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# Immersive Enviornments

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# IMMESIVE ENVIORNMENTS

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B.A., Southern Illinois University, 2007

A Research Paper

Submitted in Partial Fulfillment of the Requirements for the  
Masters of Science Degree

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RESEARCH PAPER APPROVAL

Immersive Environments

By

Kyle Wyne

A Research Paper Submitted in Partial

Fulfillment of the Requirements

for the Degree of

Masters of Science

in the field of

Professional Media and Media management Studies

Approved by:

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## CHAPTER 1

### INTRODUCTION

Fully immersive environments are not new in our world. They are all around us in different forms. But the idea of using these environments to teach students is an idea that is still in its early stages. Many of us have been to restaurants where the environment sets the mood and makes the dining experience more enjoyable like a Hard Rock Café. Recently restaurants have been taking their environments to a whole new level like the Rainforest Café which has waterfalls, moving animals, and thunderstorms all in the environment as you eat. This kind of environment makes dining more entertaining and keeps the visitors attention for a longer period of time. In the same way museums, schools, and churches are all experimenting with immersive environments to see if they can help the instructor complete their lesson or get their message across in a more effective manner.

In the Literature review that follow I have listed some examples that relate to museums taking a normal exhibit and transforming the space to make it interactive and entertaining for its visitors. Also, there are some examples of schools incorporating new technology into the classrooms to aid the teachers in teaching subjects to their students. Lastly, churches are searching for new ways to entertain and teach children in an effective manner that keeps them coming back weekly. These three examples are trying to teach through an immersive environment by including the technology that goes in to them. However, we

cannot look at these examples without first looking at the research that has been done in these areas.

Examples exist of exhibits in museums, classrooms in schools, and churches across the country where audio, video, and lighting have been used to take a normal lesson and change it into a place that draws people in. Audio, video, and lighting are elements that have been incorporated in multi-mediated teaching practices, but not to the extent of creating immersive environments that surround students in lessons and set the learning mood. Advances in technology are increasingly used on a regular basis to teach students in a class or visitors at an exhibit about a topic. But they are seldom used together to teach. If one of these tools helps in teaching a topic then wouldn't it make sense that these tools combined together would work better to teach that same topic? There are already some scarce examples of this kind of thinking in places around the world. Examples of this working in museums in an effective manner are the King Tut Exhibit, Spy and Espionage Museum, and the Lincoln Museum.

## CHAPTER 2

### IMMERSIVE TECHNIQUES IN MUSEUMS

Because museums need patrons to visit in order to generate revenue a lot of research has been conducted to see how exhibits need to change to draw people in as well as increase education of the topics being taught. Specifically, if one can keep the attention of a child in an exhibit then there is a good chance that the child will want to come back: this is the theory that is presented in the article *Gravitating Toward Science: Parenting-Child Interactions at a Gravitational-Wave Observation*. By getting parents and students involved about learning at the museum they are more likely to return because they had a good time. In this article, this practice is referred to as Active Prolonged Engagement (APE). When an exhibit at a museum uses APE, patrons are more likely to enjoy what they are learning. Also, by making the exhibits interactive and educational parents and museum staff are more likely to be accepting of these changes (Szechter, 2009, p.1-3).

It is also important that museums and teachers know how to measure the exploration of the students as they learn. In the article *The Exploratory Behavior Scale: Assessing young visitors' hands-on behavior in science museums* they have developed a way to measure this to see if the students are engaging and learning from the exhibit. Using the Exploratory Behavior Scale (EBS) is simple; one just observes the children and writes down their responses to the exhibit based on three areas of interaction. The first, is passive contact, this might be a

child casually playing with a part of the exhibit. Next is active manipulation; in this case the report suggests that an example might be a child rolling a cylinder down a ramp and then tries this again. In exploratory behavior, students will roll all kinds of cylinders down the ramp to see what changes among the different kinds of cylinders. With knowledge of how the students are interacting with the exhibit, it is possible for the museum staff and creators of the exhibit to conceptualize new ideas that will draw students to the exhibits and use these techniques to help the students learn (Van Schijndel, 2010, p.1-4).

Museums have also used theater to pass along knowledge of the exhibit to the students visiting. Theater can be used as an educational tool to aid in teaching students about the artifacts they see. Tony Jackson has written in his article that this is possible because students learn more effectively in a narrative way because they can see the objects being used in a real world scenario as opposed to just looking at the artifacts behind glass (Jackson, 2002, p. 1-7).

The King Tut exhibit integrates video, lighting and artifacts together to create an experience that brings interest to different parts of the exhibit. Upon entering the exhibit, visitors watch a video explaining what it would have been like to live back in the time of King Tut. Next, theatrical lighting is used to highlight different artifacts in the exhibit by illuminating them from as many as six different angles. This allows guests to see all the detail of the pieces as opposed to traditional lighting that most museums use (Newman, 2005, p.1-2). In the next part of the exhibit, blinding lights are used along with everyday artifacts found in

Egypt. This combination of lighting and artifacts give the exhibit a more realistic feel as if you are really in the desert. Because of the extreme nature of the lighting, in the next step of the exhibit it is easy to transport yourself back into this world of sun and sand (Newman, 2005, p.33-34). So what Rick Belzer (the designer) has done here is present a video to prep visitors for the world they are about to enter and in doing so gives them a chance to believe the world they enter into is real. This was all achieved by using theatrical lighting to transform the space and to light the artifacts from different angles to accomplish the goal of transforming this exhibit. So, once they enter this world of bright light mixed with artifacts the visitors can start to imagine what this world three thousand years ago would have been like with help from the video and lighting in this exhibit.

In Key West Florida a new museum has opened up focused on the golden age of piracy and the legendary pirate Blackbeard. Along with the detailed environment of the museum, recording technology of binaural recording was also used to bring this environment to life. An example of this is in the pirate ship area of the museum where sound effects like the ocean, birds, and boat sounds are played to recreate an ocean environment. This life-like sound is possible because of the technique of recording in a binaural format. This means that the sound effects were recorded in a real environment with two small omnidirectional microphones that are placed on a rig twenty to twenty-two centimeters apart at an angle of 120 degrees. When these instructions are followed correctly the sound that is recorded and played back transports the listener into a realistic

environment that perfectly replicates what the listener would hear if they were really there (Reinbolt, 2005, p.32). Again this audio technique fully immerses the visitors in this pirate environment by aiding the visitors in learning more about this pirate exhibit.

In addition to video and lighting, robotics have also been used in museums to aid in teaching and attracting children's interests to different exhibits. The addition of robotics to a learning environment gives artifacts and parts of the room the opportunity to come alive and seem real to the children. When you bring artifacts to life the room transforms in a child's mind from a museum to a new world.

A great example of robotics being used is the international spy museum in Washington D.C. This museum sets the mood by having its guests enter through a space age metal detector and into an elevator to the third floor. This journey sets the mood so guests are immersed in this new world with their senses fully engaged to feel the experience's authenticity. Again once you have your audience starting to believe they are entering a new world you must keep up this show by implementing audio, video, and lighting. And in this instance robotics are also used to aid in the museum's presentation (Bell, 2002, p. 7). At the international spy museum one of the cars that was used in the movie *Goldfinger* will come to life revealing missiles behind headlights linked with audio cues to add to the mystery of the car. This Aston Martin DB5 also has a rotating license plate and rotating tire shredders that will periodically rotate allowing visitors to

imagine what this weapon might really be like on the road. This museum offers many more exhibits that implement other technology to make the exhibits more interactive for children and parents. Also this museum has a submarine bridge with interactive touch screens so children can learn more about sonar and its uses (Mayfield, 2005, p.179-182). Again to aid in setting the mood on this replica submarine bridge lighting was used to bathe the bridge in a light blue light that ripples as it would if you were under the water. Now we all know that there is not really water inside a submarine. This would be counterproductive to what a submarine is meant for. However, this rippling of water tricks the mind into imagining that you are in a submarine under the water because of this lighting effect rather than being on the second floor of a building in Washington D.C. (Bell, 2002, 7-10).

These tools of drawing in the visitor into a world and immersing them in order to teach them is beneficial because the student is able to focus completely on what is being presented because everyday tasks have been forgotten with this full emersion. It is important to note that some believe that this full immersion is more show than learning (Mayfield, 2005, p.179-180). However, writer Robert Bell answers this concern well in his article reviewing the International Spy Museum.

*“At first glance, the International Spy Museum may seem more like themed entertainment than a legitimate archive. The flicker of neon and moving lights and ample textures and shadows make it an exciting place to visit. Although it has enough flask and gadgets to keep adrenaline-crazed junkies amused, it effectively*

*fosters an environment in which the history of espionage can be examined in a serious manner.”*

Therefore, all these extra techniques are great because they allow the guest to learn about a topic through full immersion. The Lincoln museum is also good example of this.

The Lincoln Presidential Museum is a museum that is fully immersive leading the visitors to focus entirely on the life of President Lincoln as if you have left your life behind and become a part of history. As you enter the large lobby of the museum you can go through the museum according to the life of the president from left to right. The full emersion of this museum allows guests to see what the president's life was like at different times of his life. One of the shows displays the president's life through the Civil War. This show immerses you in his life because video screens are moving all around you to show different parts of his life. Also during the battles, cannons appear on either side of the audience with exploding sound effects that shoot smoke rings into the crowd making one feel that they are right in the action. This entire show is fully automated. Once the museum employee presses the start button the audience is thrown back in time to learn about the life of Abraham Lincoln (Bishop, 2007, p. 39-41).

Personally I have been to this museum and love the fully immersive environment that has been created. I have never learned so much about President Lincoln than I did in one day at this museum. The museum did a great

job in weaving shows, artifacts, and information to all ages in a way that was captivating and understandable. My favorite show was the one on the life of President Lincoln because the theater became a part of history with cannons appearing out of walls during battle scenes and video being projected all around.

## CHAPTER 3

### IMMERSIVE TECHNIQUES IN THE CLASSROOM

Some museums have found that full immersion into a topic is very beneficial to teaching. However, classrooms do not have the luxury of high-tech theaters. So what teaching tools do classrooms and teachers have access to? Or is it possible for them to use technology in an effective way to aid in teaching their students?

Technology plays an important part in the classroom and should be used to aid students in learning lessons. This can be hindered if the teachers are not willing to learn and use the technology that is made available to them (Trotter, 1-2). However, video can be used to teach young children about themselves by simply using a video camera and a small television. By live streaming the video camera to a television the children can view themselves and see how they are moving. This idea can also include programs that allow the student to play interactively by watching themselves on the television screen and complete tasks based on their movements. For instance, hitting a ball as it comes to them on the screen or arranging letters on the screen to spell words. The possibilities are endless (Moving, 2002, p.9).

In a classroom some of these interactive technologies can be implemented to aid teachers in teaching their students new ways to learn. SMART Boards are an interactive way of giving students the chance to learn by playing a game (Robinson-Harris, 2009, p.3). Students learn to move images

that are projected onto the screen and can then manipulate them in order to win the game. Because this technology is interactive the students want to be a part of the learning process and because they are so invested in the creation of learning they retain what they have been taught in this lesson (Magic, 2004, p.9). An example of this is high school biology. Here, there are two parts to learning the subject: the students textbook and the lab portion of the class. Because students interact with what they are learning about they actually see what they are learning. Biology is more effective to learn from through practice rather than just reading about it in a textbook because students interact and dissect an animal in the laboratory.

In the same way, young children also enjoy learning through interaction. Children as young as preschool age enjoy using SMART Boards because they are interactive and it gives them an opportunity to use some technology that they are not accustomed to while having fun. An added advantage to this tool is that it keeps all students engaged which is a hard difficult task to accomplish with twenty students who range from age three to five. Incorporating this technology into daily lessons helps focus the students and aids in the students interacting with the lesson that is being presented by the teacher. One example is using the SMART Board to lead the morning message in a prekindergarten class. The students all gather around and with help from the SMART Board complete tasks by interacting with the board by answering questions. Animated figures dance around the screen as the students answer questions correctly encouraging them

as they learn. With this interaction the lesson sticks with the students better and they learn more because they are involved. Therefore, finding a way to have students interact with the lesson leads to a greater chance of students retaining what they have learned (Yes, 2002, p.1-2.).

This leads to new technology that can be incorporated into classrooms. For instance, with the use of a projector, games could be used as an interactive tool to aid in teaching students about different topics. Lighting could also be used in classrooms to direct children's attention to different activities while also being used to teach students about colors and shapes, and perform puppet shows for younger age students.

According to Buckleitner, early childhood is a great place to incorporate new kinds of technology. He has started using lighting as a way to teach her students both with flashlights and projectors. Many people look at a flashlight and neglect to see how this simple device can be the sole part of a lesson. If the lights are on then this is not an effective tool. But what if the lights were turned down low and it was used to guide the day and used to make choices. This is what Buckleiter is suggesting. By incorporating a flashlight into the lesson it is possible to take an ordinary day and let the kids learn from a different perspective by keeping the lights low and using the flashlight to focus the attention of the students (Lights, 2001, p.8-9). By turning the lights down, the teacher is making the students focus their attention on what the flashlight is illuminating, thus giving the teacher control over the class. In another article

written by Bulckleiter, he also suggests teachers try to incorporate moving shadows by having children move to music while a flashlight is being held behind them allowing the students to see their movements. This simple activity incorporates movement and also lets the kids see what they look like when they dance (Moving, 2002, p.11). This is just the beginning of what these ideas can help a teacher accomplish. We will look at more examples later, for this is just the start to the technology that is out there and can be used to teach children different subjects.

Audio, like video projection, can also be an effective tool in the classroom. One way that it can be used is to aid students in using their imagination. A teacher can play different audio clips of different animals to exercise the student's imagination while at the same time teaching a lesson about animals. By using audio students learn early on to use their ears to help in determining their surroundings and this feeds their imagination (Listen, 2000, p.9). When the teacher adds audio to a video or when a museum adds audio effects to an exhibit it stimulates one of the five senses (Trotter, 2008, p.4). The more senses that can be stimulated the more real a space like an exhibit or a classroom becomes to its visitors and this in turn helps the student retain more knowledge that they are being exposed to (Hall, 2006, p.231-243).

Teaching students through new technology is also important to play along with what is called "magical thinking" that children develop at the ages of pre-kindergarten and kindergarten age. This "magical thinking" means that that they

can not always determine the difference between what is real and what is fantasy (Smart Toys, 2001, p.7). This can be a great tool to use in a classroom setting because you can take kids on a journey to different worlds easily during a topic that a teacher is trying to teach. This in turn makes the teachers job a little easier and should be used to their advantage to teach the students. If a teacher can utilize this aspect of the child's mind to their advantage then there is great possibility for success to the lesson that is being taught (Smart Toys, 2001, p.8). Again this goes back to making the environment believable and immersing the students in a world that aids in learning the lesson. If this can be accomplished then it is very possible to have students that are not only learning effectively but also wanting to come back the next day for more.

In addition to teaching children, it is helpful to prep the children for learning by expending energy so they are able to learn. In a study published in 2009 researchers learned that physical activity builds children's self-esteem and prepared them for learning. In fact the benefit of physical activity is so great that this study finds when 45 to 60 minutes of activity a day is substituted for classroom instruction there was no loss in math or literacy skills. One explanation for this enhanced learning is that physical activity increases blood flow to the brain and this activity also stimulates brain development. Because of this stimulation students can learn more effectively. In the same way the lighting in the room will help the students to expend energy and prepare the brain for retaining what they are learning (Bailey, 2005, p.16-19).

## CAPTER 4

### IMMERSIVE TECHNIQUES IN CHURCH

Churches are also starting to experiment with full immersion and use it to teach stories to children in their kids programs. One piece of technology that is being used is intelligent lighting because of its many functions. Churches are turning to these lights because they can perform many functions and easily adapt to the different lessons that the church will be teaching from week to week (Beasley, 2000, p.58-59). In addition to the lighting being adaptable to the lessons, it also has the ability to shine on all parts of the room. This allows the teacher to gain all of the student's attention at the same time and direct it to the stage. This is possible by the lights shining all over the room and ending up pointing at the stage instructing the kids that it is time to start the lesson. After the children gather around the stage, the lights are redirected as the lighting for the stage, meeting another need for the room. After the lesson the lights then move around the room highlighting areas where the kids are going to meet to discuss the lesson. Intelligent lighting in this environment fills many needs and provides a cost effective option for a non profit organization to teach effectively (Lampert-Greaux, 2005, p.17).

So, because of this interest by museums, schools, and churches to teach through an immersive environment it is possible to create these worlds with the help of technology. However, there are some problems that have surfaced while

examining these readings that need to be addressed in order to make teaching through these immersive environments possible.

#### Problems That Need to Be Addressed

There are many benefits from immersive learning technologies discussed by the authors in these readings but I also see many problems that are not addressed. In regards to museums the largest issue they face is locating funding for their exhibits. That's why in most of the examples given in the literature review the museums that have these immersive environments are new museums that are being built this way. The problem that needs to be solved is providing a low cost option that can still teach students effectively, as well as making the environment fit the museum's current size to help make this idea possible. Lastly, when setting up these environments it is important to set them up in a way that can be updated regularly so the museum does not have to completely change the space. Instead it is necessary to make parts interchangeable so in the future the room can be updated to meet the needs of our evolving society.

The big problem that I see in the school system is with funding. I think it will be hard to have a room set up to only service one class. However, it might be possible to have one room set aside to service the whole school, and that room could be rented out much like a community computer lab, depending on the school system's relationship to the community and its resources for after-hours

staffing. In this way all ages would have access to this immersive environment and the expense would not be so large.

Also, the company that sets up the room could provide a monthly subscription in which different environments are featured each month and resources match what is available at the school. Teaching with light is also not used in early childhood classrooms. Using flashlights can turn a lesson into a whole new experience for the students. It can also direct the student's attention as they will tend to follow the light aiding the teacher in controlling their class and the attention of their students. The biggest problem that faces schools is the technology learning curve that teachers would have to overcome. Because of the age range of teachers some would have no problem learning this new technology but the more experienced teachers would have to take extra time to become familiar with this technology. Time is not something teachers have a lot of, so it would be important to come up with a simple guide to aid them in using this new technology properly. Because it is important to make our classrooms relevant to students, implementing technology into classrooms is a great way to see this happen.

## CHAPTER 5

### OTHER CONSIDERATIONS

There are many different kinds of churches and not all of them are interested in providing an environment that is interactive in their children's ministry. As someone who has attended different kinds of churches my entire life, most churches are so traditional that they prefer the older style of teaching their kids by using a picture book and a single teacher. I believe that this style of teaching is out dated for the younger generation and because of our culture we should be trying to teach in a more relevant fashion in hopes that children will retain more from the teachings. Also, a large hurdle for nearly all churches is resources. With limited budgets it is very difficult to try and implement this kind of immersive environment because of how much it costs. Thus, it is very important to consider ways that multiple parts of the environment can perform multiple tasks to keep costs down making this a viable option for churches.

One form of educating students that I would like to see would be immersing the students in the world they are learning about. This applies to all areas of learning in museums, classrooms, and churches. The point of this total immersion is to aid in the child's learning by making it enjoyable and educational. For example, one can find a way to take an otherwise boring historical topic that is normally learned in a book and instead immerse the student in an environment that teaches the student in an immersive and fun way. Then the student will be able to learn this topic in a more enjoyable way. In addition, stimulating all of the

human senses can bring a topic to life by incorporating technology into the room, in a sense to fill this gap of how the students might otherwise perceive the space. This can be done by using video to teach the students about the topic enhanced by accurate audio, in accordance to the lesson. In terms of touch, the room should be set up to look like the topic being discussed. The room should be able to be touched and invite interaction by the students. Also, interactive stations can be incorporated into the room like a suit of armor that students could put on to experience history. An example of a touchable space would be if a museum had an exhibit about jungles then the space should have trees, plants, vines, and water that the students can see and are relevant to the environment. Another area that can also be added would be the smells of a jungle. Using machines to provide smells of the jungle can add a whole new experience to visitors of the exhibit. Now this kind of immersion might be a little tough to bring into a classroom for a week or so. But what if the school had a room set aside that was for exhibits like this that any class in the school could come visit. Then environments would be available to help teach about these topics, and perhaps a curricular theme might extend across grade levels within the school so that the jungle setting might be utilized in different but unique ways for various instructional units.

This environmental space, if designed flexible and appropriate, would serve in a way similar to a computer lab that most schools already have, in that the school or district might subscribe to a particular topic or theme that is relevant

to the instructional units of interest, comparatively like buying software for its computer labs. This type of arrangement would not be an expensive endeavor but could change monthly depending on what the students are learning about.

In regards to this environment at a church, it would be similar to a museum where the space could be more permanent minus the fact that they would have to incorporate some of the churches needs. But, this space could incorporate a biblical theme and change monthly depending on the teaching and also be changed during special religious holidays that are celebrated by the church.

Also, it might be possible to set up a company that has ten to twenty immersive environments that travel around the country stopping at museums that were a part of this network of traveling immersive environments. Each museum in the network would have a space designated to this immersive environment that has the same skeleton. So, when the old one moved on and the new one arrived it would then be possible to set up the new one in little time because the structure was the same and the shell that is the new exhibit could easily fit into the space with little work. This would give the museum less down time in-between exhibits and more time for visitors increasing sales for the museum.

## CHAPTER 6

### METHODOLOGY

My project was an experiment in evaluating the effectiveness of an immersive environment at Vine Community Church by creating a jungle themed room, as referenced in the articles and by using the techniques that have been mentioned earlier in the paper. I combined an immersive environment with lighting technology to create a space that is both fun and educational to the students in it. By incorporating elements of environment, lighting, sound, technology, and physical fitness, all within a church my intention was to create a place that is educational to the students that are immersed in their topic. In order to set up this immersive environment the following items were needed and were agreed upon for the 1<sup>st</sup>-5<sup>th</sup> grade room at Vine Community Church. Below is the budget for the items that were needed.

TABLE 1

1.	2 x Design Spot 250 by ElationPro.....	\$3000.00
2.	2 x Scanners.....	\$500.00
3.	3 x Lazar Stars.....	\$900.00
4.	1 x Hazer.....	\$150.00
5.	1 x Lighting Console.....	\$150.00
6.	1 x Video Projector.....	\$350.00
7.	1 x Retractable Screen.....	\$175.00
8.	1 x Audio Console.....	\$200.00
9.	1 x Amplifier.....	\$250.00
10.	2 x JBL Subwoofers.....	\$750.00
11.	2 x JBL Speakers .....	\$1000.00
12.	1 x Surround Sound System for tree house.....	\$150.00
13.	<u>1 x Wireless Microphone.....</u>	<u>\$200.00</u>
	<u>Total.....</u>	<u>\$7775.00</u>

All expenses for this budget were covered by Vine Community Church as they are renovating their children's wing.

After setting up the room at Vine Community Church with lights, audio, haze, and video, the children's reaction to this new environment would be noted. For some of the kids it was their first time ever being totally immersed in this kind of environment. I knew that with the room lights dimly lit, the intelligent lights would have the opportunity to move about the room easily and be seen by the

children. The lights were set to move all over the room shining on different parts of the climbing equipment drawing more attention to these parts of the room. At different times, the lights move to the floor giving the children time to chase the lights and run through them while they move and change color. This movement before the service begins was designed to prepare the children for learning the day's lesson. The plan was to play electronic jungle music to create a high-energy environment for the children.

In addition to the moving lights, the children would also be moving and running around this room to burn off energy during the first ten minutes of class. This is in preparation for the rest of the class time. Mike Berardi the Children's Pastor at Vine Community Church had suggested that the children might listen better during the teaching if they were given the opportunity to get rid of some energy in the beginning. The high activity of the lights and music was intended, hopefully, to aid in the loss of energy in the children, preparing them for the teaching later.

Overall the project was designed to be a fun environment for the kids and one that they would want to come back to regularly. Education and fun were the top priorities in the creation of this room. Incorporating the elements of lighting, audio, and video in a fun way was considered necessary to carry across this idea of a jungle environment.

After all elements had been installed in the children's room there would be three observations that would be significant to this project, namely seeing how

the kids react and if these elements helped in entertaining and teaching children. These areas would include determining the effectiveness of intelligent lighting and immersive space in teaching children, and evaluating whether this space make kids want to come back to learn.

In regards to the lighting in the room, it was very important that these expensive pieces of equipment were effective in guiding the children's attention to the different parts of the lessons that would be taught. The goal for the lights were to aid the kids in moving around the room playing and running off energy. In the next phase of the service, the lights would move to the stage directing the kids to focus on the teacher and the instructions they were teaching. Next, music would start playing and the lights would go crazy for the kids to enter into a time of worship. The lighting in this instance was to encourage the kids to enjoy singing and participate with hand motions of the songs as they were led by the teacher. After the lesson part of the service is intended for small groups. The kids would be instructed to sit in different parts of the room based on their age and by the shapes the lights would emit. The kids simply gather around the illuminated shapes on the floor and as their small group leader starts the meeting the lights would dim out as to not distract the kids during discussion. The intelligent lighting plays a very important part of this immersive environment.

Observations on the students that are in the room would be documented to see if the children ran around the room and interacted with their surroundings and if expending of energy at the beginning of the service helped the students

pay attention during the lesson. This would be evaluated when observing whether they were perspiring or out of breath. Interviews would also be conducted with the teacher in the classes to see if they have noticed a difference in the attentiveness of the children as they moved through the service.

The second observation would be evaluated on acceptance of this immersive environment by the children. It would be interesting to see if this jungle theme that the kids entered into assisted them in learning or if the activities and lights moving around would be too much for them to handle. The (EBS) scale from the aforementioned article would be used measure the lights' effectiveness and determine whether the kids engaged in the immersive environment.

Lastly is the attraction that the room would have on the children. It is important for this room to draw the kids back every week. With the jungle environment, kids would be able to enter into a new world and play in the moving lights and climb into a tree house. Combining a fun space with climbing, lights, slides, and music should be a great place for retaining the kids that come.

For all of these observations, I planned on being in the room to watch the kids interact with the space to see what areas worked and what areas still needed improvement or needed to be removed based on the (EBS) scale. This would be an effective way to view the intelligent light and the immersive space itself. Also, my plan included examining electronic attendance records from the

church to see how often the kids return to the children's program and determine if the new environment has helped draw children back every week.

After all of the setup and gathering of data, I anticipated finding that the lights would direct students to different parts of the room and be very influential in dictating the structure of the service. I also expected that because of the wild nature of a jungle and the fact that nothing like this exists in Southern Illinois that it would draw and retain kids that come to this program. I cannot imagine any child coming to this church not being hooked once they enter this room.

## CHAPTER 7

### RESULTS

In observing the classroom children, I noticed that they are drawn into the room with wonder and amazement. As soon as they enter the room their eyes light up and you can see the excitement on their face as they try to decide what to do first.

While observing the room I started by looking at the interactions between the students and the lights. The children loved the lights according to the EBS scale they moved about the room following the lights as they move to different parts of the room. According to the EBS scale the children showed exploratory behavior towards the lighting by running through it chasing the light and interacting with each other to make up their own games. I also noticed that kids were running around the room and clearly expending energy. This was observed by perspiration and heavy breathing after ten minutes of play. When it came time for the children to focus on the stage to start the lesson the lights directed their attention to the stage and seemed to help in this area. After a few weeks of implementing the lights a number of volunteer teachers at the Vine said that they have noticed a large improvement in the children's ability to be able to focus during the teaching because of the lights. This evidence provided by the teachers proves that the lights helped the children in focusing on tasks and objectives during the children's service.

One interesting event that I saw was the children seemed to interact more with the lights when the light was stationary pointing at the floor. Because of the lights position they were able to play in the light, run through it and pretend different scenarios because the light was in a stationary position. This observation needed to be noted so future programming of the lights includes giving the children more time to play in the lights during the initial phase of the children's service.

My next observation focused on the kids interacting with the room. As I mentioned earlier the kids upon entering the room were running all over the place discovering this new world. Most of the kids were running climbing up stairs, crawling through tubes and sliding down slides. Again according to the EBS scale the children exhibited exploratory behavior towards the bridge, tunnels, and slides. They loved creating trains and following each other through the maze of climbing equipment. Therefore, the room was a great success in being an interactive space for the church.

Lastly, I sat in a chair by the parent pickup for this room to listen in on the verbal feedback that the children were giving to their parents as they were picked up. At no time did I reveal myself to alter the results of this test. The feedback was all positive, with children telling their parents how much fun they had in the room and some had a hard time leaving. A few of the children said, "They wanted to come back next time." Others left the room jumping up and down saying "That was so much fun; can we do that again!" This reaction from the kids

in turn pleased the parents, making it more likely for them to come back next week. So, the ability for this space to draw children in and keep them coming back every week was effective based on the reactions of children and parents.

## CHAPTER 8

### CONCLUSION

After the room had been established for a month I talked with the children's pastor at Vine Community Church to see what the reaction was from his staff and volunteers about the newly renovated room. He said that the staff has seen an increase in attentiveness by the kid as the lights lead their attention from one activity to another making it easier for the teacher to lead the class time. The volunteers have also noticed that giving the children ten minutes to run off energy at the beginning of the class time has helped because the children listen to instructions after getting rid of that initial burst of energy in the mornings. The overall jungle theme and climbing equipment in the room has also helped keep the kids entertained which gives the teacher and volunteers time to interact with individual kids and address problems. Additionally, children want to come back every week because they are enjoying themselves and because there is no kind of environment like this in the Carbondale area.

The renovation of the children's wing has been successful and has a promising future. There are still a few bugs to work out like changing the initial lighting sequence to include more time pointing at the floor, giving kids time to play in the lights. But the initial reaction to the room has been well received and has made for a fun environment and one that children want to come back to the church. I am very happy with the results and look forward to observing children

in this space in the future to continue to learn how this space can be improved upon.

In conclusion, my intention was to determine if an immersive environment could help students learn while aiding teachers in leading the class. I believe that this immersive environment has great potential to positively affect museums as they look to new ways to instruct visitors. Schools can also look to this method to potentially teach their students in a fun and engaging manner. Finally, churches that are searching for new technology to implement into their children's ministry can use this method to teach topics and draw the children back every week. In my example I used lighting, audio, video, and physical activity to create an immersive environment that children can learn more effectively in. All of these examples have potential to change learning from the normal book method to a whole new world that immerses the student in the topic and teaches them in a brand new way that they have never experienced before.

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Research Paper: Immersive Environments

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