Thesis Project Portfolio

Measuring Airport Similarity to Create a Towering Decision Aid

(Technical Report)

Exploring the Possibility for the Integration of Contemplation in Academic Environments to Enhance Collaboration

(STS Research Paper)

An Undergraduate Thesis

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Table of Contents

Sociotechnical Thesis

Measuring Airport Similarity to Create a Towering Decision Aid

Exploring the Possibility for the Integration of Contemplation in Academic Environments to Enhance Collaboration

Prospectus

Sociotechnical Thesis

Addressing a change in a current status quo that appears to be working sufficiently requires one to disrupt the accepted situation with ideas for improvement. Both of my theses address a change in status quo: one upheld by administration standards and one by societal standards. The key objective in researching the criteria around establishing an Air Traffic Control Tower (ATCT) and incorporating contemplation in academic spaces is to test the benefits around adjusting the status quo and establishing an improved culture.

The technical thesis focuses on creating an interface that allows smaller airports to compare their data to similar airports in order to assist in the towering decision-making process. ATCTs help prevent collisions and manage efficiency around airports. The FAA outlines the criteria for funding an ATCT in the FAA-APO-90-7 (Martin, n.d). The current criteria surrounding the cost-benefit analysis are outdated and biased against smaller airports that may benefit from an ATCT. Therefore, our objective was to establish a new cost-benefit analysis and aid smaller airports in their decision to tower or not to tower. We were successful in collecting and compiling efficiency, economic, and safety data on 228 airports. We performed PCA and hierarchical clustering analysis to determine similarities between airports in terms of our metrics. The interface allows the user to select an airport, adjust the metrics to a beneficial balance, and see background statistics and similarities between airports. The interface aids the user in the decision to build a tower as they gain a better insight of the potential benefits of an ATCT.

The STS thesis focuses on the benefits of and controversies around creating a space for contemplative practices in an academic setting. Contemplation and self-awareness are valuable assets that allow one to focus on his/her own mental health, and additionally, enhance

collaboration with others (Hougard, Carter, and Afton, 2018). While the main focus of the schooling system is academic excellence, we should also focus on shaping the well-being of the whole person so that they are better able to succeed in the long-run (Peterson, 2006). The objective of my research is to intentionally reshape the academic space to encourage more self-awareness. My research found that collaboration improves when students are more mindful and self-aware because of an increase in conscious behavior. However, I have to be mindful that the space will not turn into another hollow, eastern appropriated space. My research recommends a continued development of mindful practices in the academic space in order to cultivate a knowledgeable and aware student.

Both projects set out to reestablish the status quo in separate focus areas. While the research and results of each project were successful, it will be interesting to see if airports are able to use this tool to their benefit and if students to utilize this productive space and create a new academic culture. I would recommend that further research be implemented on the new contemplative spaces at the University of Virginia as a test case for the culture change and acceptance of mindfulness.