

# Higher Education: An In-Depth Examination of Existing School Rooftop Structures and Implementation in Public Schools

Maria Jesko, Pete Ed Garret  
Kempner High School, Sugar Land TX  
Studio Red Architects, Houston, TX  
Gifted and Talented Mentorship Program, Fort Bend ISD, TX

## Abstract

I plan to survey the students of IWA to prove the positive effect of community rooftop areas on the student body. I will also survey FBISD students to demonstrate desire for these community spaces to be expanded or recreated. I will then use the skills I have learned at my mentorship to design a prototype rooftop recreational space keeping in mind safety, cost, feasibility, mental health resources and benefits, and the ability to duplicate the design to all schools in the district.

## Introduction

I became interested in the idea of incorporating rooftop balconies as places of community and enjoyment of nature. More importantly, the balconies offered a breath of fresh air, the benefit of which is not just a common wives' tale. In fact, according to Margarita Triguero-Mas and colleagues, "Natural Outdoor Exposure contact, especially surrounding greenness, was statistically significantly tied to better mental health. There were indications that these relationships were stronger for males [and] younger people." [1] Furthermore, communal spaces within schools foster better school spirit and enjoyment and pride in the school. Communal spaces like recreational rooftop structures can also become safe spaces with positive benefits on mental health. Specifically, Salima Meherali and her colleagues found that safe community spaces with mental health resources—which can include natural outdoor exposure—had many positive outcomes including "reduced posttraumatic stress disorders, anxiety, and substance use, along with improved mental well-being and interpersonal relationships." [2]

## Method

The research will consist of two separate polls to gather data.. The first poll was made for the Incarnate Word Academy students who have a roof patio. The survey covers usage, safety, overall enjoyment, and asks responders for possible improvements. While enjoyment polls will be used to predict demand and necessary sizing, the safety data will help schools make an informed decision about implementing the structure. Finally, the answers about possible improvements will be addressed when a prototype is designed for FBISD Schools. The second survey is for FBISD students, and its purpose is to gauge interest in this new possible school amenity. By containing questions about prospected usage, this data will further provide sizing details for the design process. Furthermore, using suggested improvements from the first poll, FBISD poll asks which of the improvements would be the students' highest priority to implement.

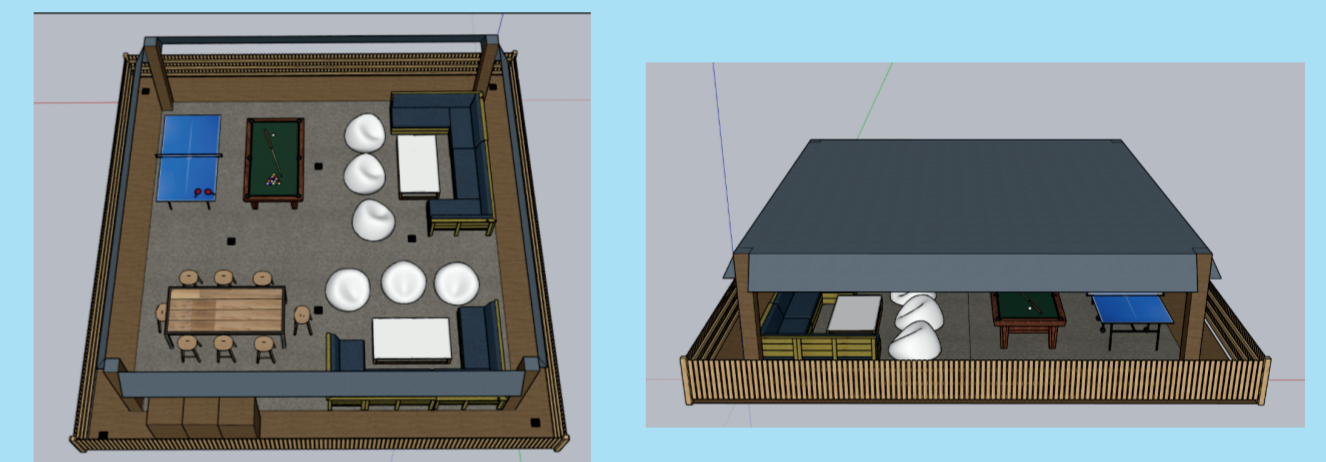
## Results



## Findings

Only seniors at IWA were surveyed because the school only allows patio access as a senior privilege. At first, the average rating of using the roof patio rather unfrequently may seem like a patio would be a poor investment. However, students explain that there are rules limiting their usage, and they would use the patio more often if permitted. The most common use of the rooftop patio at IWA is school events. This can be a selling point to FBISD that a patio would encourage school spirit and community, the benefits of which are expanded upon in the introduction. Additionally, 100% of the students agreed that the patio does indeed foster community and spirit. With safety being educators' top priority, students were asked to rate how safe they felt on the roof. 75% of the responses indicated the highest feeling of safety, however the prototype will be sure to include fencing and preventative measures to make sure the students are in no danger whatsoever on the roof. Lastly, IWA students were asked to address possible areas of improvement to their facility that could be implemented in the prototype. The most common answers were shading, ventilation, followed by comfortable seating and snacks. Not surprisingly, FBISD students overwhelmingly responded that they would be interested in a rooftop patio. When asked how often they would use the facility, responses were roughly split into a third responding daily, weekly, and monthly. This will probably be helpful when schools need to decide how much space they would like to use for the rooftop patio. The prototype is the size of a classroom, but it can be duplicated and combined if a school has the funds, and demand for a larger space. Furthermore, the highest priorities of Fort Bend students were ventilation, shading, and comfortable seating, all of which have been included in the design.

## Prototype



## Discussion

First, one may notice the fencing surrounding the structure. This is a safety precaution to stop falling from the roof. One of the biggest issues in an outdoor structure is protection from the elements. For this reason, drains have been installed, and the roofing is made of the material that you may normally see shading playgrounds. Named High-Density Polyethylene, this material stops 97% of harmful UV rays, and lowers temperatures beneath it up to 25 degrees. It also protects from the rain. Drains stationed around the structure also serve to eliminate flooding on rainy days. Cabinets are included to house removable cushions from the couches as well as game supplies. All other heavy furniture and flooring is waterproof. The layout provides an obvious flow of traffic as well as common areas for play or study.

## References

Triguero-Mas, Margarita, et al. "Natural outdoor environments and mental health: Stress as a possible mechanism." *Environmental research* 159 (2017): 629-638.

Meherali, Salima, et al. "Safe spaces for youth mental health: A scoping review." *Plos one* 20.4 (2025): e0321074.