is the potential for therapeutic benefit, however it would be best if a professional therapist was able to work with the boys in the room.

Our research has shown that an art therapist may play an integral role in the growth and development of the boys' expression through art (see Section 2.2 on art therapy). The therapist becomes a creative supporter especially in exploring the inner self and increases the psychological benefits of art. A paid therapist is the best person to fill this role, but funds may not allow a position of this caliber to be filled correctly. The Foundation could possibly find art therapy students to volunteer or intern at the Foundation.

6.3 RECOMMENDATIONS FOR FUTURE WPI IQP PROJECTS

We recommend that a future group take on the project of creating a mentoring program between Al Akhawayn University (AUI) and the Rita Zniber Foundation.

With the absence of parents to provide a mentoring role for the boys, an outside source could be used to fill this role. The mentor could be seen as a role model, motivating the boys to do well and assisting with difficult tasks in school. Many of the boys are interested in attending a university but we have only encountered a few who actually go. Our research supports that orphaned children have a harder time succeeding in school (see Section 2.1 regarding psychological implications of being an orphan), which makes it harder for them to go on to higher education. A mentoring program set up at the Rita Zniber Foundation could have long lasting benefits for the boys there.

We recommend creating this mentoring program through building a relationship between AUI and the Foundation. In speaking with AUI students and telling them about our project, we found that they were interested in visiting the Foundation. This gives us some insight on student interest in this relationship. The community service office, we think, will be the best place to build this relationship. Students at AUI are required to complete 60 hours of community service as part of their degree requirements which creates a need for community service opportunities. A mentoring opportunity could fill this need. Also, this office already runs service programs focusing on donating to orphanages. The mentoring program could easily be added as an extension to Hand in Hand, a service program at the university. As an aside to our project, the Foundation asked us if it would be possible to have some of their boys visit AUI to experience a college campus. In creating a relationship between AUI and the Foundation, this visitation should be included.

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APPENDIX

Table of Contents:

APPENDIX A: PRE-ROOM DESIGN INTERVIEW MANUSCRIPT

1. What is your age?
2. What are your favorite types of art?
3. What type of supplies do you think you need to make art?
4. Draw yourself making art.
5. What type of music do you listen to?
6. Which instrument would you like to play?
7. Draw yourself playing music.
8. What is your favorite musical instrument?
9. Would you like to play music with or without your friends?
10. Are you interested in composing your own music?
11. Are you considering the arts or music as a career?

APPENDIX B: PRE ROOM DESIGN INTERVIEW RESPONSES

Interview #1:

Age: 13

Favorite Types of Art: Trees, Wind (Painting?)

Supplies Needed: Paints, pens, brushes, pencils

What kind of music: Oriental, Popular Moroccan music

Musical Instrument: Piano

Favorite musical instrument: Lute

Wants to play music with friends

Compose music: doesn't know how to

Career in music: Yes, wants to be a painter

Interview #2:

Age: 14

Likes: Music; Popular Music and Hip Hop; Playing Guitar

Need to practice: Guitar

Wants to play with friends

Might compose music

Would like to be a musician

Only likes music

Interview #3:

Age: 9

Likes: Music, Oriental Music,

Supplies Needed: music books, pens, colored pencils, highlighters

Favorite Instruments: Piano, Guitar, Darbouka (Moroccan drums)

Wants to play with friends

Wants to compose

Wants to be famous

Interview #4:

Age: 11

Likes: Music; "Ray" Music

Supplies Needed: Pencil, Eraser to make music

Favorite Instrument: Violin

Wants to play on rooftop

Wants to play with friends

Wants to compose

Wants to be a famous musician

Interview #5:

Age: 6

Likes: Drawing, Music

Supplies Needed: Pencils, Paints, Brushes, Pencil Case

Wants to become a famous painter

Interview #6:

Age: 5

Likes: Music, Islamic Songs

Favorite Instrument: Piano

Wants to play with his friends

Wants to sing about his Mother

Wants to be a musician

Interview #7:

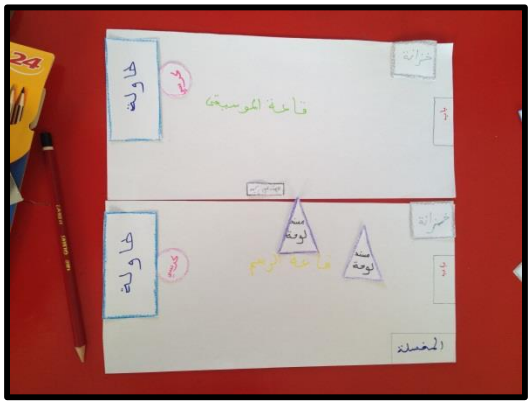
Age: 8

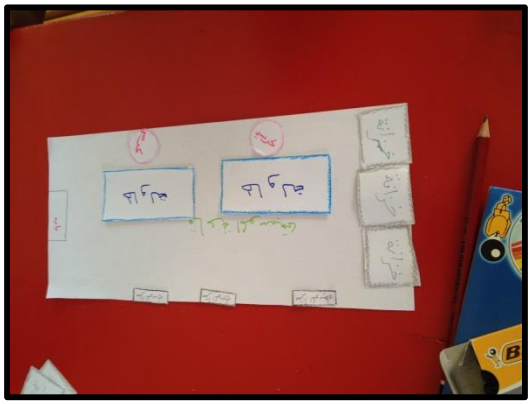
Likes: Drawing, Painting

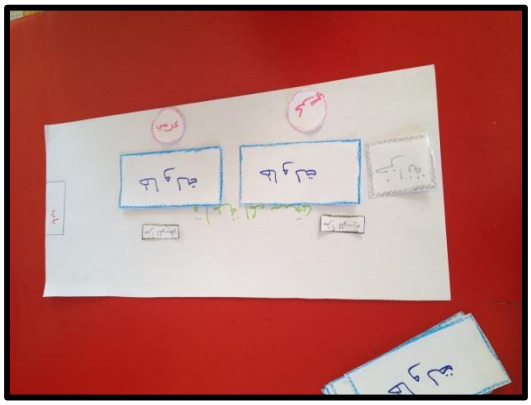
Supplies Needed: Brushes, Pencils, Erasers, Paints

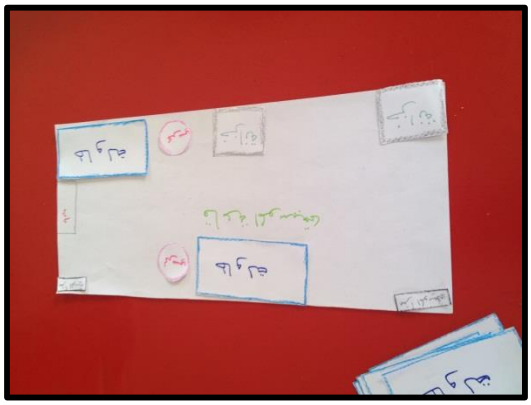
Wants to be a professor

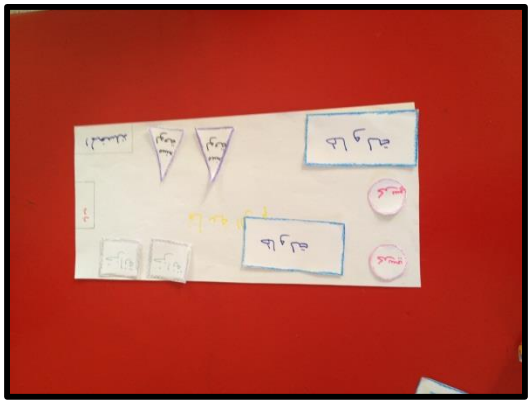
APPENDIX C: CONCEPTUAL MODEL PHOTOS

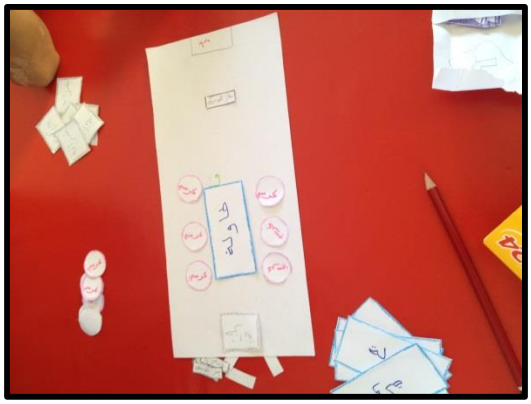




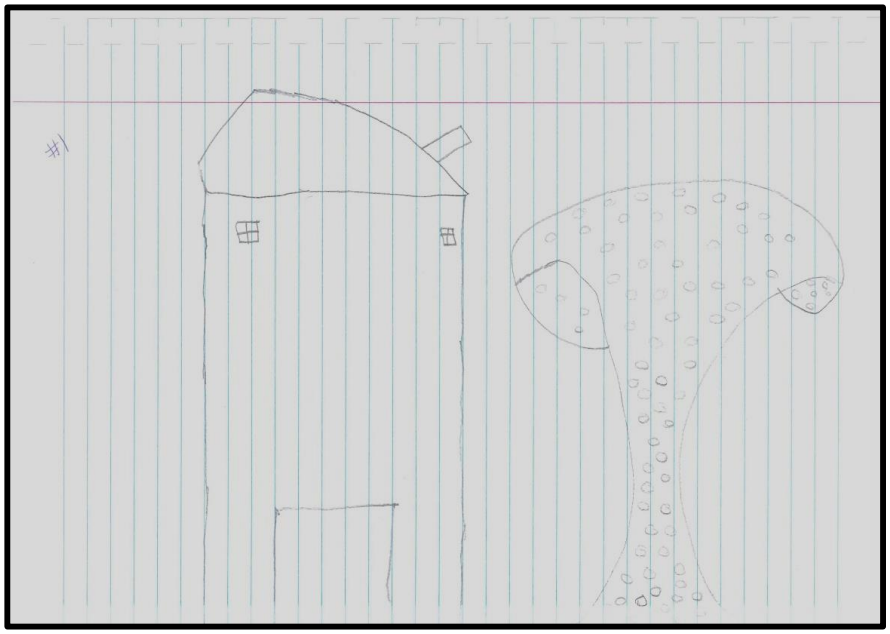


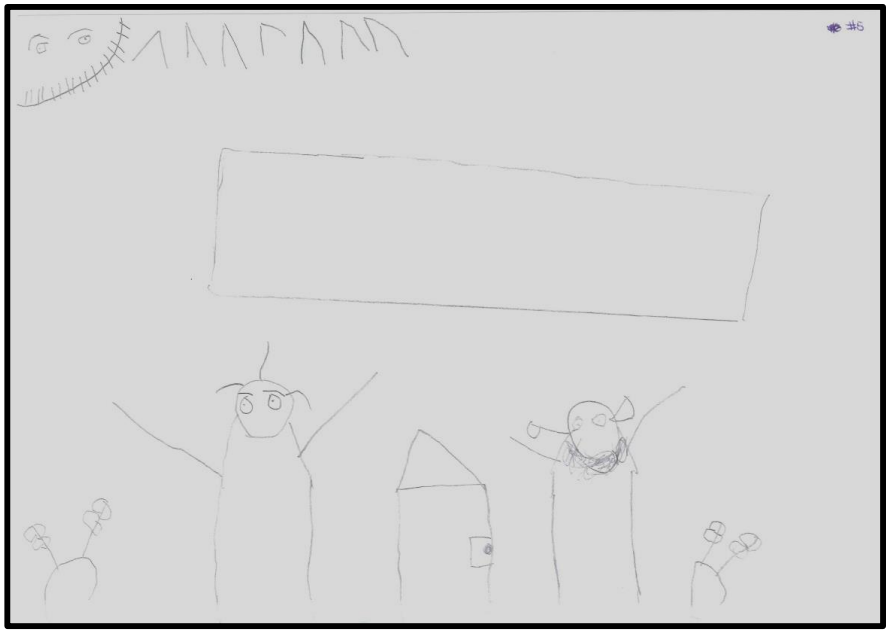




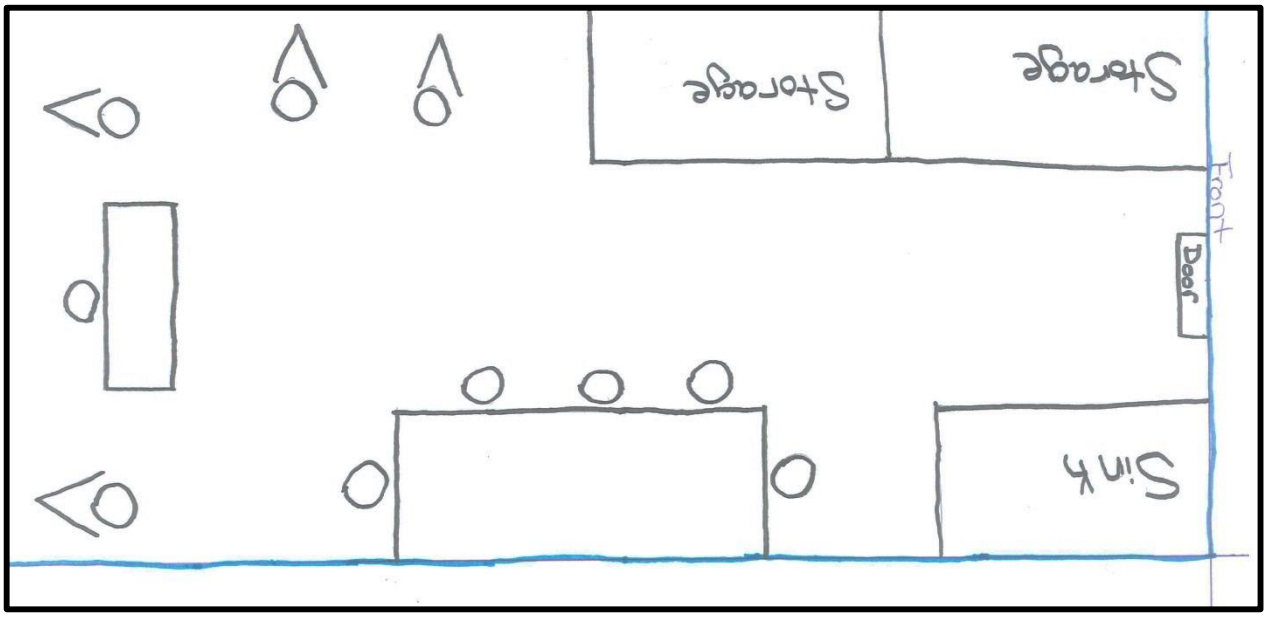


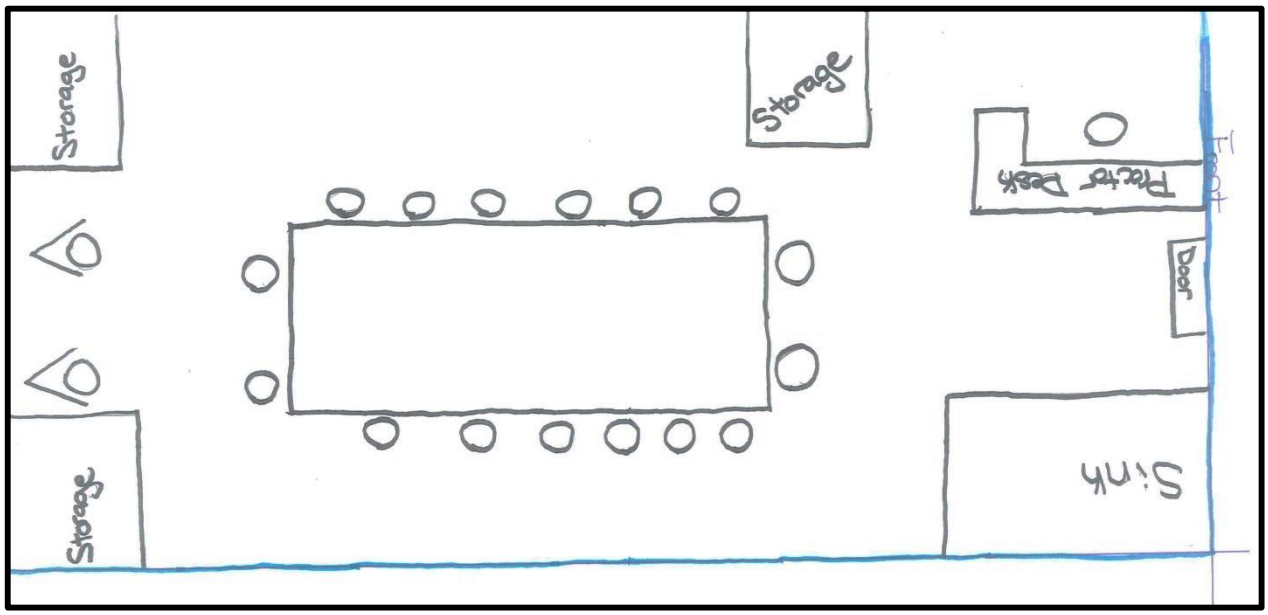
APPENDIX D: ARTISTIC DEMONSTRATIONS PHOTOS



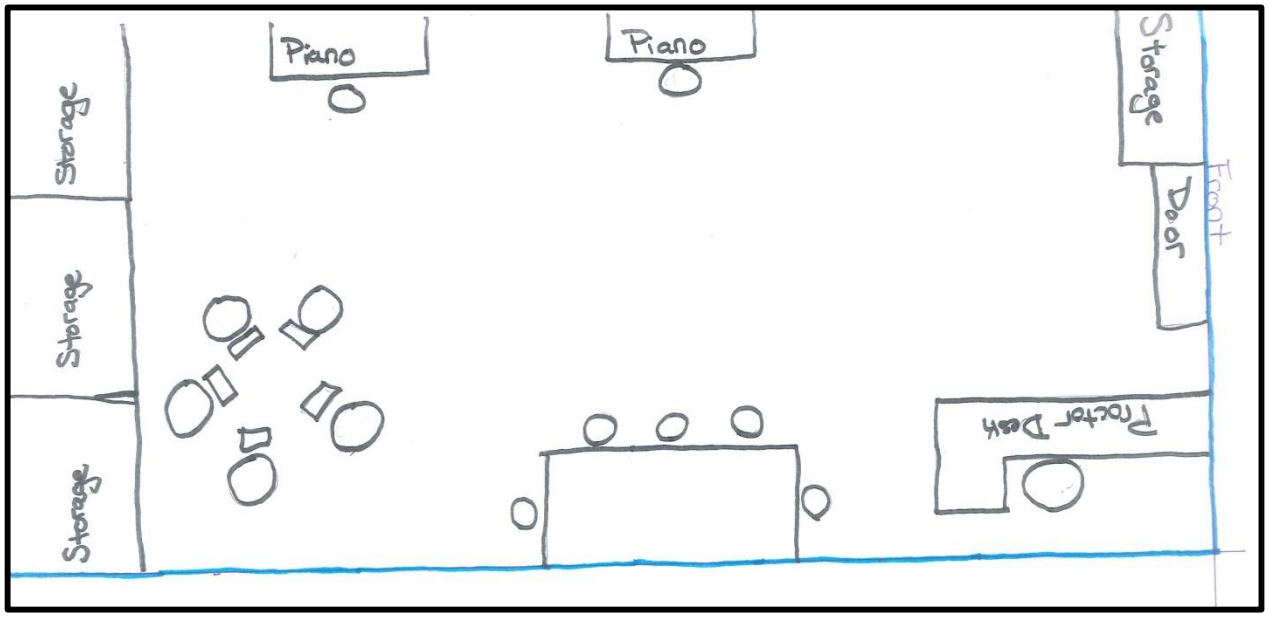


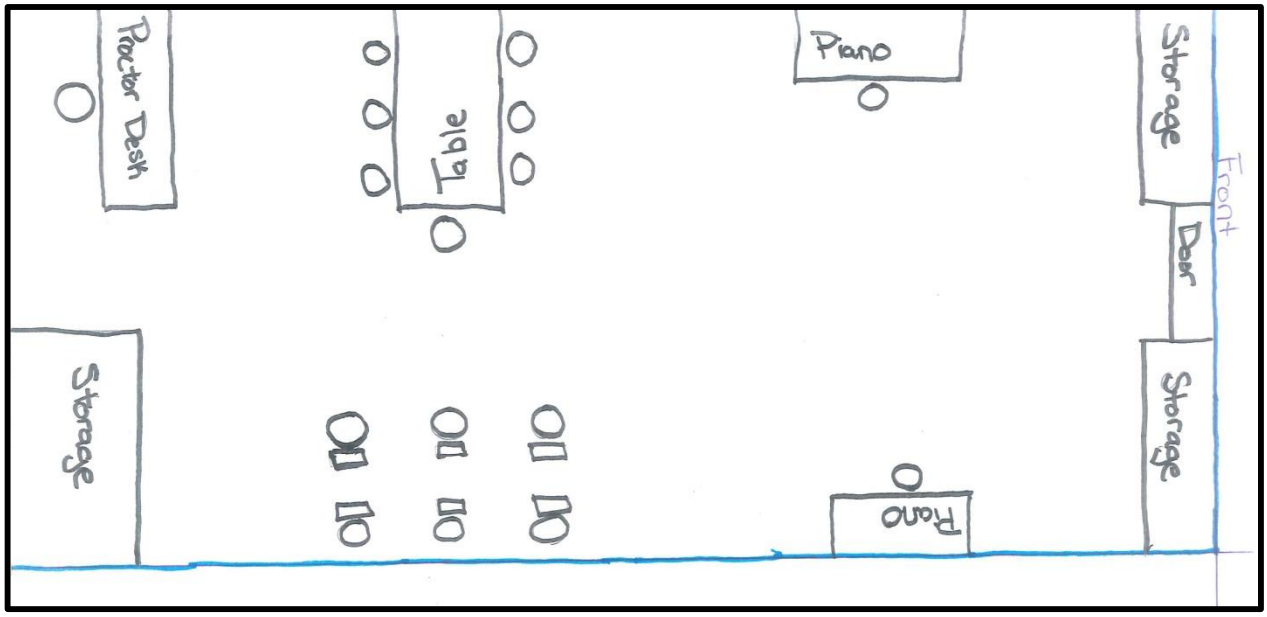
APPENDIX E: ART ROOM DESIGNS NOT SELECTED





APPENDIX F: MUSIC ROOM DESIGNS NOT SELECTED





APPENDIX G: RENOVATION PROCESS MANUAL

The following manual was presented to Madame Ouafae post room design for use in the renovation of the art and music rooms at the Rita Zniber Foundation. The rooms were dilapidated and abandoned, only fit for storage. Steps were taken to transform the rooms from their neglected state into planned art and music rooms. This included but is not limited to: chipping paint, plastering, applying a concrete sealer, painting and added necessary utilities. These processes are outlined in the following manual.

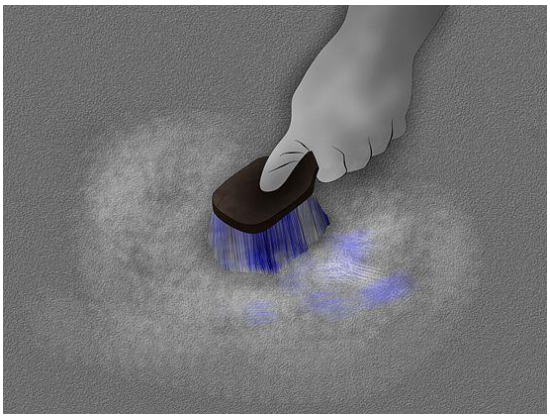
Step 1

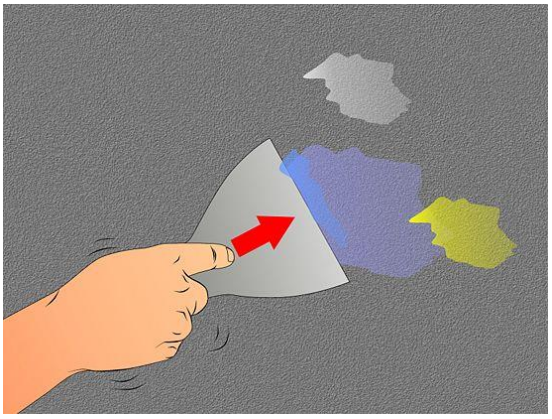
- Lay down a drop cloth or plastic to protect the tile flooring.

http://www.jalapenopaintwerx.com/blog/bid/209922/Interior-House-Painting-Costs-How-Do-I-Prepare-a-Room-for-Painting

Step 2

- Scrape away as much loose paint as possible using a paint scraper and a wire brush.





Step 3

- Clean the walls by scrubing with soapy water and a sponge. Allow the walls to dry overnight.

http://www.wikihow.com/Paint-a-Concrete-Wall

Step 4

- Repair any cracks with a patching compund or putty. Apply the compound with a putty knife and smooth into a thin layer to fill the area. Allow to dry over night

http://www.wikihow.com/Paint-a-Concrete-Wall

Step 5

- Sand around the areas that were filled to make it smooth.

http://footage.shutterstock.com/clip-2425496-stock-footage-sanding-plaster.html

Step 6

- Tape over any trim or windows.

http://www.realsimple.com/home-organizing/home-improvement/painting/six-steps-painting-room-10000001057007/page2.html

Step 7

- Apply one coat of concrete sealer using paint rollers and allow to dry overnight.

http://www.wikihow.com/Paint-a-Concrete-Wall

Step 8

- Apply one coat of primer to the walls and let dry for 24 hours.

http://www.wikihow.com/Paint-a-Concrete-Wall

Step 9

- Apply 3 thin layers of Latex or Acrylic Indoor Paint and let dry 24 hours.

http://www.wikihow.com/Paint-a-Concrete-Wall

Step 10

- Remove the drop cloth or plastic and tape.

APPENDIX H: ROOM USABILITY SURVEY TEMPLATE

On a scale of 1 to 6, one being least likely and 6 most likely please rate the following:

6. Do you like art?
7. How often a week will you use the art room?
8. Do you like that there is an art room?
9. Do you like music?
10. How often a week will you use the art room?

Please choose one of the following from pair:

10. Drawing or Painting
11. Crayons or Paint
12. Markers or Crayons
13. Markers or Pencils
14. Flute or Drums
15. Being Taught of Freestyle
16. Piano or Drums
17. Drums or Guitar?
18. Piano or Flute?

Survey Responses: Groups ABC								
Art Task: Drawing								
Scale: 1 = Least Likely 6 = Most Likely		**1**	**2**	**3**	**4**	**5**	**6**	**Total**
Do you like art?	Before	0	0	0	0	1	14	15
	After	0	0	0	0	3	13	16
How often a week will you use the art room?	Before	1	2	1	3	5	4	16
	After	1	3	0	1	6	6	17
Do you like that there's a room to do art?	Before	0	0	0	0	0	16	16
	After	0	0	0	0	1	16	17
Do you prefer: Drawing(1) or Painting(2)	Before	2	13					15
	After	3	12					15
Do you prefer: Crayons(1) or Paints(2)	Before	1	14					15
	After	1	14					15
Do you prefer: Markers(1) or Crayons(2)	Before	14	3					17
	After	15	2					17
Do you prefer: Markers(1) or Pencils(2)	Before	8	9					17


After
8
8
16

Survey Responses: Groups ABC								
Music Task: Instruction								
Scale: 1 = Least Likely 6 = Most Likely		**1**	**2**	**3**	**4**	**5**	**6**	**Total**
Do you like music?	Before	0	0	0	0	0	16	16
	After	0	0	0	0	1	15	16
How often a week will you use the music room?	Before	0	3	1	1	1	11	17
	After	0	1		2	1	12	16
Do you prefer: Flute(1) or Drums(2)	Before	6	12					18
	After	9	10					19
Do you prefer: being taught(1) or freestyle(2)	Before	13	3					16
	After	13	2					15
Do you prefer: Piano(1) or Drums(2)	Before	2	14					16
	After	3	11					14
Do you prefer: Drums(1) or Guitar(2)	Before	2	13					15
	After	5	9					14
Do you prefer: Piano(1) or Flute(2)	Before	6	9					15
	After	8	9					17

Survey Responses: Groups DE								
Art Task: Create Art								
Scale: 1 = Least Likely 6 = Most Likely		**1**	**2**	**3**	**4**	**5**	**6**	**Total**
Do you like art?	Before	0	0	0	3	0	6	9
	After	0	0	0	3	0	2	5
How often a week will you use the art room?	Before	1	1	1	1	1	5	10
	After	1	1	1		1	6	10
Do you like that theres a room to do art?	Before	0	1	1	0	0	7	9
	After	0	1	0	0	0	8	9
Do you prefer: Drawing(1) or Painting(2)	Before	6	4					10
	After	3	7					10
Do you prefer: Crayons(1) or Paints(2)	Before	6	3					9
	After	5	4					9
Do you prefer: Markers(1) or Crayons(2)	Before	2	2					4
	After	3	3					6
Do you prefer: Markers(1) or Pencils(2)	Before	0	9					9
	After	1	10					11

Survey Responses: Groups DE								
Music Task: Free Improvisation								
Scale: 1 = Least Likely 6 = Most Likely		**1**	**2**	**3**	**4**	**5**	**6**	**Total**
Do you like music?	Before	0	0	0	1	0	4	5
	After	0	0	0	1	0	4	5
How often a week will you use the music room?	Before	2	0	0	1	0	1	4
	After	1	0	0	1	0	3	5
Do you prefer: Flute(1) or Drums(2)	Before	2	4					6
	After	1	5					6
Do you prefer: being taught(1) or freestyle(2)	Before	4	1					5
	After	4	1					5
Do you prefer: Piano(1) or Drums(2)	Before	1	4					5
	After	2	3					5
Do you prefer: Drums(1) or Guitar(2)	Before	4	3					7
	After	5	2					7
Do you prefer: Piano(1) or Flute(2)	Before	4	2					6
	After	4	1					5

APPENDIX J: USABILITY TEST OBSERVATION NOTES

Overall Observations

Both Rooms:

1. Many other boys walked in and out of the rooms as the groups were working in the creative exercises. Most of the time they distracted the test subjects and overcrowded the room.
    a. This could be caused by curiosity.
    b. This should be avoided because overcrowding has negative effects on creativity and learning (see Ch. 3 on maximum occupancy standards).

Music Room:

1. Piano and drums were the most popular instruments.
2. Guitars were used in both drum circles but not the first instrument to be picked up.
    a. This could be due to the lack of knowledge of the guitar.
3. Harmonicas were rarely touched (It is noted that they are in a storage that is slightly hidden by the piano).
4. In general the groups needed more time to learn the song during the lesson.
    a. None of them have classical music training.

Art Room:

1. Not one group ever opened a drawer or closed cabinet door.
2. It was noted that one member of the Rita Zniber Foundation, (age 17) took on a leadership role in assisting with the proctoring of the art room testing. If a teacher is unavailable an older boy from the Foundation may serve as a proctor to the room.
3. Colored Pencils and Pencils were the most popular items.
    a. Both items were placed in clear view of all participants.
4. Stamps were used only by older groups.
    a. They were placed on the highest shelf of the tallest cabinet.
    b. This could be due to inability to see them.
5. Most groups talked a lot at the beginning but once they began to draw they became quiet, except for when asking for supplies, or showing off their art.
6. A few liked to show off their pictures.
    a. Could be due either to excitement, or extroverted characteristics.

Group A: Age 12 – 13

Music Room: Recorder Lesson

1. Experimented with Instruments Prior to Instruction
2. Assisted each other finger placement (while playing)

3. Wanted to show everyone when they got it right
4. Started to get distracted towards the end
5. Were able to learn pieces but not the whole song in one session
6. Post Session they played around:
    a. Most were interested in the piano
        i. They all tried to play with it at the same time

Art Room: Draw a Picture

1. Initially grabbed highlighters, colored pencils, normal pencils and rulers
2. Had to ask for pencil sharpeners and erasers
3. Not much discussion between them
4. Asked for more time
5. One showed progress to the translator half way through
6. All worked together to put everything back
7. In the end they asked if they would be able to return to the room
8. One got up to grab markers, turned around and swapped them out for the smaller ones
9. Drawings:
    a. Copied a painting already in the room
    b. Flowers and a stream
    c. 3 houses
    d. Super-hero
    e. Three Trees

Group B: Age 9

Music Room: Recorder Lesson

1. Pantomimed a conductor while the instructor played the tune for them
2. Liked the rhythm
    a. However, they took longer to get the rhythm
3. There were 6 boys in the room, therefore the instructor did not have a recorder
    a. This was noted as making things difficult.
4. Asked a lot of questions
5. Had trouble producing the notes
6. Got the rhythm not the notes
7. Did get to play any pieces

Art Room: Draw a Picture

1. They asked if they had to look for drawing utensils one by one or if they could go all at once
2. All stayed away from the paint cabinet
3. Grabbed Rulers, pencils, and colored pencils
    a. Took about one minute
4. Talked with each other a little, but not much

5. Two needed assistance with opening the colored pencil box
6. One stated that he wished he had a full hour to do art
7. One continued to work while all others assisted in clean-up
8. Drawings:
    a. All drew pictures of houses

Group C: Age 8 – 14

Music Room: Free Improvisation

1. **P**layed in pairs or small groups
2. Every type of instrument was used
3. Attracted a large crowd of onlookers
    a. More kids ran into the room
4. For the most part they all stayed with one instrument

Art Room: Draw a Picture

1. All went to the tallest storage closet and sort of fought over stuff
    a. They were told to share by an older boy of the Foundation
2. All grabbed markers except for one
    a. She grabbed markers when she saw everyone else using them
3. One participant grabbed a pencil
4. One asked if she could draw without color
    a. Translator Responded: yes
5. Asking each other to share their tools
6. Three showed their work to everyone
7. One asked if we would cut up his picture
    a. Response: No
8. Drawings:
    a. Herself riding a horse with people around
    b. One copied a painting already in the room
    c. Flower with Arabic calligraphy
    d. City
    e. Child

Group D: Age 13-14

Music Room: Recorder Lesson

1. Immediately picked up instruments to play
2. Took to rhythm quickly
3. Experimented with different sounds
4. Most were able to learn the first bar of music
5. Few were able to get through the whole song

Art Room: Create Anything You Want Using Anything You Want

1. Talking a lot during the explanation of the exercise
    a. One showed a lot of enthusiasm
2. Only one went to the tall storage
    a. Two went to the paint storage area
    b. All others went to the pencil and paper area
3. No one opened any doors or cabinets in the storage
4. The enthusiastic one was running around grabbing as many tools as possible
5. This group was continuously looking for supplies for the first 5 minutes
6. Asked for help in finding the right paint supplies and how to use them properly
7. One used a compass
8. They all watched what each other was doing
9. Grabbed stamps but did not know how to use them correctly
10. One was painting but when told he had 5 minutes left he changed his mind
11. Drawings:
    a. Heart
    b. Sun and house
    c. Trees with flowers and a person
    d. Sun

Group E: Age 15-18

Art Room: Create Anything You Want Using Anything You Want

1. Grabbed Colored Pencils and regular pencils
2. Put the whole basket of stamp supplies on the table
3. Talked a lot between each other
    a. Once they began drawing everyone was quiet
4. Got up to find rulers
5. No one looked in closed doors or drawers
6. Worked mostly by themselves
7. Asked for materials to be passed around
8. Drawings:
    a. People and scenery
    b. Two Copied a painting already in the room
    c. A creek in the middle of the forest
    d. Woman

Group F: Ages 15-20

Music Room: Free Improvisation

1. The Drums and Piano were most popular
2. Played in groups
3. Shy participants stood in the corner and played by themselves

    a. Began to play with the groups towards the end
4. Recorders and harmonicas were not used at all