SP[A.C.E.]: STUDENT'S PERSONAL ACADEMIC COLLABORATION ENVIRONMENTS

By

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Date approved:_______________
Abstract

This project seeks to discover where students living in the dorms currently perform academic collaboration. Academic collaboration is the methods students use to study and get the most out of their academic career. The interactions this project will focus on will be those between the student studying as an individual, the student studying in a small group, and the student studying by using technology. This information will then be used to see if there is a way to create a physical space or environment, possibly a "third place," and an application that would better facilitate this interaction.

This research will take into account how students use place-making to define their own space, as well as how involving students in the design process through participatory design, will aid in the student claiming ownership of that space.

Two Supplemental Files accompany this document: Fieldnotes and Presentation.
Acknowledgements

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1. Introduction

1.1 General Topic

The general topic of this thesis mixes interaction design methods, architecture methods, and theories that revolve around place making and attachment to create a space students, living in the dorms, could go to satisfy their need of an academic collaborative environment as a “third place.”

This topic relates to areas of place-making, “third place”, participatory design, space vs place, and academic collaboration.

1.2 Topic’s Relevance

This topic is relevant because college students need places that support both social and academic growth. By creating an environment that harbors both activities through the activity of academic collaboration you are satisfying those needs. This topic relates to studies conducted by the social sciences (sociology, psychology) and how space can affect social habits. It relates to areas in design (urban planning, architecture, interaction design) by utilizing participatory design, space vs place, and “third place” to define the different ways users become attached to an environment and quantify how they make it their own environment.
1.3 Scope of Research

The scope of this research will focus on what circumstance students, between the age of 18-30 years old, living in university dorm use to perform academic collaboration. It will be based on if the dorm satisfies their needs in a collaborative environment or if they seek shelter in other environments on campus or in Lawrence. It will then be tailored to what those environments offer and how can they be used to prototype a potential architectural solution.

The forms of academic collaboration to be addressed are student: student as an individual, student: small group (3-5 members), and student: technology.

2. Keyterms

Academic Collaboration Environments, Participatory Design, Place-making, Space vs. Place, Third Place

3. Literature Review

3.1 The Participatory Design of Space

Everyday humans come into contact with environments created based on the desires of third parties, the owners of the space and the architects. Owners elicit the help of an architect to design a space to facilitate a certain interaction. The owners approach the project with a list of their wants and needs for the space. Then the architect is left to draw inspiration from a variety of sources, past architectural
references, evidence based design, and their personal past, cover a few of the sources architects use to draw inspiration for building concepts. This method however doesn’t always account for the user using the space. “One of the hallmarks of [hu]man-environment research is the realization that designers and users are very different in their [perceptions and] reactions to environments, their preferences, and so on, partly because their schemata vary. It is thus the user’s meaning that is important, not architects’ or critics’; it is the meaning of everyday environment” (qtd. in Rapoport, 1982:16). Using the creation of Union Point Park as a case study (Hou & Rios, 2003), the participation of community members through methods of a teen workshop, public walking and boat tour site surveys, attendance of community groups, a petition drive, and an organized event the architects were able to elicit help from the future users of the space to create a meaningful environment they identified with. The end result took a little longer than expected up front but by understanding their users’ model the end product was used more by the community. In order to fully understand the users’ model of space, it has to be approached from three aspects: meaning, culture and place-making.

First, the architect must determine what the space’s meaning is for the users. According to Amos Rapoport, “people react to environments in terms of the meaning the environments have for them. One might say that ‘environmental evaluation, then, is more a matter of overall affective response than of a detailed analysis of specific aspects, it is more a matter of latent than of manifest function, and it is largely affected
by images and ideals.” (1982:13). The latent function of a space can be attributed to the activities that happen in that space. “Any Activity can be analyzed into four components:

(1) the activity proper;

(2) the specific way of doing it;

(3) additional, adjacent, or associated activities that become part of the activity system; and

(4) the meaning of activity.” (Rapoport, 1982:15).

Once the activities have been analyzed, the overall meaning of the environment will become more apparent. Not only will the architect see what activity the owner wants the space to facilitate but it also opens up possibilities to other opportunities that space may want to facilitate. Great examples of spaces that facilitate multiple activities are “third places.” Not only does the “third place” facilitate a main purpose, such as drinking coffee at a café or meeting up with friends, “the third place, [is also] people’s own remedy for stress, loneliness, and alienation” (Oldenburg, 1989:20). It provides a space that its users can use as an outlet.

Next, the architect needs to access the culture of the space. In Make Space, Doorley and Witthoft say that “space is the ‘body language’ of an organization.* Intentional or not, the form, functionality, and finish of a space reflect the culture, behaviors, and priorities of the people within it. This suggests that a space is simultaneously a cultural translator and a builder. That said, space design has its own grammar that can be tweaked to bolster desirable habits.” (2012:38). To tweak the
grammar of the space, Doorley and Witthoft suggest approaching the design of space from the 4 Attributes of Space:

(1) Places

(2) Properties

(3) Actions


“Places are broad spatial types that share an overall purpose. Properties are the specific aspects of people or space that can be enhanced or altered to impact behavior. Actions are behaviors and tasks. Attitudes are cultural values and habits” (Doorley & Witthoft, 2012:39). Once the places, properties, actions, and attitudes of a space are defined, the architect is able to see what the users do in established environments. The architect can then use this information to influence their future designs. For instance when looking back at “third places,” Ray Oldenburg did an analysis on the culture of “third places” and developed the 8 Characteristics of “Third Places”:

(1) On Neutral Ground

(2) A Leveler

(3) Conversation (main activity)

(4) Accessible and Accommodating

(5) A Group of Regulars

(6) A Low Profile

(7) A Playful Mood

(8) A Home Away from Home (Oldenburg, 1989),
Each of these characteristics offers the opportunity for innovation. As long as, the architect understands that these are the qualities that users need for a space to become a “third place” and through design doesn’t lose any of the characteristics then the user should be able to identify with the culture the created environment is intended to support.

Finally, the architect must understand how the users will establish place in the space. As Harrison and Dourish said, “space is the opportunity; place is the understood reality” (1996:67). This means that the architect provides the space but the users’ define the place through methods of place-making or “placeness”. “Placeness is created and sustained by patterns of use; it’s not something we can design in. On the other hand, placeness is what we want to support; we can design for it” (Harrison & Dourish, 1996:70). Placeness is what the user is able to bring to the space. It could be as subtle as laying a coat across a seat to claim ownership of a chair to as grand as rearranging an entire room to support an activity. If the architect can predict the users’ place-making habits then he can design for the building to afford the current habits. By affording place-making the user is able to form a sense of ownership to the space and “attachment to place is considered a basic human need.”(qtd. in Cattell, Dines, Gensler, & Curtis 2008:553).

Through the use of participatory design and user experience, architects can gain an insight into the users’ model and incorporate it into the design of buildings. Meaning, culture and place are qualities that can be used as alternative approaches to architectural design and ways of understand the users’ needs for the space.
Architecture is no longer a product of form it goes beyond and is affected by meaning, culture and place established by the users.

3.2 Academic Collaboration as a “Third Place” for Students

“Third places” are meant to build community for individuals outside of the home (“first place”) and work environment (“second place”). For a college student the “first place” is often the dorms, their “second place” is a full course load of classes at school, leaving the “third place” open for grabs. Students often will workout at the student recreation centers, have meals at the campus dining facilities, seek healthcare at the campus clinic and partake in campus organizations to fill their social life. The college campus has similar qualities to that of a small community and integration into a new community can make or break a college student’s career and boost or lower their morale. Therefore by understanding the importance of the “third place,” an environment that promotes academic collaboration can be seen as a place to support the students’ interaction with the community.

For a university to fully support the students’ interaction with the campus community they must support the bonds between students, staff, and faculty. “When students have the opportunity to interact with faculty and one another, the college experience is enhanced, thus providing deeper learning and development.” (Brandon, Hirt & Cameron, 2008:63). By increasing the opportunities for these relations to take place students are learning more outside of the classroom. Another important part of college, aside from learning, is the social development aspect of college. For most students, college is a time of defining who they are as an individual and offers the
opportunity for them to network, learn information, and connect so they are able to provide for their future.

“Social interaction is a significant determinant of graduation and student persistence rates.” (Brandon, Hirt & Cameron, 2008:65). By universities providing spaces for this interaction to take place they are not only increasing graduation rates but also their number of future alma mater supporters. Social environments are not different from physical environments, they “do not exist independently of each other; any environment is the result of continuing interactions.” (qtd. in Cattell, Dines, Gensler, & Curtis 2008:546). For college students there are two types of social environments: those that support academic learning and those that encourage socializing with friends and potential mates. All environments on campus should support these two types of interaction. However, this project is focusing on the academic collaboration interaction. Academic collaborative spaces need to build the community outside of the home like that of a “third places.”

4. Research Question

How can user experience research and architectural prototyping be used to create a useful academic collaboration environment that students living in the dorm would view as a valuable “third place”? 
5. Method

5.1 Questionnaire and Interviews

**Purpose:** Questionnaires are used to generate questions for the videoed interviews. These methods combined allow students to report on their “feelings, perceptions, attitudes and behaviors” (Martin & Hanington, 2012:140) when studying individually, as a group, and when using technology. A second questionnaire allows students to describe where they study and what they consider their three places, home, work/school and go to study spot.

**Procedure:** Nine students completed the first questionnaire. This Questionnaire consisted of about 30 questions and was used to gain information on student’s study habits. Sample questions included:

- What qualities do you need your study space to have?
- What tools or equipment do you use to study?
- What do you bring to study with you?
- What do you expect the environment to have?
- What type of work do you do when you study by yourself?
- What distracts you?

Thirteen students completed the second Questionnaire and it was used to see what places students consider to be their “three places”. Questions included:

- Why do you study?
• What do you consider your home in Lawrence?
• What is your place of work?
• What is your go to study spot?

**Results:** Both of these Questionnaires were video recorded and transcribed into fieldnotes *(see Fieldnotes for complete version)*. Example of Interview:

**Street Interviews**
These interviews were meant to be quick and informative. They happened on Daisy Hill outside of the residence halls on March 30th at 5pm. Subjects were asked three main topics to see what locations they consider to be their “three places,” home, work, and go to study spot.

**Interview 1**

Subject interviewed was female.

**Interviewer:** Why do you study?  
**Subject:** So that I will do better on tests.

I: What do you consider your place of home in Lawrence?  
S: My Dorm.  
I: What dorm?  
S: Hashinger.  
I: Do you consider the whole dorm your home or just parts of it?  
S: Just parts of it. Like the lobby and my dorm room.

I: What is your place of work?  
S: I work at the dorm.

I: What is your place of study? Where do you go to study.  
S: Usually my room or the Lobby (Fieldnotes 101).
The information collected was also analyzed and used to influence the Personas (see section 5.4 Personas) and Activity Theory Models (see section 5.5 Activity Theory Models).

5.2 Walkthrough Analysis

**Purpose:** Walkthrough Analysis allow the designer to see what spaces are available for students to use when studying in the dorm. These Walkthrough Analysis give the student the freedom to show the spaces, describe the spaces, and give both positive and negative feedback on the spaces. They also can be used as a reference to important aspects students define in the space.

**Procedure:** Students were given a camera and asked to talk about all the spaces in the dorm they are able to use when studying. Students would then take photographs of the space, talk about what is used in the space, what is not used in the space, and how often they are used.

**Results:** The Walkthrough Analysis were conducted before the interviews. They were documented and kept in the fieldnotes (see Fieldnotes for complete version).

Sample of Walkthrough Analysis:

She then told me some information about the furniture she chooses. She pointed to the multicolored square and black circle chairs (see Photograph 1) and said she chose these because they
are “separable. Each part is individually upholstered. The backs come off and can be slip covered. The arms and seat come apart, as well.” This is because students often will vandalize the furniture and she wanted to be able to cheaply replace damaged furniture. She told me that since freshmen live in this hall that she has seen students cut the furniture with knifes when drunk. She stressed that when designing for freshman you have to consider the fact that “they drink more, vandalize and will often times study less because they haven’t developed the habits that upperclassman have.” She then said she chose the wooden arm tops because that is the “area of the chair that gets the most wear.” Students put their drinks on the arm and their hands so it can dirty quickly. The next piece of furniture she directed my attention to be at the ataman in the u-shaped configuration surrounded. She said she placed an “ataman with a hard quartz top there for students to use as a table for their laptops or as a foot-rest” (see Photograph 2). She then pointed to the blue couch at the end of the u-shaped configuration. She said these couches had been slipcovered in a moisture resistant fabric incase students spilled the liquid would stay on the surface and not penetrate the couching. We then walked back toward the tables used for group study (see
 Photograph 3). She said that all the wood she uses in her projects is real and has been sanded and repurposed by the carpenters. She told me the chairs she had originally chosen for the space had not withstood the students’ use and had broken (see Photograph 4). She pointed to the three chairs that were left and showed me where they normally broke. She turned the chair over and showed how even though it was a strong x brace the legs bent when students rocked back in the chairs. She also said that when they fell back in the chairs the back of the wood would crack and she would be forced to remove the chair from the space. She then pointed to the old chairs that she tried to replace and said that these metal chairs are the most durable for student use. They have two continuous metal legs that are shaped with a curve to support rocking and the metal backing can withstand all the students’ habits. She then walked me over to the solid primary colored chairs in front of the TV (see Photograph 5). She said these chairs could be ordered, the same as the multicolored square and black circle chairs, in parts. These are different because they are “ergonomically designed for reclining.” They can have a table surface that attaches but she didn’t order them in hope that students
could use their laps. She said that all the chairs in the room have wheels and afford “easy movement”. She did this not only for the students to be able to define their own space but to make it easier for the janitorial staff to return the room to its formal arrangement. She told me that the final piece of furniture in the space were the custom benches the carpenter designed (see Photograph 6). She stressed that study spaces need places for students to plug-in electronics so each booth style bench has an outlet (see Photograph 7). She then pointed to the carpet and said that she chose the carpet because it is tiled-carpet and can be replaced easily if something spills on it. She told me she chooses the tiles because they are cheap to replace; they are stuck down with “Velcro instead of glue and students laid them.” She told me her main concerns when designing a space are that it is “green, little to landfills as possible, movability, and durability.” We then left the room and headed downstairs to the renovated Dish Room (Fieldnotes 9-12).

5.3 Participatory Observation

Purpose: Participatory Observation is an ethnographic method that allows the designer to actively engage in the activity of studying in the locations that students use to study individually, in small groups and when using technology.
Participatory Observation can be used as a checks and balance. By using in, the designer is able to see if students are behaving the way they said they behaved in the Interviews (see section 5.1 Questionnaire and Interviews).

**Procedure:** Participatory Observation for this project was conducted in The Studio. The Studio is a dining facility combined with The Pulse, a coffee and smoothie bar. Participatory Observation was also conducted before and after interviewing students. During observation, I would watch and observe students movements in the space, who they were talking to and what they were doing while they studied.

**Results:** Students were observed studying on three different occasions in The Studio. The Participatory Observations were documented into fieldnotes (see Fieldnotes for complete version).

Participatory Observation Sample:

**Day 1 at The Studio**

5:25pm-5:35pm

The Studio is composed of three areas: The Pulse (café/coffee house), cafeteria lines, and the dining area. The dining area is generally what the students call The Studio. On this particular day it smelled like peanut butter. You could hear the sound of the door opening and shutting as well as the sounds of the blender coming from students ordering smoothies at The Pulse. You heard the guy over the speaker calling out Ace of Hearts, Queen of Spades with ever order. You also could listen to the A&E documentary that
was playing on one of the three TVs. The color palate of the space is brown, terracotta, grey and mustard yellow. The tables are vinyl. There are booths to the left that are 6 inches higher than ground level and go from small (seating four) to progressively larger (the last table seating ten). Then dividing the room in to halves hotdog style is a long booth bench with four rectangular tables and metal seats. This divider is mirrored on each side. The right side overlooks a single TV placed on the middle of the wall. The left side has two TVs that are placed in the corners of each wall. There are two tables on the mustard yellow wall that seat two people each. This wall curves opening into the space. When you first walk in the door you see a Red Box and the entrance to The Pulse. As you follow the curve you pass by the 6 trashcans and then you see the booths and division seating. Beyond the booths are three tables arranged into three quadrants of a square. Further past this point is the bathroom and then to the right of these tables is the lines into the cafeteria area. There are many fake plants under the windows. The wall to the right of the mustard curve is composed of windows that overlook a patio. The wall on the left of the booths is covered in Napkin Art. Each table has an outlet. There is fluorescent lighting as well as yellow ascent lighting above each booth. The other walls are grey. There are also structural columns throughout the space.

During the time of my observation there were 21 students who went to get food and left and three students occupied the interior space studying:
• Student 1: This was a brunette guy wearing a black polo and khaki shorts. In the five minutes he was there he has prepared himself a peanut butter sandwich and ate. He carried with him a crash study sheet of paper. He was there grabbing a bite to eat and studying last minute thoughts before leaving to take a test. As he was throwing away his trash he ran into a friend of his who wished him luck. His friend was heading to the cafeteria line.

• Student 2: This was a blonde guy wearing a white shirt, basketball shorts, and Vans. He was drinking a Blue PowerAde Zero. His backpack was on the floor and he was writing with a pencil. He had a few nervous habits, he kept itching his face, taping his pencil, pulling on his shorts and mouthing his notes. He also had a friend who walked by to get food. His friends said, “Stop Studying!” He said, “I have to I am on Academic Probation from not studying and I have a Biology Test in 10 minutes.”

• Student 3: She is a brunette and was wearing long pink shell earrings. She carried her phone, iPod, Pizza, water and a coke with her. She was eating while surfing the web and preparing herself to study. She ate most of her food and was getting ready to throw away her trash and hit the books when I asked if I could interview her. See Jenifer Interview (Fieldnotes 20-22).

Accurate Participatory Observation was not able to be completed in the Libraries on campus or in the Cafes off campus due to the lack of knowledge about the individuals studying. To have a accurate body of participants observed, all students studying need to live in the dorms on campus.
5.4 Personas

**Purpose:** “Personas use storytelling to engage social and emotional aspects of our brains, which helps each team member [of the design team] either visualize the best product behavior or see why the recommended design is good” (Goodwin, 2009:229). Personas are archetypes that describe different types of students, their goals and observed patterns of behavior. Personas are based on a compilation of the students that were interviewed. Similar qualities between subjects were clustered together to form each Persona type.

**Procedure:** Personas were generated by distinguishing similar goals, behaviors, likes and dislikes among the students interviewed. The Personas include a picture representation of the student, a name, a set of defined goals, a brief narration of the users mental model, skills, environment, frustrations, and attitudes during both individual and group study. These Personas also include Activity Theory Models (**see section 5.5 Activity Theory Models**) that helps to define the users behavior more. Both the Personas and the Activity Theory Models influence the behavior modes of the Need Cluster Model **(see section 5.6 Need Clusters Model)**.

**Results:** From the interviews, five Personas were created to represent the population of students who live on campus. Personas include: Quiet Thinker, Help Seeker, Space Hog, Frequent Breaker, and Timed-Out Procrastinator **(see

23
Presentation for all five Personas). Here is an example of the Quiet Thinker Persona developed:

Meet Ashley Anderson. She is a Freshman Psychology Major who lives in Ellsworth Hall. She is currently enrolled in 12 hours of reading intensive courses.

She has a difficult time reading in loud busy areas. However she has a roommate who always has company over and is not able to study in her dorm room. So she is forced to find a quiet study area else ware.

When she studies individually she only brings the necessary materials. She often leaves her computer at home because she doesn’t need it to accomplish her work. She cannot study to loud noises including music. She needs dead silence. She also has a difficult time studying when other people are talking or are on their phone. She likes to sit in the corner of the room away from distraction and movement and read her PSYC 102 textbooks.

When studying in her lab group for Zoology she prefers to meet only when necessary. She likes to Skype to accomplish all other work. She doesn’t really like to work in groups. She prefers to divide the work up and work
individual so the meetings go faster. When she meets with a group she wants to stay on task.

Goals:

- Accomplish Focused and Goal-Oriented Work
- Work Distraction Free
- Work in Dead Silence
- Be Secluded away from Public

5.5 Activity Theory Models

Purpose: Activity Theory Models can be used to define activities and mediating relationships. Engesröm’s Analysis Model is a “heuristic aid for identifying and exploring the multiple contextual factors that shape or mediating any goal-directed, tool-mediated human activity” (Gay & Hembrooke, 2004:2). Using this model allows for the Instruments, the Subject, the Object, the Rules, the Community, and the Divisions of Labor to be defined when analyzing how the Personas engage in the activity of studying.

Procedure: The five Personas and Interviews were combined and broken down according to the different sections of the model: Instruments, Subjects, Objects, Rules, Community, and Divisions of Labor. Then, they were analyzed to form the best possible Outcomes when studying.
Results: Each of the five Personas is accompanied by an Activity Theory Model which represents the breakdown of how the students study and the relationships between the tools they use, the people they encounter, and the goals they have when they study. Activity Theory Models include: Quiet Thinker’s Activity Theory Model, Help Seeker’s Activity Theory Model, Space Hog Activity Theory Model, Frequent Breaker’s Activity Theory Model, and Timed-Out Procrastinator’s Activity Theory Model (see Presentation for all Activity Theory Models). Here is an example of the Quiet Thinker’s Activity Model:

![Quiet Thinker's Activity Model](image-url)

Thinker's Activity Theory Model adapted from Engeström's Analysis of Activity and Mediating Relationships (Gay & Hembrooke, 2004:3)
5.6 Need Clusters Model

**Purpose:** Need Clusters is a strategy that “looks to create intersection between customer requirement (what they want/ need) and customer behavioral modes (how they go about getting what they want/ need)” (Alexis, 2006:1). By clustering the requirements and the modes, designers can generate solutions that impact a large user base and satisfy multiple needs.

**Procedure:** First information must be collected. Then it must be analyzed into behavior modes (how students study) and requirements (what students need to study). Once these are defined it is time to cluster similar qualities. These clusters are then named and analyzed further to develop possible design solutions.

**Results:** Information collected about the users in the Interviews (see section 5.1 Questionnaires and Interviews) was used to develop the five Personas (see section 5.4 Personas). The Personas were then summarized further into the Five Behavior Modes:

<table>
<thead>
<tr>
<th>Mode:</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiet Thinker:</td>
<td>These students like to study without distractions and are focused on accomplishing set goals.</td>
</tr>
<tr>
<td>Help Seeker:</td>
<td>These students seek help from outside resources such as specialist and Internet Question Generators. They need to be told what areas they need to focus on so they learn the necessary material to succeed.</td>
</tr>
<tr>
<td>Space Hog:</td>
<td>These students require large work areas with multiple surfaces. They study best when they can see and have access to all the materials they need.</td>
</tr>
<tr>
<td>Frequent Breaker:</td>
<td>These students are the ones you study for short period of time then take a break. To learn the material they often have to direct their attention at a single task and once completed they reward themselves with something off topic.</td>
</tr>
<tr>
<td>Timed-Out Procrastinator:</td>
<td>These students have waited to the last minute to begin studying and need to focus on learning mass amounts of information fast.</td>
</tr>
</tbody>
</table>

Need Cluster's Behavior Modes adapted from Alexis's Need Cluster Model (Alexis, 2006)
These modes describe the five different types of study habits students who live in the dorm exhibited. Students would not always occupy the same mode, they could switch between modes depending on what material they were studying or they could switch between modes depending on the number of people they were studying with. The next thing generated were the Seven Requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy Traffic:</td>
<td>The student is able to situate themselves amongst the crossfire of other students studying.</td>
</tr>
<tr>
<td>Brain Food:</td>
<td>The student is supplied food and beverages to power the brain.</td>
</tr>
<tr>
<td>Free Range:</td>
<td>The student is presented with as much freedom and space as they need to make their work flourish.</td>
</tr>
<tr>
<td>Tech Savvy:</td>
<td>The student is equipped with the necessary power, WiFi, and technological resources to support all work tasks.</td>
</tr>
<tr>
<td>Tailored Fittings:</td>
<td>The student is able to control their space and furnishings.</td>
</tr>
<tr>
<td>Remote Sector:</td>
<td>The student is able to be in public but feel like they are on a remote island, completely blocked from the congestion of others studying and noise that they may bring.</td>
</tr>
<tr>
<td>Genius Clique:</td>
<td>The student is given an area to talk with friends and colleagues about material being learned. In this area there are also people who can answer any question the student may have.</td>
</tr>
</tbody>
</table>

Need Cluster’s Requirements adapted from Alexis’s Need Cluster Model (Alexis, 2006)

These requirements represent the seven most dominant needs students had when studying. The final matrix created was the Need Clusters:
This model grouped the Modes and Requirements to form the six Need Clusters: User Control Settings, Secret Hideouts, Resource Hot Spots, Fun Zones, Productive Pockets, and Healthy Eateries. These Clusters are described further in the Architecture Affinity Diagram (see section 6.1).

### 5.7 Alpha-Beta Method

**Purpose:** Alpha-Beta Method is an algorithm used to mathematically differentiate and rate products.
**Procedure:** First determine what to Object to analyze. Then, define the Objectives by Rationales. Next, determine the Alpha Values of the objectives by determining the level of importance placed on that Objective. Then assign Beta Values for each objective by determining the level of “desirability, preference, suitability, and fitness” (Tiritoglu &Branham, 1997:4) of that Objective according to the Object. Finally, calculate the Alpha-Beta Values.

**Results:** Two Alpha-Beta Methods were used in this project. The first was used to determine if the five existing spaces used by students to study met the needs of a “third place” according to Oldenburg’s 8 Characteristics of “Third Place” *(see Presentation for Characteristics of Third Place Alpha-Beta Method Charts).* The second Alpha-Beta Method, exhibited below, was used to see if the five existing spaces used for study met the requirements determined by the Requirement Mode of the Need Clusters *(see section 5.6 Need Clusters Model).* The first chart describes the rationale of each of the seven objectives in this case being the requirements. The second chart shows the calculations of each of the spaces against the objectives. Alpha Values were determined by the importance of the objective according to information obtained during the interviews *(see section 5.1 Questionnaires and Interviews).* The Beta Values were determined by using the Rationale list as a checklist. If the space met all the Rationales of an Objective that space received a point values of 100 percent. Then the Alpha and Beta Values were multiplied together and
added to get the total Alpha-Beta Value for that space. This number enables the spaces to be compared in a nonbiased way.

<table>
<thead>
<tr>
<th>Study Space Requirements Alpha-Beta Method:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective:</strong></td>
</tr>
</tbody>
</table>
| 1. Heavy Traffic | • Public  
• Move Throughout Space  
• Be able to Sit in the Crossfire of Traffic  
• Access to Multiple Spaces  
• Located near Alternative Activities |
| 2. Brain Food | • Healthy Treat Options  
• Fresh Food Options  
• Snacky Food Options  
• Grab and Go  
• Energy Food: Caffeine |
| 3. Free Range | • Come and Go as Pleased  
• Work For Short Periods of Time  
• Linger  
• Be Able to Move About Space  
• Clean Work Surfaces  
• Informal  
• Be Able to Spread Out  
• Open  
• Flexible  
• Option to Eat in Space  
• Conversation Level: Indoor Voices |
| 4. Tech Savvy | • Electricity  
• Printing Services  
• WiFi  
• Computers  
• Printers |
| 5. Tailored Fittings | • Choices in Furniture Options  
• Comfortable Furniture  
• Mobile Furniture  
• Custom Internet Controls: Allotted Facebook, Youtube, Surfing Time  
• Adjustable Light  
• Adjustable Volume |
| 6. Remote Sector | • Obnoxious Free  
• Distraction Free  
• Noise Free  
• Secluded  
• Space Between People  
• No Cell Phones: No Texting  
• No Eating |
| 7. Genius Clique | • Knowledgeable Company  
• Access to Specialist  
• Access to Help Services  
• Be Able to Get Questions Answered  
• Access to Students Working on Similar Topics |

Study Space Requirements Alpha-Beta Method adapted from Alpha-Beta Method (Tiritoglu & Branham, 1997)
6. Conclusion

6.1 Architecture Affinity Diagram

Purpose: Architecture Affinity Diagrams can be used “to organize ideas and strategic directives” (Alexis, 2006:8). This can then be used to generate conceptual solutions to a problem. These solutions can be both long-term and short-term implementations. Then once the designer has a Framework, each conceptual solution can be evaluated.

Procedure: Once the Need Clusters (see section 5.6 Need Cluster Model) are complete, the clusters can be organized by how they facilitate the experience. Then once these are defined, they can be broken down by

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Study Requirements Alpha-Beta Method adapted from Alpha-Beta Method (Tiritoglu & Branham, 1997)
what goal the clusters must meet to satisfy such interaction. Then, the final group will be the conceptual solutions generated by thinking about how these goals can be achieved.

Results:

This model breaks down into two ways the experience can be facilitated: customizing the experience, which makes the experience unique to the user, and facilitating the experience, which defines the different spaces available for use. This is taken one step further by incorporating the Need Clusters defined earlier in section 5.6 Need Clusters Model, this diagram shows that in order to satisfy the experience being facilitated the Need Cluster must be present and it can be achieved by reaching the goals which pertain to that Cluster. It then goes on to say possible ways the goals can be reached. For example the first branch of the Architecture Affinity Diagram:
In order to customize the experience there must be user control settings. These settings must be achieved before arrival, during experience and after engagement. In order to facilitate the before the arrival customization, the student must meet the goal of being able to control the environment. This can be achieved by checking-in, setting up their study mode, ordering food, and networking. Students can check-in online by making request for food and/or supplies, by setting up environmental settings such as temperature, by reserving a location, by working with the student’s schedule to coordinate services and by giving the user parental internet control. Students can set up their study mode before arrival by defining their study preferences (such as a couch, a window and a Large Mocha) and making it customizable to each students order. Ordering food can be done before hand online. Networking can be achieved by connecting classmates so they can answer each other’s questions and by suggesting environments that will satisfy multiple group members needs. (Refer to Presentation for complete Model, Pink- How Experience is Facilitated / The Need Clusters, Orange- Goals, Blue- Conceptual Solutions)

6.2 Concept Map

Purpose: A Concept Map allows designers to make sense of ideas, objects, and activities by defining them in terms that they already understand so that new meaning can be created. Concept Maps normally answer what is this idea,
concept or activity and how does it relate to other ideas, concepts, and activities.

**Procedure:** A Concept Map starts by asking a focused concept, in this case one of the Need Clusters (see section 5.6 Need Clusters Model) and then breaking it down into more general concepts, in this case the most basic solution that could be implemented to accomplish such Need. Concepts are usually nouns and are linked to one another by verbs. As Concept Maps evolve, relationships between concepts emerge. These relationships are what provide the designer with new insights.

**Results:**

sp[A.C.E.] Concept Map (see Presentation for Larger Scale)
This Concept Map shows the relationships between the different Need Clusters and defines what each of those Clusters looks like. It also gives way to possible solutions that could be implemented to satisfy each Cluster. For example the Fun Zone Branch of the Concept Map:

Facilitating the Experience by offering space to break and to work. These break spaces are Fun Zones and Healthy Eateries. Fun Zones offer security and an area (physical space). Security allows one to leave stuff unattended and be guaranteed a location. Security is accomplished by the space providing Lockers and Floor Monitors. Lockers allow for storage of stuff and distinguish between unoccupied space and occupied space. These Lockers can be separate from the desk or the desk can convert into a Locker. Floor Monitors can be People and/or Cameras. Fun Zones also offer an Area (physical space) for relaxing, eating in the Healthy Eateries, smoking, talking in person and/or on the phone, power napping, and sitting. Fun Zones can be accomplished by providing a Break Lounge with Furniture and a Smoke Area. The Smoke Area is for smoking. The Furniture is used for Power Naps, Talking, and Sitting. *(Refer to Presentation for Complete Map, Pink- Need Cluster, Blue- Possible Solutions, Green- What and How Implemented)*

**6.3 Solution**

After completing the Architecture Affinity Diagram and the Conceptual Map, two overall themes emerged: customization of a physical space and an application to facilitate and reserve such a space. Together these themes make up the service:
sp[A.C.E.]. sp[A.C.E.] is both an application and a physical space that allows users to reserve the perfect study environment before studying, to modify the study environments they are currently using, and to save environmental conditions so a study session can be repeated for future use.

6.4 Real World Application

sp[A.C.E.] could be a Google Application that would allow students to reserve and customize their study space. Students would be able to log in and make the ideal environment they wish to study in. The reason it could be a branch of Google is because students are currently using their Gmail accounts to exchange email, Google Docs to share collaborative files, and Google Groups to manage class groups. Google + could then be utilized to locate other students studying the same subjects so if or when a student need to seek help they can locate the other students. The environment could be prototyped and tested using elements of the space prototyping kits Make Space designed. If these spaces are in high demand then Campus’ Dining Facilities could transform at night into study areas.

6.5 Next Step

The next step in this project is to prototype the application and the space. Using Task Analysis to influence the Persona Based Scenarios and then Testing both the application and space will help to influence the design and appearance of sp[A.C.E.] the service.
6.6 Further Development

Once the prototyping of the application and space are complete, analyzing undergraduate students who live off campus, graduate students who live on campus, and graduate students who live off campus can be done to further development the appropriate application and space to facilitate the best study environment for all students to use as a “third place,” study space.

7. Glossary

**Academic Collaboration Environments**- Environments: Academic Collaboration Environments support the collaboration and study habits between members of the academic community on both an individual and cooperative level.

**Participatory Design**- Participatory design approaches the design process by involving stakeholders (e.g. users, suppliers, sellers, producers) in the creation of a design to ensure that it is usable and fits their needs.

**Place-making**- Place-making refers to how people define space. It accounts for what items those people bring into a space and allows people to take temporary ownership of a space.

**Space vs Place**- Space is created by architects. Place is created by the people using the space.

**Third Place**- The third place is a space outside of the home and work environment that supports community interaction.
8. Bibliography


Harrison, S., & Dourish, P. (1996). Re-place-ing space: The roles of place and space in collaborative systems. *Computer Supported Cooperative Work*, 67-75. doi:


9. References


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