

# North Dakota State University Graduate School

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**Title**

Absorbent Minds: Challenging Utopia Through Atmospheric Architecture

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**MASTER OF ARCHITECTURE**

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ABSORBENT MINDS: CHALLENGING UTOPIA THROUGH ATMOSPHERIC  
ARCHITECTURE.

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## **ABSTRACT**

Since the time of John Amos Comenius the way in which we teach has remained constant. A simplified metaphor for learning amplifies the argument that the view of early education is in a utopian state. When in reality the curriculum is a mold to fit learners into, that prepares them to become a cog in the wheel we call the workforce.

The goal is to combat this problem using principles from both the Maria Montessori and Reggio Emilia approaches to learning to create an atmosphere that inspires learners and allows for the flourishing of creativity and self-discovery.

This thesis aims to reinterpret what it means to practice a deeper meaning of learning in and out of the classroom setting.

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## **DEDICATION**

I would like to dedicate this thesis to my family. Time and time again you have helped push me to reach for the stars. Without your love, support and guidance it would have been nearly impossible to get to where I am today. I am so blessed to have such wonderful people on my side. You are my inspiration; I love you to the moon and back.

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# 1. INTRODUCTION.

Across the globe, there is one topic that remains at the forefront of the conversation amongst everyone. An essential to human development, and that is learning. Whether it is in a more institutional setting like a classroom or rather in one's home, in one way shape or form, all people have experienced learning. For most, especially in the United States, institutional learning begins at a Pre-K or Kindergarten level and continues through Post-Secondary Education. For the sake of this thesis, the focus will remain within the early years of learning. For all children, this is where the building blocks are formed, and the foundation of their education is built. On Average a child will spend nearly 1,000 hours a year in a classroom setting. (*4.3 School Hours*, n.d.) Making the environment in which learning takes place as important as the content being distributed. The space surrounding a student is an extension of learning. It provides support in a multitude of ways including creating a safe space for children to grow as well as aids in productivity and creativity. Atmosphere plays such a vital role in the developmental years of a child's life that it only makes sense that these spaces are best suited to support the growing needs of the young learner. This leads to the purpose of this thesis.

## 1.1. Problem Statement

The modern-day educational model is set up in the sense of the eidetic. Which is described as "Of, relating to, or constituting visual imagery vividly experienced and readily reproducible with great accuracy and in great detail" (*EIDETIC Definition in American English | Collins English Dictionary*, 2024) Meaning that a great deal of the knowledge that is taught is done so through the use of imagery. As technology evolves more time in the classroom is spent looking at a screen or in a textbook. Not to mention that a many times learning from the standard

curriculum is all about cramming for a test only to lose a majority of the content when changing to a new subject. But what if there was a way in which architecture could impact the quality of learning, creating a more well-versed learning experience.

### **1.1.1. Research Question(S)**

- How can atmospheric architecture aid in the way children learn during their developmental years that builds a foundation for the future of their education?
- Are there any established fundamentals of Montessori Design?

### **1.1.2. Proposed Outcomes**

This thesis aims to produce a model educational center that creates an atmosphere that is not only productive but also draws from principles of both the Maria Montessori and Reggio Emilia approaches to learning.

## **1.2. Objectives**

Through the use of educational models such as Montessori and Reggio Emilia, the objective of this thesis is to design a model educational center that creates an atmosphere that is not only productive but invites children to explore the world around them.

### **1.2.1. Aim**

The aim of this thesis is to produce an atmospheric experience in which children are able to explore their passions, allow their creativity to flourish and to create an overall well versed learning environment.

### **1.2.2. Significance**

Education is a topic that is applicable to everyone. As previously mentioned, the modern-day educational system is built on the foundation of the eidetic. Using visuals to introduce individuals to the world around them, however, this way of learning can only go so far. Children are learning every day. Fine tuning skills already learned as well as acquiring new ones to build upon each other in order to shape them as members in this world.

## **2. Background**

To fully understand what is making the current atmosphere in which our children are learning lacking in inspiration and what can allow for a deeper meaning to how they interpret the world around them. To assist in highlighting the matter in question, I would like to introduce the thoughts of historian and philosopher Hannah Arendt.

Her essay *The Crisis in Education*, discusses how the United States education system has slowly created a problem for itself. To state that time and time again, politics and education have melted together. One aspect of this issue is described as the following: “Thus, the child, the subject of education, has for the educator a double aspect. He is a new human being, and he is a becoming human being. This double aspect is by no means self-evident, and it does not apply to the animal forms of life; it corresponds to a double relationship, the relationship to the world on the one hand and to life on the other.” (Arendt, 1961)

To unpack what is being said, children are held to this standard that they should know better, but I’d argue that every day children are growing and developing, that they are learning as they go. In the same sense, why are schools holding children in a set one size fits all curriculum. When in reality learning should be adapted to the individual child as no two are the same.

### **2.1. The Use of the Eidetic**

In order to dive deeper it is important to look back to what some would consider to be the precursor to the modern-day utopia of the education system. In the sixth edition of *Chora*, Jonathan Powers’ essay “Utopian Knowledge: Eidetics, Education and the Machine” which introduces us to the idea of the Eidetic which can be described as: of, relating to, or constituting visual imagery vividly experienced and readily reproducible with great accuracy and in great

detail. The use of the Eidetic to teach can be traced back to the 16<sup>th</sup> century as one of the original fundamentals of teaching. This is where Powers introduces us to Tommaso Campanella, an Italian philosopher and writer whose work includes *The City of the Sun*. A fictional tale of a city comprised of seven rings, that reflect the seven planets, connected by four streets, which align to the four cardinal points. At the city's center is a temple that is symbolic of the sun. The Solarians of this city instilled a specific system for how they passed down their knowledge. Utilizing imagery to educate their youth, this society covered every surface they had access to, adorned with murals that depicted the world around them, from language to astrology.



Figure 1. Circular Streets and Cities  
(Source: EPFL)

Throughout his writing, Campanella alludes to the idea that imagery is the key factor in pedagogy, even though the writing contains no source of imagery itself, leaving all visual factors to the imagination. Following closely in Campanella's footsteps is John Amos Comenius, considered to be the Copernicus of education, who like Campanella, Comenius believed imagery alone was the key to education. Comenius had this idea that "The totality of human knowledge can be represented eidetically and that such representations can be fully integrated into a city, socially as well as architecturally" (Powers, 2011, p 234). This idea that Eidetics can hold the key to everything. Though Comenius had his ideals about the relationship between imagery and education, his biggest goal was to achieve utopia for the education system he was working to create. Not just for education itself but to create a system that would help shape society. Making his ideals not only about knowledge but about "perfection of human nature through visible knowledge" (Powers, 2011, 240-421). Comenius Relates some of his work to that of Campanella. In his book *The Labyrinth of the World and the Paradise of the Heart* (1623), Comenius writes of his own city. Much like *The City of the Sun*, Comenius' city is organized in a very specific way. Creating a journey from the beginning of life through death. Where the main character is making his way to the center of the city and describes it as a deceitful anti-utopia. Comparing the world to a machine (Powers, 2011). Comenius writes this machine is the utopian antidote to the depraved world.



Figure 2. The Labyrinth of the World and the Paradise of the Heart'  
(Source: Hotel Prague City)

### **2.1.1. Utopia**

The concept of utopia in regard to this thesis paper relates to how it plays a part in the education system. Oxford defines the word Utopia as “An imagined place or state in which everything is perfect”(Utopia, n.d.). Some would say that Comenius’ goal of creating a utopian education system has been achieved. With the way the school system has been set up, it has created a machine that children enter the second they start elementary school and come out the



other end ready for the work force. But to a certain extent it could be argued that instead of utopia the education system has fallen into a dystopia of sorts.

One cultural example of this would be popular fiction like the *Hunger Games* or *The Divergent Series*. Where in both scenarios, society has fallen apart and the remedy that has been set into place is to conform all people to fit a mold making life feel like a machine. This structure is set in place to build the next round of individuals that fit the cookie cutter shape that society has chosen.

## 2.2. The Gestalt

The world around us shapes who we are as individuals. Throughout our lives we are influenced through social and cultural aspects we interact with. Juhani Pallasmaa in his essay *In Praise of Vagueness: Diffuse Perception and Uncertain Thought* delves into the topic of how we perceive the world around us. Pallasmaa writes that we only see a mere four degrees of the total 180 possible. With that being said it is important for our brains to interpret the remainder of the 180. This is where the gestalt becomes an important aspect of understanding. Gestalt theory is described as an organized whole that is perceived as more than the sum of its parts.

(Dictionary.com) It is the conscious mind arranging and thinking about order. Pallasmaa however, expresses the importance of unconscious thought. Or “gestalt free vision”. He claims that in order for creativity to flourish the brain (or conscious mind) must take a step back in order to be able to flow freely. Teaching, in relation to the previous thoughts, “has strong interest in focused vision, strong gestalt, conscious intentionality and the perspectival understanding of space.” (Pallasmaa, 2010, p. 6). Pallasmaa, however, makes a point that perspectival space turns us into outsiders and observers. We observe space rather than being immersed in it. Tying this into creating a remedy for combating the machine and supposed utopia of the current education

system, it is important to stress the importance of being immersed in experience of learning rather than seeing it on a screen or in a textbook. Pallasmaa brings up that photographs themselves have a prechosen focused percept whereas lived reality and experience relies on the background, writing, "...we sense the continuity and completeness of space around us as an embrace. We even sense the space behind our backs; we live in worlds that surround us. Not in frontal retinal images." (Pallasmaa, 2010, p. 9). Immersing children in the world they are learning about is the key to creating a more well-versed educational environment.

## **2.3. Experiential Learning**

At the core of this thesis is the typology that is used in order to answer the research question. The goal is to critique the learning style of using Eidetics and instead turn in a new direction of experiential learning.

### **2.3.1. Montessori**

Montessori Education is an alternative learning approach. Developed by Maria Montessori an Italian physician and educator. Who had the philosophy that children should create their own path for learning. Starting her career working with children with disabilities, Montessori picked up on new methods of teaching which she later translated into a whole educational model. Montessori is about letting the child lead the way and explore pathways they decide on depending on what most interests them. Today there are over 3000 Montessori schools across the nation and this philosophy continues to grow. (*What Is a Montessori School?*, n.d.).

#### ***2.3.1.1. Montessori Classrooms***

In a Montessori classroom everything is at full access to the child. Rather than detailed lesson plans that a child has a specific set of instructions and supplies for, Montessori lessons are introduced and then available for the child to do when they please. Alongside the access to activities, everything within a classroom is of the scale of the child. Bookshelves, tables and chairs, restrooms and sinks are all child sized allowing for a child to build autonomy and learn responsibility. Mixed age classrooms allow for students to learn from their peers and with those small class sizes allow Montessori educators to more one on one time guiding the child in their education.

### ***2.3.1.2. Montessori Teaching***

The way in which a lesson in Montessori is taught is very unique. Over the course of the school year, children continuously build upon the knowledge they gain. They start with life skills like preparing snack or cleaning up afterwards, motor skills learned during these beginning stages set up a child for more complex tasks later on. One example of an exercise that could be taught in a Montessori classroom is the bleeding tissue paper activity shown in figures 3 and 4.

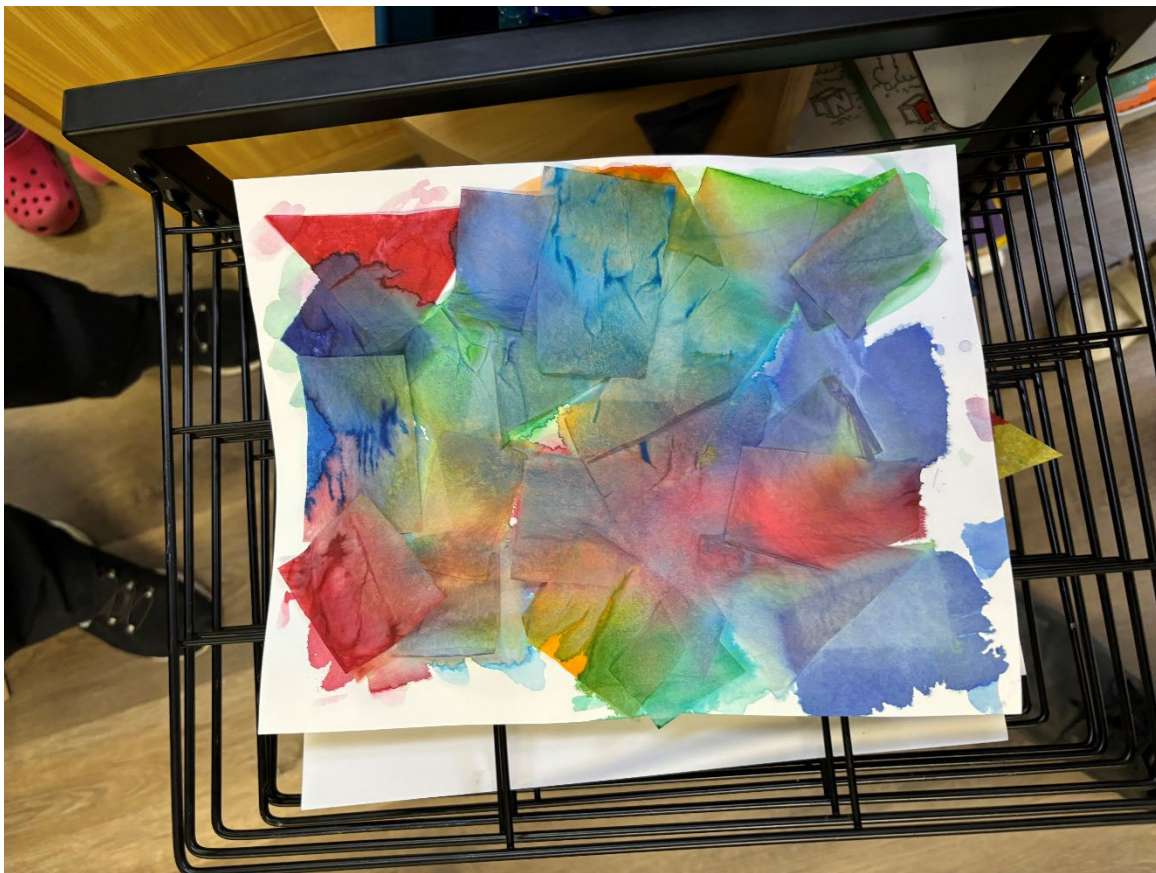


Figure 3. Bleeding Tissue Paper  
(Source: Childrens Montessori Fargo)



Figure 4. Bleeding Tissue Paper Activity  
(Source: Children's Montessori Fargo)

This activity consists of a student cutting strips of tissue paper and laying them on a blank piece of paper. Next the student will brush water over the top of the tissue paper allowing the ink to bleed from the paper and blend together. Once dry, students trace a stencil on their artwork and cut it out. From an outside perspective this may seem like an everyday art project, but when you break it down this one simple activity teaches a child so much. With just this project alone students are learning about colors, how they blend, why the colors bleed when water is added. Fine motor skills are built upon as they paint, trace, and cut the paper. Not only are skills and knowledge learned about the activity, but it can be taken a step further and lead into so many other paths of knowledge. This activity allows for so much room to learn as it is built upon skills and knowledge previously learned. One-way children learn is through a concept called the Absorbent Mind. In the words of Maria Montessori “The absorbent mind is the sponge-like capacity to absorb from the environment what is necessary to create an individual from his or her specific culture” (*The Absorbent Mind*, n.d.).

The Absorbent Mind refers to abilities of our minds from birth through age six. This absorbance is the reason children can learn to speak in their native tongue so effortlessly. Through being immersed in language they start to learn vocabulary, grammar, and the emotion behind the words they are speaking. This is how a child learns to communicate.

### **2.3.2. Reggio Emilia**

Stemming from the Montessori philosophy is another educational philosophy. The Reggio Emilia approach to learning was adapted from Montessori but also takes things a step further when it comes to child guided learning. In the 1930s Loris Malaguzzi, who had already had a background in education, decided that many of the early educational schools were not up

to the same standard. Writing “The Child is made of one hundred... They tell the child: that work and play, reality and fantasy, science and imagination, sky and earth, reason and dream are things that do not belong together. And thus they tell the child that the hundred is not there. The child says no way. The hundred is there.” (*Reggio Children - 100 Languages*, n.d.). Malaguzzi, wanting his children to experience a fair education, decided that there needed to be a reform in the way children received their education. He opened his first preschool. Here children were encouraged to follow their own pathways and ideas.

### ***2.3.2.1. Reggio Emilia Practices***

In the Reggio Emilia practice children are encouraged to create their own pathways for education. Here, teachers are encouraged to have a bit more of a hands-off approach but instead provide guidance when it is necessary. The Reggio Emilia Approach “Is based on the image of a child with strong potentialities for development and a subject with rights who learns through the hundred languages belonging to all human beings, and grows in relations with others.” (*Reggio Children - Reggio Emilia Approach*, n.d.). Malaguzzi believed that the educator should provide guidance but that the child should lead the way of their education saying: Quite possibly one of the most important aspects of Reggio Emilia philosophy is the concept of the piazza.

### 2.3.2.2. *The Piazza*

In common terms the Piazza is a town square or plaza where people of the town are able to socialize and trade goods and services. A piazza in terms of Reggio Emilia philosophy is meant to be a space that allows children to intermingle with other classrooms and learn from each other. Much like the mixed age groups of Montessori, the piazza allows for children to make friends and learn from peers, older them and teach children who may be just starting their educational journey.



Figure 5. Giacinto Giagante, Piazza 1876  
(Source: Meer.com)

## 2.4. Potential Issues

In the specific site one aspect that could arise with the typology of this design would be that since the site is located in such a high-density educational area, a new model might have



potential to struggle fit in. However, the purpose of this thesis is to challenge what is currently being done. A high-density educational area seemed like a great fit to show where education started and the direction this research could take it.



### **3. Methodology**

#### **3.1. Design Approach**

The approach taken in the design process simply came down to in what ways the modern utopia of the education system could be challenged. To reinterpret what is currently being done and reform it to create a better atmosphere for children's creativity to flourish.

##### **3.1.1. Real Life Experience**

A resource used in learning about the Montessori philosophy of learning was the Director of Children's Montessori, located in Fargo, ND. Dr. Camille Brandt is the director and founder of Children's Montessori, a collection of four schools that teach from as young as two months old up to five years old. Having a background in education herself, Dr. Brandt has always had a passion for teaching. Utilizing the knowledge she was able to provide helped aid in some of the fundamentals of classroom learning and what was vital in terms of design for a Montessori learning environment.

#### **3.2. Project Location**

When thinking about a site it felt important to relate back to the original goal of creating an atmosphere that challenges what is currently being done in most learning environments and that inspires and allows for gestalt free learning. Choosing a site simply came down to where "utopia" could be challenged. In the United States Boston Massachusetts claims to be the forefront of education. In fact Boston is home to the nation's first public school, The Boston Latin School which was founded in 1635. So this is where the design is situated. Ideally this is a program that would benefit any community, but the goal is to challenge utopia.

### 3.3. General Site

More specifically the site chosen is situated in a high-density educational region of the city. It is in proximity to the Boston Latin School as well as Emanuel University, Harvard University, Boston University Fenway, and Northeastern University. This is a representation of showing where the education system started, and the purpose of my thesis is to create a new direction in which education should be headed.

### 3.4. Specific Site

The Specific site is located at 400 Fenway, Boston Massachusetts. Currently the site is a large parking lot used for the library at Emanuel College. This site sits back off the road and is surrounded by trees, allowing for some privacy from the busy campus. This gives the site the allowability to create a more natural environment in the big city.



Figure 6. Site Context Map

### **3.5. Any Other Pertinent Research**

Alongside the research of the historical aspects of education and the Montessori and Reggio Emilia Approaches to learning there was one aspect of research that was important to dig into and that was whether or not there were any physical fundamentals of design for this specific program. One reference that was heavily studied during this research was *Montessori Architecture: A Design Instrument for Schools* from the Association Montessori Internationale and the Aurthur Waser Foundation. This guide houses not only twenty-eight patterns found in Montessori Schools but also examples of schools successful in providing students with an environment that allows them to create their own path.

Some of the core fundamentals that were chosen to dive deeper to with this design were the use of natural light, multiple levels, compression and expansion, the melting of a barrier between inside and out and Entering from the East. Now this last one is a representation of the inclusivity of Montessori. Meaning that no matter the culture, race, or faith the sun rises in the East for everyone.

#### **3.5.1. Architectural Tectonics**

Architectural tectonics is an aspect of design that ties in with the teachings of Montessori. With Montessori teachings, the fundamentals of lessons can be pulled apart, rearranged and reformed in order to create a different lesson. When these lessons are grouped together this is where education as a whole comes together. Similarly, the tectonics used in architectural design can mirror this. For this thesis it was important to take aspects of what is currently being done in most early educational settings, pull them into their simplest forms and functions, reform them to better suit the needs of a Montessori school. From here they would be placed back together in order to create a solution to the overarching research question this thesis aims to answer. Much

like the young learners of Children’s Montessori made their own reinterpretations of the bleeding paper activity.

### 3.6. Precedents

Based on the previous research it was important to find precedent studies that were successful in accomplishing the previous fundamentals.

#### 3.6.1. Maria Montessori School – Hampstead England

The Maria Montessori School, located in Hampstead, England was once home to one of the training organizations affiliated with the Maria Montessori Institute. The five-story school was originally designed by William Willett in 1886 with the addition and renovation by Carrick Howell and Lawrence Architects and Richard Partridge. Built in 2015 this school spans 867 square meters and highlights the use of keeping everything at the scale of the child, melting the indoors and outdoors as well as a copious amounts of natural light. (*Montessori Architecture – Maria Montessori School, n.d.*)



Figure 7 – Maria Montessori School Hampstead, England  
(Source: Montessori Architecture)

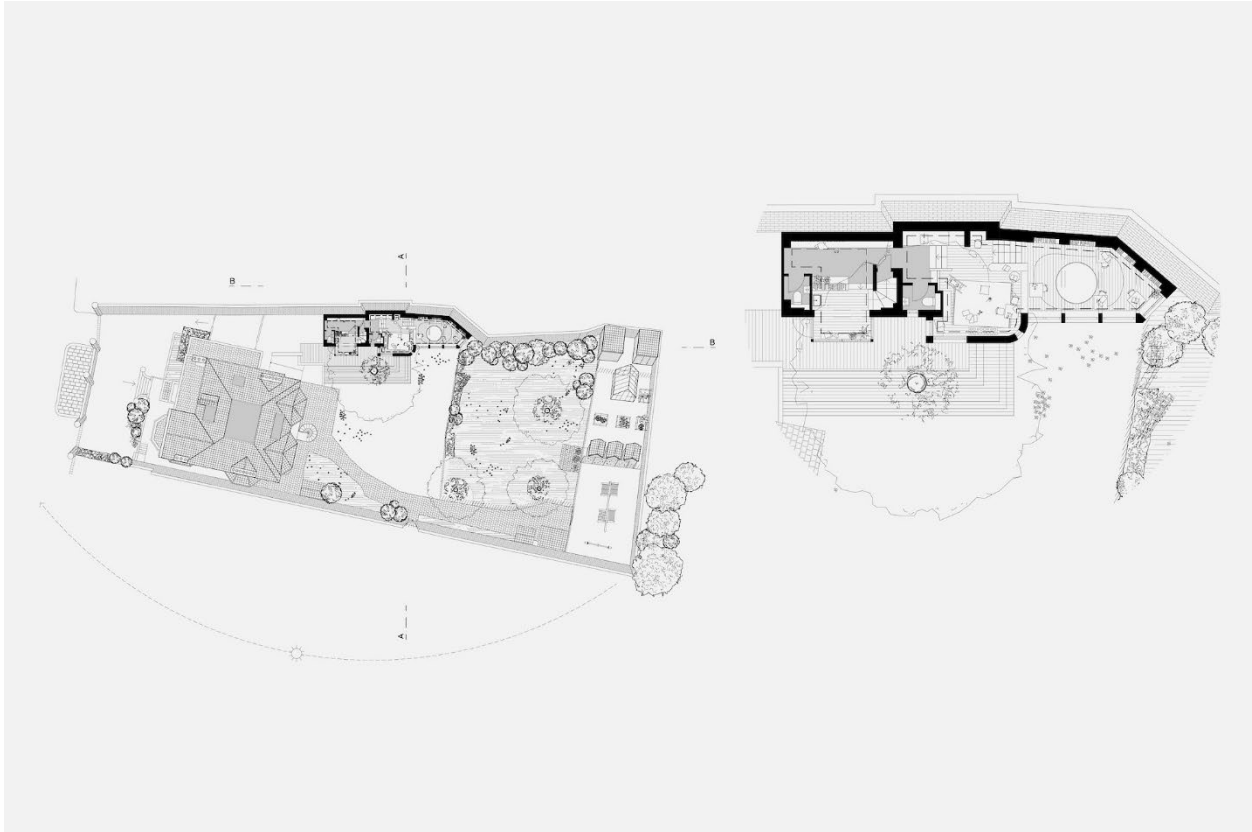


Figure 8 – Maria Montessori School Hampstead, England  
(Source: Montessori Architecture)

### 3.6.2. Apollo School – Amsterdamse Montessori School

Location: Amsterdam, Netherlands

The Apollo school located in Amsterdam was commissioned to be a collective of two schools, one a conventional elementary school and the other would be a Montessori school. This campus spans 3070 square meters. Completed in 1983 these schools were designed by Harmen Hertzberger, Henk de Weijer and Jan Rietvink and were meant to be cohesive in the sense that the materiality used was very similar but still had nods of different detailing to reflect the different teaching approaches. This school is a great example of use of the fundamentals highlighted in this thesis project. For example the use of interconnected spaces, compression and expansion and natural light (*Montessori Architecture – Amsterdamse Montessori School (Apollo Schools)*, n.d.).



Figure 9. Apollo Schools  
(Source: Montessori Architecture)



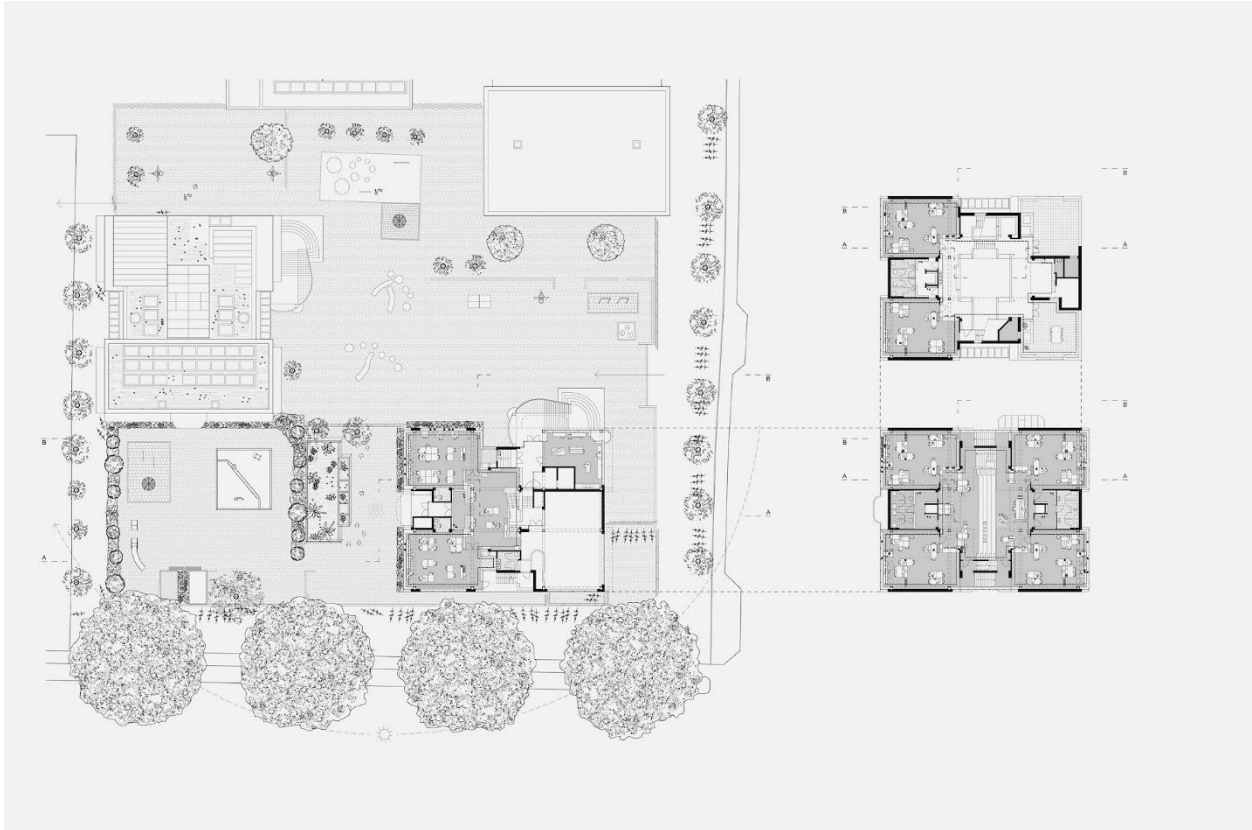


Figure 10. Apollo Schools Plan  
(Source: Montessori Architecture)

### 3.7. Detailed Space Program

For the design of this thesis, there were a multitude of concepts that were taken into consideration when it came to the program of the design. The first concept was the idea of the piazza from the Reggio Emilia philosophy. The piazza created the starting point for spaces in this design and would have all supporting spaces surrounding it. A greeting space is necessary for parent teacher contact as well as storage for coats and bags. Other spaces that were necessary were the classroom spaces. This design housed a total of six classrooms that include restrooms and running water within each classroom space. A kitchen would allow for students to acquire and build upon culinary skills as well as create another social space for students. And finally a

multipurpose workshop for students to build upon other skills and allow for a change in the environment.

## 4. Results and Conclusion

### 4.1. Project Description

Square Footage: 10,153 sf

Location: Boston, Massachusetts

Typology: Montessori School

When it comes to the architecture, there were several factors that needed to reveal themselves within the design. Using fundamentals demonstrated in the *Montessori Architecture: A Design Instrument for Schools* from the Association Montessori Internationale and the Aurthur Waser Foundation. This guide houses not only twenty-eight patterns found in Montessori Schools but also examples of schools successful in providing students with an environment that allows them to create their own path.

Some of the core fundamentals that were chosen to interpret into the design are the use of natural light, multiple levels, compression and expansion, the melting of a barrier between inside and out and Entering from the East. Now this last one is a representation of the inclusivity of Montessori. Meaning that no matter the culture, race, or faith the sun rises in the East for everyone.

### 4.2. Project Objectives

Through the use of educational models such as Montessori and Reggio Emilia, the objective of this thesis is to design a model educational center that creates an atmosphere that is not only productive but invites children to explore the world around them. This objective was achieved by critiquing the history of modern-day education and the Eidetic.

The utilization of *Montessori Architecture: A Design Instrument for Schools* to study, take inspiration and develop ideas based on the fundamental patterns illustrated. Alongside this, inspiration was drawn from Montessori lessons (*Montessori Architecture – Home*, n.d.).

The use architectural tectonics to create a metaphor for the dissection of lessons into building blocks that are reinterpreted into other lessons and skillsets.

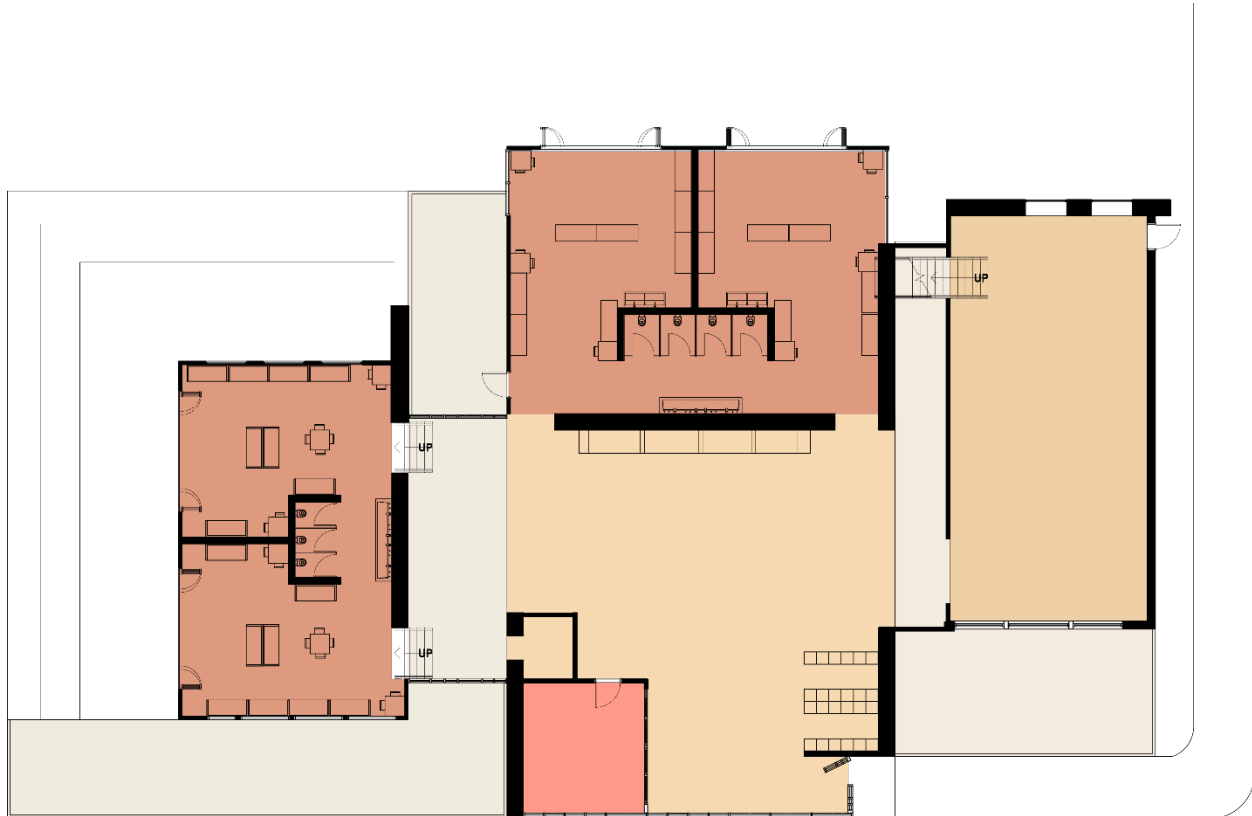
### **4.3. Project Design and Documentation**

The initial design of this thesis revolved around the centralized piazza space. Creating a rotunda of classroom spaces surrounding it. Though, through more research and design development the perspective of the design shifted. Secondary spaces still revolve around this centralized piazza space allowing children to interact with one another. However unlike the original design this final iteration is much more connected. Connectivity is one of the largest aspects of this design. It was mentioned earlier that tectonics play a role in the lessons Montessori teaches, including the bleeding paper activity which in a broader context is showcasing how Montessori lessons can be broken down into building blocks of education. When they are apart, it could be a single skill, but when you put the blocks together you build the foundations of education. In relation to the design, the bleeding tissue paper activity inspired form by the use of tectonics in architecture. Simple aspects of the design being brought together to show the overall context of the design inspired by the bleeding tissue activity.



Figure 11. Bleeding Tissue Paper Activity  
(Source: Children's Montessori Fargo)

For this design having minimal doors, interconnected spaces are evident as seen in figure 10. Individually the spaces allow for skills to be developed but when you put them all together that's education as a whole. The Entirety of the design spans over 10,000 sf, houses six



classrooms, each with it's own bathroom and water access. A greeting space, kitchen space and workshop act as support spaces.

Figure 12. Floor Plan

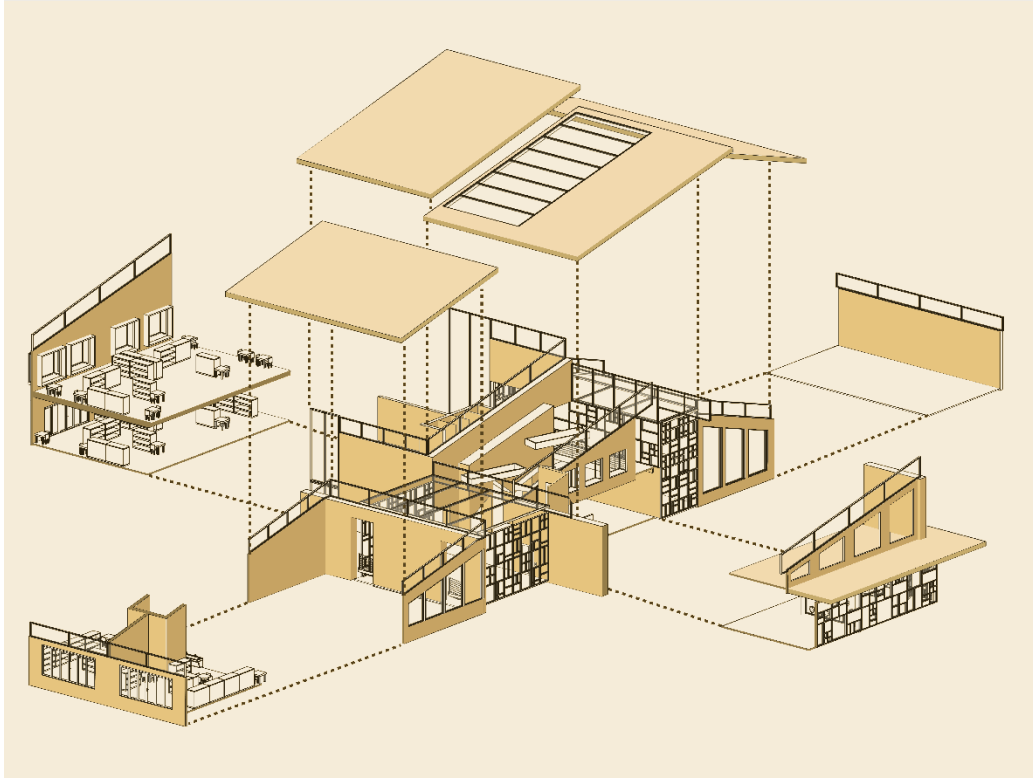


Figure 13. Axon

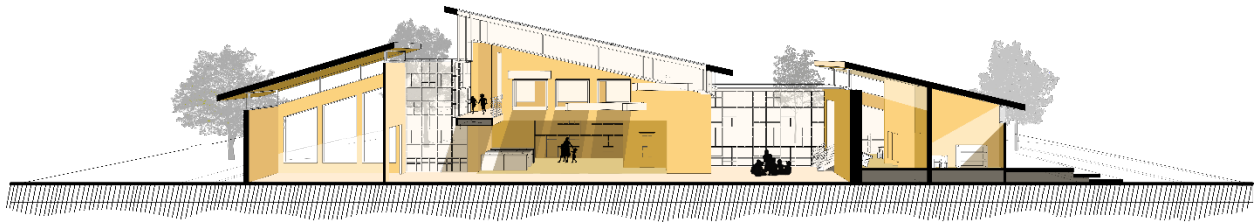


Figure 14. Section Perspective



Figure 15. Site



#### 4.3.1. The Greeting Space:

A hierarchy of connected spaces starting with the greeting space. This space is where the children begin their day. It is meant to be open and inviting which relates back to the fundamental of the greeting space in Montessori. In Montessori design, the entrance to a school is to be oriented to the East. This is a metaphor for the inclusivity of Montessori philosophy which states “Regardless of culture, religion, ethnicity or geographical location, for every human being on this planet, the sun rises in the east.” (*Montessori Architecture – Orientation of the Entrance...towards the Morning Sun*, n.d.). This is done so that every morning as children enter the school, they are drenched in sunlight which is supposed to emulate their day beginning on a positive and happy note.



Figure 16. Greeting Space

### 4.3.2. The Piazza

The piazza is meant to be a mixed-use multi-purpose space that's ultimate goal is to allow for social interaction between students. The space is wide open to allow for a range of activities. Alongside this aspect is the use of natural light and materials in the space. Natural light hosts endless benefits in a learning environment from productivity to mental healthcare.

Windows and skylights to the outside world are not only to boost the mood of the children but to also emulate the feeling of being outside especially during inclement weather. Natural Materials also play a huge roll in the design as they help to develop cognitive function in children by allowing them to experience new textures. The materials also create a learning opportunity.

“Absorbing information, as they do, through touch, children are highly attuned to the tactile quality of the building surfaces around them.” (*Montessori Architecture – Use of Indigenous Materials...with an Appreciation of Tactile Qualities*, n.d.).



Figure 17. Piazza View



Figure 18. Piazza View



Figure 19. Piazza View  
**4.3.3. The classroom**

In a Montessori classroom environment, everything is at the scale of the child. This allows for children to be autonomous when working with the activities and lessons they choose.

Not only are all materials at the level of the child, so are the restrooms. Within each classroom is a connected restroom allowing children easy access to the bathroom when they need to go. Finally each classroom has direct access to a sink and running water. Having running water in a classroom is important in the sense that children are working on activities that require clean up but also are responsible for washing dishes after snacks and meals.



Figure 20. Classroom

#### **4.4. Project Conclusions**

In conclusion, the overall design reflected the principles of Montessori and the Reggio Emilia philosophy of learning and reached the objective it was intended to. There is, however, room for future exploration as will all things. Architectural tectonics were explained earlier in the project explaining the pulling apart and reconfiguring of spaces to build up the overall design, like in Montessori lessons that can be broken down into smaller lessons or put together to create others. This is where, rather than designing one building that solves all, a multitude of

spaces or rooms could be designed to create a pattern in which Montessori directors could choose which spaces they feel would best suit the needs of their students and environment.

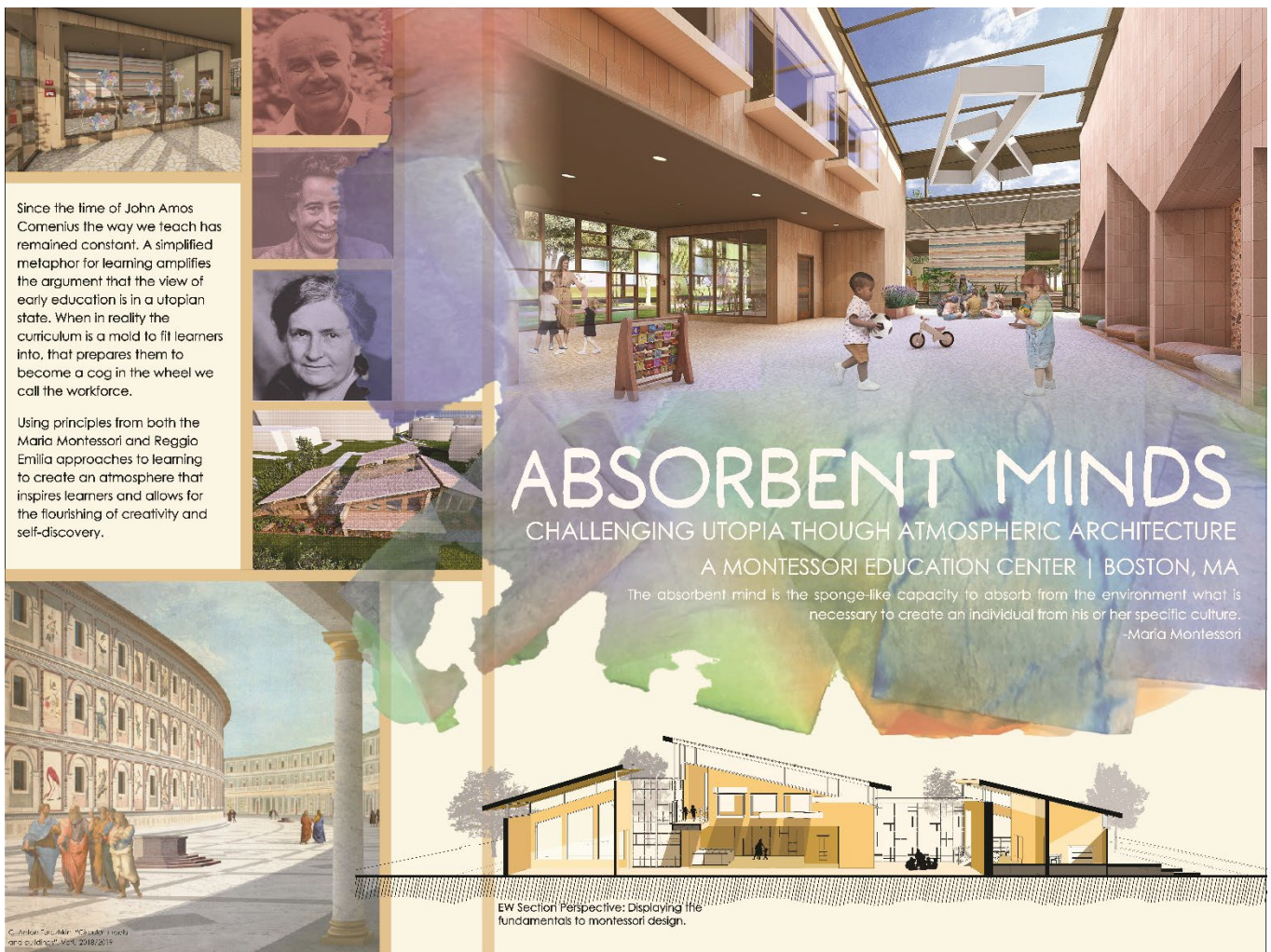


Figure 21. Board 1

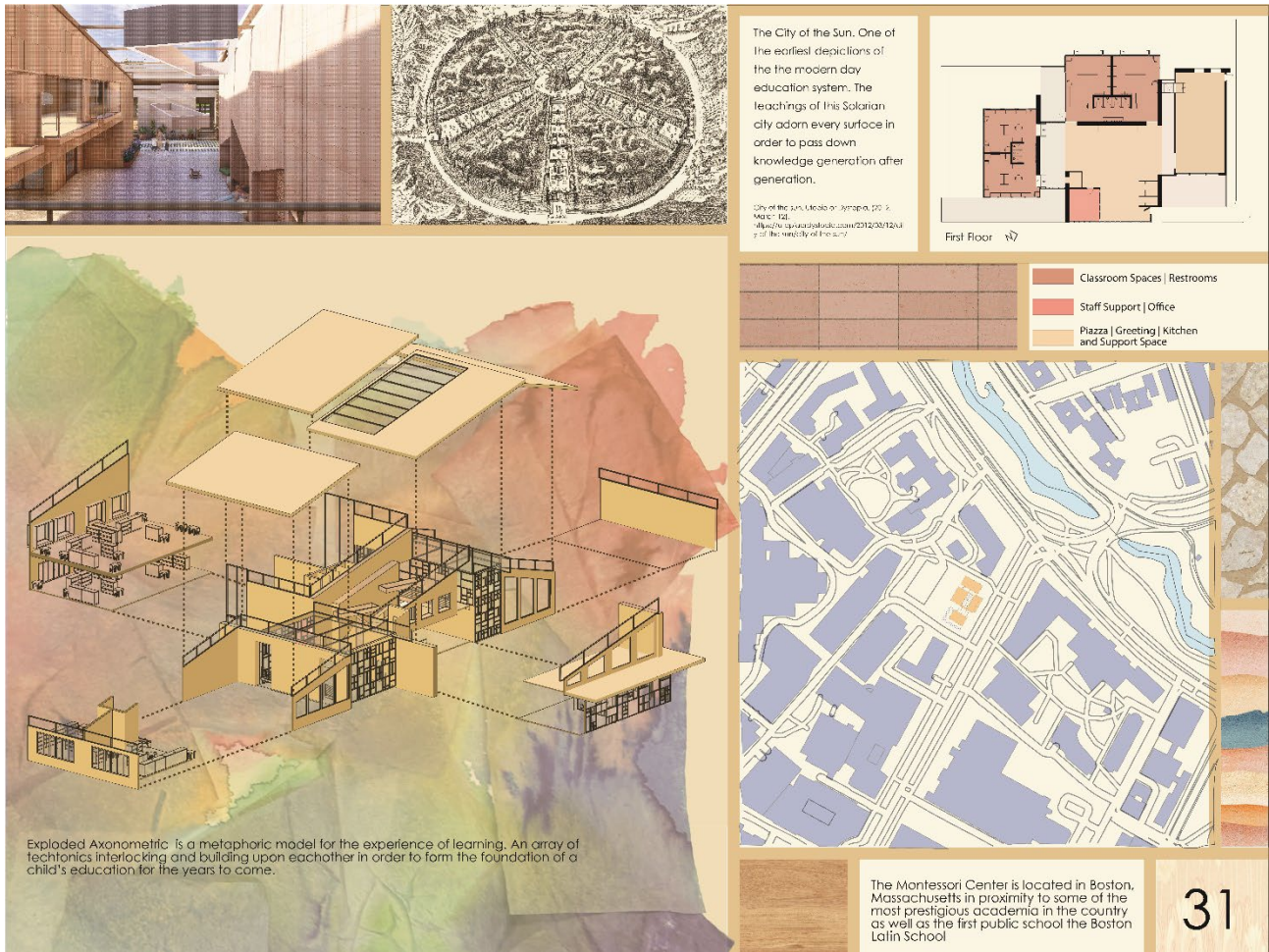


Figure 22. Board 2

## REFERENCES

- Apollo Schools - Amsterdam, Netherlands*. (n.d.-a). Montessori Architecture. Retrieved 2024, from <https://montessori-architecture.org/repertoire/apolloscholen/>.
- Arendt, H. (1961). *The Crisis in Education* (p. Chapter 5). Penguin Publishing Group.
- BLSA: Boston latin school - boston latin school association*. BLS. (n.d.). <https://www.bls.org/>
- Boston Latin School. (n.d.). Boston Latin School. Retrieved 2024, from [https://www.bls.org/apps/pages/index.jsp?uREC\\_ID=206116&type=d](https://www.bls.org/apps/pages/index.jsp?uREC_ID=206116&type=d).
- Calvino, I. (n.d.). *The City of the Sun*. David Prashker's Private Collection. Retrieved 2024, from <https://davidprashkersprivatecollection.blogspot.com/2014/09/cities-of-sun.html>.
- Ceramics, S. (n.d.). *Juhani Pallasmaa*. Solus Ceramics. Retrieved 2024, from <https://solusceramics.com/home/in-conversation-with-juhani-pallasmaa/>.
- City of the sun*. Utopia or Dystopia. (2012, March 12). <https://utopiaordystopia.com/2012/03/12/city-of-the-sun/city-of-the-sun/>
- Collins, S. (2008). *The hunger games*. Scholastic Press.
- Dictionary.com. (n.d.). *Eidetic definition & meaning*. Dictionary.com. <https://www.dictionary.com/browse/eidetic>
- Editorial Overview – issue 18*. Reimagine Education Awards & Conference. (2021, February 5). <https://www.reimagine-education.com/18-editorial-overview/>
- Encyclopædia Britannica, inc. (n.d.). Encyclopædia Britannica. <https://kids.britannica.com/students/article/John-Comenius/273749>
- Foster, A. (2023, November 14). *Who is Loris Malaguzzi?*. St Nicholas – Early Education, OOSH & Pathways. <https://stnicks.org.au/news/who-is-loris-malaguzzi/>
- Gigante, G. (2019). *Piazza*. Meer.com. Retrieved 2024, from <https://www.meer.com/en/57069-the-piazza>.
- Goodreads. (n.d.). *Chora 6: Intervals in the philosophy of Architecture* (v... Goodreads. <https://www.goodreads.com/book/show/11198765-chora-6>

Gómez, P. A., & Parcell, S. (1994). *Chora: Intervals in the philosophy of Architecture*. Published for the History and Theory of Architecture Graduate Program, McGill University by McGill-Queen's University Press.

Hannah Arendt  
forfatter  
1906 i Linden, Vis alle bøger af denne forfatter, & Hannah Arendt (f. 14. oktober 1906 i Linden. (2024, January 4). *Hannah Arendt*. Forlaget KLIM.  
<https://klim.dk/forfatter/hannah-arendt/>

Vis alle bøger af denne  
Hannah Arendt (f. 14. oktober

Helpful Professor Explains! (2023, November 21). *Montessori vs Reggio Emilia Education (4 key differences)*. YouTube. <https://www.youtube.com/watch?v=LKjOuKo8tvo>

Images, G. (n.d.). *Maria Montessori*. Biography.com. Retrieved 2024, from <https://www.biography.com/scholar/maria-montessori>.

James, W. (2023, June 21). *He is one of the world's thought heroes: Who is Tommaso Campanella?* Knowwhois. <https://knowwhois.com/post/who-is-tommaso-campanella>

Pallasmaa, J. (2010). *In Praise of Vagueness: Diffuse Perception and Uncertain Thought*. University of Texas, Austin.

Kollidas, G. (n.d.). *John Amos Comenius*. Britannica Kids. Retrieved 2024, from <https://kids.britannica.com/students/article/John-Comenius/273749>.

*The Labyrinth of the World and the Paradise of the Heart*. (n.d.). Hotel Prague City. Retrieved 2024, from <https://www.hotelpraguecity.com/fotky/okoli/labyrint.html>.

*Loris Malaguzzi*. (n.d.-a). Reggio Children. Retrieved 2024, from <https://www.reggiochildren.it/en/reggio-emilia-approach/loris-malaguzzi/>.

*Maria Montessori School - Hampstead, England*. (n.d.-b). Montessori Architecture. Retrieved 2024, from <https://montessori-architecture.org/repertoire/maria-montessori-school/>.

Montessori architecture. (n.d.). <https://montessori-architecture.org/repertoire/maria-montessori-school/>

Moran, J. (n.d.). *Education as a Machine*. Reimagine Education. Reimagine Education. Retrieved 2024, from <https://www.reimagine-education.com/18-editorial-overview/>.

Polizzi, D. (2019, October 14). *The Piazza*. Meer. <https://www.meer.com/en/57069-the-piazza>

Prague Book - Labyrinth of the world and the paradise of the heart. (n.d.). <https://www.hotelpraguecity.com/fotky/okoli/labyrint.html>



Powers, J. (2011). Utopian Knowledge: Eidetics, Education and the Machine. In P. Gomez & S. Parcel (Eds.), *Chora Six: Interval in The Philosophy of Architecture* (6th ed., pp. 229–248). McGill-Queens press.

*Reggio Emilia Approach*. Reggio Children. (n.d.-b). <https://www.reggiochildren.it/en/reggio-emilia-approach/>

Roth, V. (2014). *Divergent*. Thorndike Press, A part of Gale, Cengage Learning.

Sicari, C. (2018). *Tommaso Campanella*. Altritaliani.net. Retrieved 2024, from <https://altritaliani.net/tommaso-campanella-costruttore-di-storia-a-450-anni-dalla-nascita/>.

*What is montessori education?*. What Is Montessori Education. (n.d.). <https://amshq.org/About-Montessori/What-Is-Montessori>

Who was Maria Montessori? (n.d.). <https://amshq.org/About-Montessori/History-of-Montessori/Who-Was-Maria-Montessori>