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Environmental Geography Seminar  
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## **Plants in the Atrium**

### **Summary:**

One of the things that many people enjoy here on Ohio Wesleyan University Campus is the amount of greenery that we have here. This is not surprising, seeing the effect that plant life has on the local environment. Not only do they absorb CO<sub>2</sub> into themselves and boost our environment with oxygen, but they also provide a sense of peace and tranquility to anyone who really takes the time to look at it. Almost every home in America has either a flowerbox or a garden, or a lawn of green grass and flowers, designed to beautify the house and give a sense of comfort to passerby.

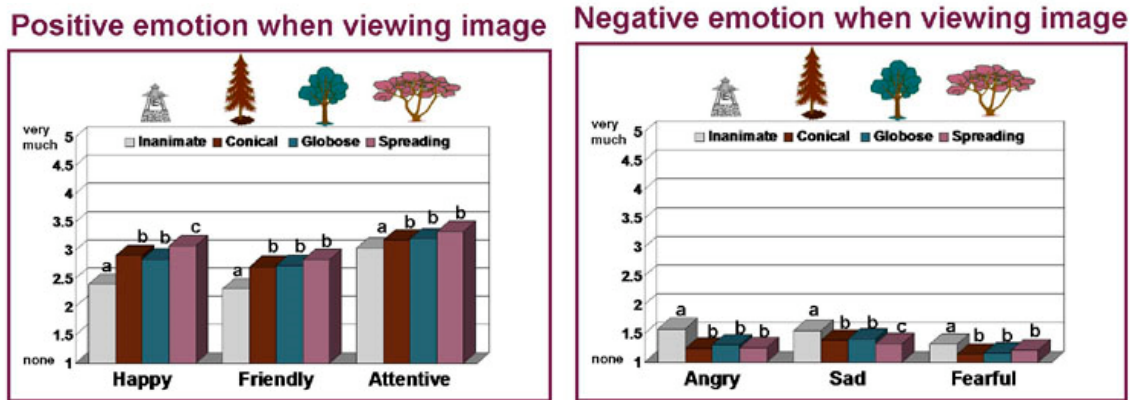
Indoor plants are nothing new to our society, for many years now we have been attempting to move plants indoors to produce the same affect that they do outside. In recent times, the popularity of indoor plants has increased greatly, especially in workplaces. Studies have shown that adding indoor plants to an office improves both the mood of the workers, and the quality of the work they accomplish. A person that works with a plant in the room tends to feel better than a person working with no greenery nearby, and his work effort is more productive.

The purpose of this project is to try to place plants into the atrium of the Science Center, because many students believe that the presence of a little greenery in the science center will have a positive effect on the students who attend classes there. While it is true that there are already plants in the science center, they are located in places that are not easily visible to students. Many are not even aware that there are living plants in the science center at all. The original plans for the science center actually included placing plants in the atrium, but for

reasons unknown the idea was dropped. The purpose of this project is thus, to make up for that mistake.

The benefits of adding plants to the science center atrium are numerous. Not only will we have a constant source of clean air, but it will also enforce a relaxing feeling amongst the students.

According to surveys conducted by Washington State University, people have varied reactions to things like tree color and smell. The graph below shows how people react to different kinds of trees.



According to the graph, the presence of trees has increased the attentiveness of students, meaning that they won't be falling asleep, as well as calms their overall mood, replacing the anger and sadness with a calm sense. Since the science center atrium is a popular place for students to wait before classes, the presence of trees there could help students relax during stressful periods like finals, as well as help them to prepare for the class ahead. During tests performed at the university, students reported a drop in stress, as well as an increase in level of productivity.

Indoor plants also have a positive effect on the air inside a building. The science center, like many modern buildings, has a closed air system since the windows do not open. The presence

of indoor plants leads to a decrease in dust levels because the plants remove particulate matter. They also filter CO<sub>2</sub> from the air, which has found to decrease work ethic if left in a room for too long. Plants also filter out other chemicals from disinfectants and cleaning solutions, leaving the air with a fresh, earthy smell. Some plants, like the Boston fern, are capable of filtering out specific pollutants better than others, for example, the Spider plant is known for being able to remove massive amounts of carbon monoxide from the surrounding air.

**Ideas:**

I have three ideas as to placing plants in the Science Center Atrium.

My original idea was to use indoor trees in mobile plant bases like these.



These plants would be easy to move, and so the staff can shift them when they are preparing the atrium for a big event like President's Ball, or a banquet. Because they are at eye level, it may also have a faster affect on the students because they see them. They can also be used to decorate dark corners or be placed right outside classroom doors for better effect. However, I'm actually going against this idea now, primarily for the reason that there is no where to place these plants when there is a special event. Upon looking at the floor plans used by the grounds staff for special events, there are few places that a plant can be placed during an important event. It is important that these indoor trees not interfere in the events that are held in the

atrium, and I fear that moving the trees every time will become a source of annoyance for the staff.

My second plan was to use a vertical planting system I had read about online. This project would be able to take advantage of the horizontal space on the atrium walls, which have hardly anything on them. This idea would in a sense, turn the walls of the atrium into “green” walls, with plants right on the sides (as seen below). The planters that they use are mold resistant and self watering. Pour water onto the top row, and it trickles down and waters all the plants by itself. While I think this plan would be very successful, there are a number of problems with it. One of the main concerns I have is cost. The walls of the atrium are huge, and just covering one wall would be an expensive task. In order to turn at least one wall into a “living wall would require over \$1,000 just to purchase the necessary frame and planters. Then there are the plants to purchase and the accessories. (See plants on the wall website)



My last idea would be much simpler, to place some hanging boxes on the railings of any balconies that overlook the atrium. Though the students may not see them as easily, I believe it will still have a calming effect on them. Judging by light readings that I have done, the best place to hang these baskets would be on all levels by the elevator and on the railings at the student rest areas on the 2<sup>nd</sup> and 3<sup>rd</sup> floors.



### **Kinds of plants**

The kind of plants that would be placed in the atrium would depend on which plan is followed through, as well as by the amount of light and water that each plant requires in order to thrive. The term of location is also important, as different areas of the atrium receive more direct light than others.

For example: the Dracaena plant is known for its ability to clean air very well, but it requires indirect light and moist soil. I would say it could be used for hanging on the third floor, but it would probably not do well in the atrium.



The Ficus tree is not one I would recommend using in the atrium because of its habit for shedding leaves if it is disturbed too much. Perhaps it could be placed in hanging boxes, as the bonsai form of this tree is easy to maintain.



Dieffenbachia is a species I would not recommend using because even though it can survive in the shade, it requires frequent watering, something that may add more stress to the grounds staff. Also, this plant prefers humid climates which are hard to achieve in Ohio.



The Parlor Palm is a possibility for the Atrium because it can grow in low-light places, meaning that it can be placed in a location out of the way, and still be healthy. This plant can reach 6 ft in length, so place it in a tall area.



The Norfolk Pine Tree might be a good choice for the atrium floor due to the fact that they are commonly used as houseplants. Not to mention that the scent of pine trees tends to relax a lot of people. However, they can cause great illness in a person who has an allergic reaction



The Spider plant would make the ideal candidate to use in hanging baskets. It does not get much bigger than 24 inches in height, and has been shown to greatly affect air pollution levels around it.



The Boston fern is another ideal candidate because it grows well in medium light, and is able to remove mass amounts of Xylene and other chemicals.



**Cost:**

The costs for each of my three plans varies greatly, depending mainly on what species of plants you decide to purchase.

Idea 1: (These prices come from an online store)

Ficus tree: \$59.99

Dracaena: \$13.00

Parlor Palm: \$50.00

Diffenbachia: \$42.00

Norfolk Pine: \$40.00

Spider Plant: \$24.00

Boston fern: (small version) \$10.00

Idea 2: (These costs come from the Plants on the Wall website)

Living wall frame: depending on size, anywhere between \$200 and \$1,000

Plants: \$18.00 each

Water filtering system (optional): \$520.00

Idea 3: (Prices are according to Hooks and Lattice Garden Market)

Hayrack-style planters: \$44.85

Cotton-weave style planter: \$41.85

Railing brackets: \$12.85

### **Cons:**

As you can imagine, though the idea of placing plants in the science center atrium seems easy, there are, problems that need to be discussed first before you can install the plants. One particular problem is the fact that the presence of plants raises the humidity levels of a room. While this is not too much of a problem, higher levels of humidity and moisture in the air are often correlated with an increase in mold development. Seeing as how mold can be very damaging to people who are allergic to it, the potential for mold may end up being greater than our desire for keeping indoor plants. Since the science center has a closed ventilation system, once mold appears, there is no stopping it.

Other problems with plants include pests that may take refuge in them, or the fact that some plants can be poisonous if touched or eaten. Great care has to be used when selecting plants. There is also the task of caring and maintaining the plants. Some species of indoor plant require more water than others do.

I am really hoping that this project can someday be achieved by the university. We need plants in our working environment, not just to maintain a good environment, but for mental and health reasons as well. Based on research done in other schools, combined with the original plans for the science center, I feel confident that the adding of plants to the science center atrium will greatly improve the environment of the teachers and students there.

### **Contacts**

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### Sources:

1. Report created by Ali Samir Oosman and Sayan Ghosal, which dictates not only the pros and cons to having plants in the atrium, but also recommends species of plants that could thrive in the atrium, as well as the contact information for local nurseries
2. Plants on Walls website: [http://www.plantsonwalls.com/?gclid=CJP\\_zaeLrasCFYjBKgodwVsSjg](http://www.plantsonwalls.com/?gclid=CJP_zaeLrasCFYjBKgodwVsSjg)  
This website talks about the pros of installing a vertical garden, which include how to set them up and how to take care of them
3. Interiorscape Integrated Pest Management; this website talks about the light requirements that indoor plants need. This will come in handy when it is time to choose what species of plants to place in the atrium. <http://ipm.ncsu.edu/InteriorScapes/PLNTMGMT.html>
4. Bachman's Floral Gifts and Garden; this website offers advice on indoor trees, which I was originally looking into. If I decide to stick with plants in movable bases, I will go with indoor trees. [http://www.bachmans.com/Care-Handling/Plants/divHomePage.html?cnb=Plants&categoryCode=01&pageIndex= pageIndexToken\\_largePlantsandIndoorTrees](http://www.bachmans.com/Care-Handling/Plants/divHomePage.html?cnb=Plants&categoryCode=01&pageIndex= pageIndexToken_largePlantsandIndoorTrees)
5. "Benefits of plants" from Washington State University; this report talks about the responses that people have to the presence of indoor plants. <http://public.wsu.edu/~lohr/hih/>
6. Tropical-Rainforest-Animals.com; this website has an interesting article about air pollution, describing its causes. It mentions indoor air pollution, which I think may soon become a problem in OWU. <http://www.tropical-rainforest-animals.com/air-pollution.html>
7. "An Engineering approach to controlling indoor air quality" By James E. Woods; this article talks about how plants can be used to improve the air quality inside a room or building. <http://www.jstor.org/stable/3431100?&Search=yes&searchText=indoor&searchText=plants&list=hide&searchUri=%2Faction%2FdoBasicSearch%3FQuery%3Dindoor%2Bplants%26acc%3Don%26wc%3Don&prevSearch=&item=8&t=2996&returnArticleService=showFullText>
8. "Fungal Spores, Hazardous to health?" By W.G. Sorenson; this article talks about mold and other fungus spores, and how they affect people. This is important because mold is a key problem I face in my project. <http://www.jstor.org/stable/25071012?&Search=yes&searchText=mold&searchText=indoor&searchText=plants&list=hide&searchUri=%2Faction%2FdoBasicSearch%3FQuery%3Dindoor%2Bplants%26mold%26acc%3Don%26wc%3Don&prevSearch=&item=7&t=186&returnArticleService=showFullText>