LANDSCAPE DESIGN CRITERIA FOR CREATING A RESTORATIVE ENVIRONMENT IN OUTDOOR AREAS OF IKENBERRY COMMONS RESIDENCE HALLS

BY

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THESIS

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ABSTRACT

On a daily basis, university students face significant challenges in sustaining their capacity to pay attention. Students are involved in numerous activities throughout the day that require them to draw on their attentional capacity – a capacity that often fatigues before the students have completed their work for the day. Past research demonstrates that taking breaks in restorative environments allows students to restore their capacity to pay attention and thus recover from mental fatigue. Attention Restoration Theory (ART) posits that exposure to nature, whether physical or visual, is restorative. However, research on the specific elements of the physical environment and design that promote restoration is insufficient. This thesis focuses on understanding those elements and generating landscape design criteria, using one of the four restorative components proposed by ART—being away. We wanted to see which landscape components students rated as creating a sense of being away in a restorative outdoor space. The site chosen for this investigation is Ikenberry Commons Residence Halls on the campus of the University of Illinois, Urbana Champaign. First, we evaluated the existing conditions of the space and how students were using it, through observations, surveys, and interviews. Next, we distributed photo surveys of different design elements around campus and asked students to rate the perceived restorativeness of these spaces. Based on these results, we developed three designs for the space and held a focus group discussion with dormitory residents to discover students’ opinions about these designs and whether they created a sense of “being away.” The results revealed that aesthetically pleasing bodies of water, artwork, and enhanced tree cover are the main landscape elements that effectively stimulate a sense of being away. The findings suggest that these landscape elements foster restoration and universities should provide them in dormitory complexes and other settings where students seek restorative experiences.
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CHAPTER 1: INTRODUCTION

People experience mental fatigue when they engage in extended periods of mental work and effort. In such a state, accomplishing tasks is difficult because it is hard to focus one’s attention. To make every effort to pay attention in a difficult environment is central to what is experienced as mental fatigue (Kaplan & Kaplan, 1989, 182). The common symptoms of mental fatigue include an inability to concentrate, memory lapses, trouble with learning, reasoning and judgment problems and less tolerance (Kaplan, S. 1992). It is one of the most common problems affecting people in society today, and is especially prevalent among university students. Students are very often under pressure to perform well in academics as well as in extracurricular activities, leaving them mentally exhausted by the end of the day and longing for a break.

When mental fatigue is the result of an overworked capacity for sustained attention, then recovery can be achieved by giving a break to this capacity (Kaplan & Kaplan, 1989, 182). A number of psychologists have demonstrated that spending time or taking breaks in restorative environments allow students to recover from mental fatigue and return to their work cognitively refreshed. Restorative experiences can occur in natural environments because they are rich in the characteristics necessary for attention restoration (Kaplan, 1995) and require nominal mental effort.

In recent decades, significant research has been done on restorative environments and their psychological and public health benefits. Restorative environments allow people to take a break from a demanding environment. The conventional understanding of taking a break is to get away from your current situation and location to have restorative experience. Many people find, for example, that it is rejuvenating to have a weekend retreat in an exotic place after a long challenging week. Others find it restorative to simply go hiking in a nearby natural area. However, recent studies have found that it is not required to travel to faraway places to have a restorative experience.
experience. Nearby urban green spaces, though often limited in cities, have a positive influence on mental restoration (Peschardt & Stigsdotter, 2013; Kaplan, 2001; Tennessen & Cimprich, 1995) and are likely to become more influential as settings for restoration (Nordh et al., 2009). For example it is refreshing to take a walk in a park after a long, mentally-fatiguing meeting. A restorative setting can also be large or small.

Unfortunately, there is inadequate research available on the particulars regarding the specific elements of the physical environment that aid restoration and how to design an effective restorative environment. The objective of this thesis is to identify those specific landscape elements and to understand the extent to which it is possible to design an effective restorative environment be it small or big, in this case - in the outdoor areas of Ikenberry Commons. I use one of the four restorative components proposed by Attention Restoration Theory—a sense of being away—as a criteria for restorativeness.

1.1 TOPICAL BACKGROUND

To understand how restorative environments can help individuals recover from mental fatigue, I first turn to Attention Restoration Theory (ART) (Kaplan & Kaplan, 1989, Kaplan, 1995). According to ART, natural settings can aid in the restoration of a reduced capacity to direct attention (Nordh, et al., 2009).

1.1a Attention Restoration Theory

According to ART there are two kinds of attention - involuntary attention and voluntary or directed attention. Involuntary attention is evoked or captured by sudden stimuli or something exciting or mesmerizing in an environment. This involuntary attention requires no effort. Examples include bird watching, staring into a fire, or sitting by a fountain. On the contrary, directed attention requires one to focus attention on something in an environment which may not be interesting, and
to engage in higher mental processes. It requires effort, and one's capacity to put forth that effort is finite and susceptible to mental fatigue (Kaplan & Kaplan, 1989, Kaplan, 1995). Examples include listening to a lecture, studying for an exam, or practicing an instrument.

In their book *The experience of nature: A psychological perspective*, Rachel Kaplan and Stephen Kaplan theorize that mental fatigue occurs when one’s capacity for directed attention fatigues. Attention restoration theory (ART) presents an analysis of the different environments that improve people’s directed-attention capacity. ART also prescribes conditions or settings that promote recovery from mental fatigue. These restorative settings have four properties: *being away, extent, fascination, and compatibility* (Kaplan, 1989; Herzog, et al., 2003).

*Being away* involves dissociating oneself from regular activities that lead to directed attention fatigue. People usually associate the terms “get away” and “escape” with these kinds of settings. *Being away* can be psychological where mundane thoughts are absent, or it can be physical, such as taking a walk in the courtyard during lunch time or going on a vacation. It does not require a change in position to be effective, but it does require a change in mental content - away from the things that were causing directed attention fatigue to something different in order to give directed attention capability a rest. Herzog et al. (2003) describes it as “getting away from it all,” and claims that this is the underlying characteristic that makes a setting restorative.

The second characteristic of a restorative setting is *extent*. *Extent* exists in an environment that is sufficiently rich in content and is coherent enough to be perceived as a ‘“whole other world’’ (Kaplan & Kaplan, 1989, 173). It should provide enough to see, experience, explore and think about to fully engage the mind involuntarily and give directed attention a rest. Examples of settings with “extent” include a Japanese gardens or a wilderness. The third characteristic is *soft fascination*. Settings that are fascinating draw on involuntary attention and consist mainly of fascinating elements. These elements occur in a variety of settings and situations that people find
interesting and varies in intensity. It does not require effort or inhibition of competing stimuli. While one is involuntarily fascinated by the elements, one’s fatigued directed attention capacity gets to rest and becomes restored. The final characteristic of a restorative setting is *compatibility*. 

*Compatibility* occurs when the setting fits what the individual is trying to achieve; the setting should correspond to individuals’ purposes or inclinations. These purposes must be consistent with the demands made by the setting (Herzog, et al., 2003). Thus, settings are complex because they can be compatible for certain individuals and incompatible for others, and the levels or intensities can be different as well.

An extensive body of research has found that natural settings are effective in restoring directed attention. Research indicates that participants who visited a natural environment performed better in directed attention tasks compared to other participants who were deprived of the experience in a natural environment (e.g. Hartig, Mang & Evans, 1991). Some studies on the restorative effect of natural environments indicated that views of nature through a window (Ulrich et al., 1991; Kaplan, 1993, 2001; Tennessen & Cimprich, 1995) and viewing simulated nature in videos, slides or paintings (Berto 2005) also aid in restoring attention.

Unfortunately, many people in developed countries no longer have regular access to nature (Kaplan & Kaplan, 1989, 189); it is challenging to locate and spend time in restorative environments. Fortunately, even small green spaces may have substantial restorative value (Kaplan, Kaplan, & Ryan, 1998). Research indicates that a small intimate park close to home is often a highly valued green area (Burgess, Harrison & Limb, 1988). If the park is at a convenient distance to one’s residence, it will be visited more often (Grahn and Stigsdotter 2003 and Nielsen and Hansen 2006). It is very important to design urban green spaces with an intention to create restorative environments that promote attention restoration. Thus, this study focuses on generating landscape design criteria, using one of the four restorative components proposed by Attention
Restoration Theory—*being away* as an underlying determinant for creating attentionally restorative outdoor spaces.

1.2 RESEARCH QUESTIONS

Scholars have established that directed attention plays a crucial role in human functioning. Directed attentional fatigue can be minimized by spending time in restorative environments. There is, however, a gap in knowledge about the design content and landscape components required for a restorative environment. It is important for us to know how to design a successful restorative environment. Numerous landscape components can contribute to a restorative environment which gives a feeling of *being away*. It is my hypothesis that a combination of vegetation (its proportion, types and layout), water elements, and hardscaping materials creates a restorative landscape design. The purpose of this study is to investigate which design components people perceive as more restorative. Based on my results, I hope to present a landscape design criteria for creating effective restorative environments. A restorative setting is particularly important in a campus setting, which is the context of my research, because university students need effective attention restoration breaks so that they can return to their work cognitively refreshed.

My research interest is to better understand the landscape elements that promote a sense of *being away*. I will do this within the context of a landscaping problem on the University of Illinois campus. The Ikenberry Commons is in need of better landscaping because the current landscape design lacks interesting elements and is uninviting in its appearance for students seeking a restorative environment during breaks. I want to find what people currently think of the landscape and whether it promotes a sense of *being away* and then offer design suggestions to improve the landscaping. In particular, my goal is to offer suggestions that will increase the landscape’s ability
to provide a refuge for students where they can have the sense of *being away* from their regular academic experience so that they can recover from mental fatigue.

To reach the goal, I ask the following questions:

1. What are the current characteristics of Ikenberry Commons? How is it currently used?
2. What do students think of the existing Ikenberry Commons landscaping? How do they use the space?
3. Which landscape elements promote a sense of *being away*?
4. How can the current Ikenberry Commons be modified to increase the sense of *being away*?
CHAPTER 2: METHODS

In order to examine these questions, I first observed the Ikenberry Commons to see what it contained and how it was being used. Next, I interviewed students and gave students a questionnaire about how they were using Ikenberry Commons, what they thought of the landscape elements, and how they helped promote a sense of being away. After evaluating the current conditions of the Ikenberry Commons and how it was used, I developed a photo-questionnaire to examine what people thought of other landscape design elements around campus and how these elements promoted a sense of being away. Finally, I created three designs and conducted a focus group discussion to see what students thought of these designs. A final questionnaire was distributed to the 6 focus group students residing in the Ikenberry Commons asking them to evaluate the designs proposed. Below, I provide a description of each of the methods in this study.

2.1 STUDY AREA

The study was conducted in Ikenberry Commons, a group of residence halls and a dining hall at the University of Illinois at Urban-Champaign. Ikenberry Commons consists of 14 acres, bordered by Gregory Drive to the north, Euclid Street to the east, Peabody Drive to the south and First Street to the west. Ikenberry Commons is surrounded by University Housing on the north, the Activities and Recreational Center and Memorial Stadium on the south, recreational fields on the west and campus buildings on the east. It is located in the south west portion of the campus.

The residence halls were built between the 1950s and 1960s. These residence halls consist of Forbes, Garner, and Hopkins Residence Halls on the north of the site and Scott, Snyder, and Weston Residence Halls on the south. University Housing plans to demolish and rebuild these residence halls, one building at a time over the coming decade. The Ikenberry Dining Hall, Nugent Hall and Bousfield Hall are already completed. (SEE APPENDIX A for the proposed master plan).
The landscaped area of the Ikenberry Commons is also renovated with new large turf, site furniture and sporadic native plants and trees, and is reasonably well maintained.

Figure 1. Site and its surroundings with respect to main quad
Figure 2. Site showing the existing four halls and the two newly constructed buildings

Figure 3. Panoramic View of the site from South

Figure 4. Panoramic View of the site from West
2.2 STUDY OF THE SITE AND ITS INHABITANTS

First, I needed to learn how students were using the Ikenberry Commons landscape, what they appreciated, and what they wanted to change about this place. Most importantly, I wanted to understand how the Ikenberry Commons create a sense of being away. To answer this question, I used observations, a survey and face to face interviews during my twelve visits to the Ikenberry Commons. The first four visits were mainly to become familiar with the place and to study the physical features and natural aspects of the place through method observation and behaviour recording. During the last eight visits, I created a behaviour map, conducted a survey and interviewed groups of students at the site.
Figure 6. Figure ground study showing the existing residence halls

Figure 7. Figure ground study showing the open green space
During my last eight visits to the park, I recorded people’s behaviour on the map by noting their movement from start to end point. The activities were observed at different times—(morning, afternoon, and evening) and on different days (weekdays and weekends). Of the last eight visits, two were in the morning (Wednesday 7 am and Sunday 9 am), three were in the afternoon (Monday 1 pm Thursday 4 pm and Saturday 3 pm), two were in the evening (Friday 5 pm, and Saturday 7 pm) and one was in the late evening (Sunday 9 pm). I spent an hour or an hour and a half at each visit.

For the last visits, I set a timer for every 15 minutes and counted the number of students participating in various activities in various spaces.

2.3 CURRENT USE QUESTIONNAIRE

My primary aim was to understand how the landscaped areas contributed to the daily life of the students, to discover what elements students currently utilize and enjoy. The questionnaire
did not ask students for any personal information, including name or signature, and contained 20 questions in which 7 questions were open ended, and 14 questions were 5-point Likert-scale questions (not at all, a little, somewhat, quite a bit and very much) about the extent the residents used the outdoor areas and for what activities, the frequency of their usage, how much they appreciated the area, and how connected they felt with nature at the Ikenberry Commons. (SEE APPENDIX B for the complete questionnaire.)

2.3a PARTICIPANT SELECTION

Only the students residing in the Ikenberry Commons were allowed to participate in the survey. Questionnaires with 20 questions each were distributed to 20 students during lunch time and in study halls. Students took less than 10 minutes to complete the survey which was completely voluntary.

2.4 RESTORATIVE LANDSCAPES PHOTO QUESTIONNAIRE

After evaluating the current conditions of Ikenberry Commons and how it was being used, I sought to discover the landscapes elements elsewhere on campus that students perceived as restorative by distributing a photo questionnaire. The photo questionnaire consisted of 40 images of landscape settings located within the University of Illinois campus and was circulated to the undergraduate students residing in the Ikenberry Commons dormitory. The images chosen were a combination of outdoor spaces on campus that had low, intermediate or high use. The purpose of this study was to find out what kind of settings students find restorative and which settings they think help them recover the most and get back to work again refreshed. The objective was to find the relationship between the landscape components and their association with the perceived feeling of being away. We asked students to rate the extent the different landscape components
gave them the feeling of *being away*. We considered the landscape components such as the amount of vegetation, the color, texture, and pattern of vegetation, the proximity of the vegetation to their residence or work place, water elements and sculptures or other design elements. Images were carefully selected to isolate these different landscape elements. Some images highlighted water elements. Others highlighted plant texture or color. Some had a large amount of vegetation, while others had a small amount.

To respond to the visual survey, the students were first asked to provide minimal demographic data and then they were given the following scenario: Imagine you have been working very hard on a school project (e.g., you just finished a big paper or you stayed up most of the night studying). You know you cannot be productive again until you recover. Please look at the pictures below and rate how much you would be able to recover and get back to work again after spending time in each setting. The participants responded to each image by checking a 5-point Likert-type scale that included: not at all, a little, somewhat, quite a bit, and very much. (*SEE APPENDIX C* for the photo-questionnaire). The responses to the images were examined using factor analysis to distil the items into related categories.

2.4a PARTICIPANT SELECTION

Only the students residing in the Ikenberry Commons were allowed to participate in the survey. Photo-questionnaires, each containing 40 landscape images, were distributed to 100 students in the dining hall during lunch time and in study halls. Students took 20 minutes to complete the survey, which was completely voluntary.
2.5 DESIGNING A RESTORATIVE LANDSCAPE

Based on the results received from the previous two surveys, the next step was to redesign the Ikenberry commons landscape using the concept of being away and design a natural setting that is both restorative and functional. After a continued iterative design process, I proposed three design options. I prepared the master plans and three perspectives per design.

2.5a FOCUS GROUP PARTICIPANT SELECTION

A focus group was created to let the students evaluate the three proposed design options. Only the students residing in the Ikenberry Commons were allowed to be a part of the focus group. Emails and flyers were circulated among the residents of Ikenberry Commons, asking them to participate in the evaluation of the designs proposed. Of the 12 students who volunteered, 6 students were chosen to form the focus group. The discussion, which lasted an hour, was held in one of the conference rooms in Ikenberry Commons.

2.5b EVALUATION

Based on the results received from the previous two surveys, I assigned design priorities for the Ikenberry Commons landscape. I carried out an iterative design process, received feedback from my committee members, and established design priorities. I prepared master plans for three design options for the focus group to contemplate. Each design was shown from three different perspectives to give the students a better idea of the designs.

I also developed a questionnaire for the participants of the focus group, to elicit their opinions regarding the designs proposed. It consisted of 5 questions which addressed topics like how the students felt when they imagined themselves in each design (from the different perspectives). The participants were asked to evaluate each design by responding to 5 Likert-type
scale questions – not at all, a little, somewhat, quite a bit and very much (SEE APPENDIX D for the focus group questionnaire). Asking the students to respond to those images was one way to consider their opinions about design and development in creating a sense of being away in a dormitory complex.

First I showed them each design (master plans and three perspectives) individually, explaining the design concept and the functionality. Next I arranged the designs adjacent to each other and asked them to compare the designs. Students were instructed to consider the features of the three designs, including the views present, and to answer all questions for each design proposal. Images and the questions were presented on 8.5” x 11” paper. Students could look at each image as often as desired while responding to the questions.
CHAPTER 3: RESULTS

This thesis focuses on understanding the specific landscape elements of the physical environment that promote attention restoration and generating landscape design criteria for creating a sense of being away. Results are presented in four parts. First, I present the observation results to answer the question, what are the characteristics of the space? Second, I present results from the observations and current use questionnaire to answer the questions, what do students think of the existing Ikenberry Commons landscaping and how it creates a sense of being away? How do they currently use the space? Third, I present the results of the photo-questionnaire, which answers the question, how do landscape elements from elsewhere on campus promote a sense of being away? Finally, I present the three designs and the results from the focus group discussion and questionnaire to answer the question, “how can the current Ikenberry Commons be modified to increase the sense of being away?”

3.1 SITE CHARACTERISTICS AND USE

From my observation, the first thing I noticed was the vast open space in the centre of the site, surrounded by residence halls. Then I noticed the physical features: the turf, the site furnishings, the newly planted shrubs and trees, and how well the space was maintained. In my next three visits I familiarised myself with the existing residence halls and the new dining hall, noticing the differences between the new and old site furnishings, including seating, lamp posts, paving materials and vegetation. I also noticed the surroundings of the place, including other university housing on the same street and the bus stops near the place. The purpose of my observations was to study how the landscaped areas of the Ikenberry Commons contributed to the daily life of the dormitory residents. It was noticeable that the design aspect of the place was inward looking.
3.2 Current Use of Site

Next, I explored how students currently use the site. Based on my observational data, most of the people in Ikenberry Commons are students residing in the residence halls, staff working in Ikenberry Dining Hall, maintenance staff, students visiting their friends in Ikenberry Commons, families visiting their children in Ikenberry Commons and students who are passing through the site to get to classes or activities.

I have categorised the activities that occur in the site into three types – active, semi active and passive. Walking, biking, skateboarding, exercising and playing are classified as active. Activities like relaxing and viewing are classified as semi active and activities like cutting through or passing by and waiting for bus are classified as passive. The intensity of the activities varies during the weekdays and weekends and also varies at different times in the day. The activities occur at various spaces in the site. The site consists of pathways, turf, boulders for seating which are a part of the new construction, and plantings.

Figure 9. Activities analysis diagram
Figure 9 shows the different activities that take place in the central green space like viewing the landscape, playing (baseball, handball, softball, frisbee), relaxing (sitting on a bench, sitting on the grass, lying down on grass, reading a book, breathing fresh air), sleeping, and maintaining the place (watering the plants, mowing the lawn, trimming the plants). The diagram also shows the locations where these activities take place during a weekday. On the right hand side, the range of occurrence of these activities is depicted.

From the analysis diagram, undoubtedly the dominant activity was viewing the landscape while in the green space or from dormitory windows. The second dominant activity was playing on the new turf in the centre of the site. Activities such as relaxing and sleeping were not that prominent, but staff performed maintenance on the site on a regular basis.

Other activities such as walking, biking, skateboarding, jogging, passing through the site, and waiting for the bus took place on the pathways connecting the various halls. Undoubtedly the most dominant activity was walking. The Ikenberry Commons residence halls have only one dining hall which is located in the northeast part of the site. Students from the various residence halls have to walk to and from the dining hall for their meals. There is heavy pedestrian traffic from 8-9 am (breakfast), 12-2 pm (lunch) and 7-9 pm (dinner) on weekdays. On the weekend, less pedestrian traffic was observed. The second dominant activity was biking, and the third dominant activity was skateboarding. Activities such as passing through the site, jogging, and waiting for bus were less prevalent than the activities previously mentioned.

3.2a QUESTIONNAIRE

Results from the current use survey show how much the Ikenberry Commons is used and the nature of the activities that took place and also how the space influenced student’s behaviour in
the Ikenberry Commons. I also asked questions about how much they appreciated current conditions.

When I asked the students how frequently they used the outdoor area, majority of the students replied they used the outdoors on alternate days. Only a few used the space daily, and the majority of the students did not use the outdoor areas frequently. See figure 10.

![Figure 10. How frequently they used the outdoor area?](image)

I asked the students to what extent they use the outdoor area a) when they are alone and b) with others, and then created a histogram (Figure 11) of the responses given. We see that regardless of the case, outdoors is used by most students only "somewhat" and "not very much." We, however, see that when students are alone the response is mostly "not at all" as opposed to "a little" when they are with others. We also see that when students are alone, few students use it "quite a bit" and even fewer students respond with "not at all" when they are with others.
Next, I asked the students to what extent they used the existing components turf, pathways, rocks to sit, benches and the gardens in the Ikenberry Commons and which of the above components they liked the most? The response received was that the most used component was the pathways, but the most liked component was the turf. See figure 12.
Next, I asked the students how likely they were to do the following outdoor activities – exercising, relaxing, playing and passing through. The participants responded to this question by checking not at all, a little, somewhat, quite a bit, and very much. The vast majority of the students (75%) indicated that they were very likely or quite likely to use the area to pass through. Exactly half (50%) indicated that they were “somewhat” likely to use the space for exercise. Results for “relaxing” were more spread out between “not at all” and “quite a bit” with the average value of 3.0 on a 5-point scale. A bit more than one-third (35%) indicated that they were not likely to play in the space. See figure 13.
Next, I asked the students how much they appreciated the aesthetics, biodiversity, social interaction and the maintenance of the Ikenberry Commons. The participants responded to this question by checking a 5-point Likert-type scale that included: not at all, a little, somewhat, quite a bit, and very much. There were only a few “very much” ratings, except for how much they appreciated maintenance. Results for the other characteristics (aesthetics, biodiversity, social interaction) were more neutral. Aesthetics was rated higher than biodiversity. See figure 14.
Finally, I asked the students what elements can be included in the outdoor area that would draw them into the area. Half (50%) of the students indicated that they would like to see water elements, 30% indicated that they would like interesting artworks such as sculptures and 10% indicated they would like to see flowering plants. See figure 15.
3.3 PHOTO - QUESTIONNAIRE

Which landscape elements of an environment do students find most restorative? To answer this question, I chose images of outdoor spaces on campus that had low, intermediate or high use and asked the students to rate the extent the different landscape components gave them the feeling of being away. Based on the data collected, I used factor analysis, which is a statistical method, to enable me to investigate whether there is an underlying structure in the pattern of co relation between the 40 landscape images. Six categories were generated from the visual survey using factor analysis. The categories are arranged in descending order--water and art with a mean value of 3.0, turf and pathways with a mean value of 2.5, approach to buildings with a mean value of 1.9, arid lawn area with a mean value of 1.8, not very green with a mean value of 1.8 and courtyard spaces with a mean value of 1.5.

1. WATER AND ART with a mean value of 3.0.
2. TURF AND PATHWAYS with a mean value of 2.5.
3. APPROACH TO BUILDINGS with a mean value of 1.9.
4. ARID LAWN AREA with a mean value of 1.8.
5. **NOT VERY GREEN** with a mean value of 1.8.
6. COURTYARD SPACES with a mean value of 1.5.

3.4 DESIGN PHASE

Based on the results examined from the current-use questionnaire and photo-questionnaire it is evident that 1) Landscape elements like water bodies, artwork and tree canopy are viewed as restorative and would draw the students into this area if included. 2) The pathway is more significantly used even though the turf is most liked. 3) Even though the outdoor space is sufficiently large in area and closer to the dormitory, it is not frequently utilized for relaxing due to a lack of interesting or restorative elements (such as water features, greenery, or art work). Based on the findings, the following three design options were proposed. The comments and feedback received from the students of the focus group discussion are presented and evaluations for each proposal are analysed separately.
3.4a DESIGN PROPOSAL 1

This design is inspired from the existing main quad at the University of Illinois campus. The special feature of this design is the expansive turf with crisscross pathways making it easier to walk around the site and the mixed vegetation plantings of native grasses to add texture to the site. This design showcases a water body with seating around it located in the west, an interesting sculpture courtyard near the dining hall, tree-lined avenues with seating underneath the canopies and a row of trees on the periphery of the site which provides shade on the sidewalk for those walking through. These characteristics meet the restorative criteria of being away.
Figure 16. Masterplan
Figure 17. View from point A (north eastern side)

Figure 18. View from point B (south eastern side)
I asked the students in the focus group what they thought about the designs, in particular how restorative they felt they were. The focus group’s response to this design was neutral. The students overall rated this proposal as “somewhat” restorative. 4 out of 6 students rated that this design could only attract their attention and refresh their mind “somewhat”. In the discussion, the students said that they do not feel a sense of being away in this design and their response to the questionnaire also supported this. The histogram below shows us how the students responded to the Design Proposal 1 (SEE APPENDIX D for the focus group questionnaire). It was the least accepted design option for a restorative space that promoted the sense of being away. The students found the trees on the edge of the site, tree lined avenues, water body with seating around the periphery and seating under the tree canopies appealing. They felt the crisscross pathways helped cut across the site easily. They felt this option requires more sculptures, interesting and varied vegetation or colourful flowerbeds and enhanced tree cover to make them feel like they are being away from everyday thoughts and concerns.
The special feature of this design is the urban forest located in the middle of the site and
the organic pathway with different hardscaping materials. This design showcases an organic water
body with abundant tree cover located in the west, interesting sculpture, seating underneath the
tree canopies, mixed vegetation including prairie grasses and ornamental trees to add color, texture
and interest to the site, and a row of trees on the periphery of the site which provides shade on the
side walk. These characteristics meet the restorative criteria of being away.
Figure 21. Masterplan
Figure 22. View from point A (north eastern side)

Figure 23. View from point B (south eastern side)
I asked the students in the focus group what they thought about this design, in particular how restorative they felt it was. The focus group’s response to this design was positive. The students said that they do feel a sense of being away in this design and their response to the questionnaire also supported this. The histogram below shows us how the students responded to the Design Proposal 2 (SEE APPENDIX D for the focus group questionnaire). It was much more appreciated than Design Proposal 1. 4 out of 6 students rated this proposal as a place where they can relax and be at ease “quite a bit” as compared to the previous proposal. The students found the design in its entirety new, interesting and engaging. They liked the abundant tree cover across the site which created a forest-like feel, interesting vegetation with colourful flowerbeds, seating under the tree, and the trees on the edge of the site. They felt this option required more sculptures to attract their attention.
Figure 25. Focus group response to Design Proposal 2

3.4c DESIGN PROPOSAL – 3

The special feature of this design is the extensive water body that extends from the east to west unlike the previous designs. This design showcases an organic water body with seating around its periphery. Interesting sculptures surround the water, which are encompassed by vast expanse of native grasses adding colour, texture and interest to the site. There are benches on the sides of pathways to sit and relax and a row of trees on the periphery of the site which provides shade on the sidewalk. These characteristics meet the restorative criteria of *being away*. 
Figure 26. Masterplan
Figure 27. View from point A (north eastern side)

Figure 28. View from point B (south eastern side)
I asked the students in the focus group what they thought about this design, in particular how restorative they felt it was. The focus group’s response to this design was positive. The students said that they certainly do feel a sense of being away in this design and their response to the questionnaire also supported this. The histogram below shows us how the students responded to the Design Proposal 3 (SEE APPENDIX D for the focus group questionnaire). It was the most appreciated out of all three design proposals. The students found this design awe-inspiring and captivating. They liked the voluminous water body that stretches across the site, the interesting vegetation, the dozen sculptures and the trees on the edge of the site. They felt this option would be even better with more trees along the water body to make them feel like they are being away from everyday thoughts and concerns.
Figure 30. Focus group response to Design Proposal 3

- Attract my attention
- Refresh my mind
- Engage in activities that differ from my daily routine
- Away from everyday thoughts and concerns
- Relax and be at ease
CHAPTER 4: DISCUSSION

This study answers the research questions concerning the landscape design criteria for creating effective restorative environments, in particular with a concept of being away. This study examined the current characteristics of Ikenberry Commons and how is it currently used. The existing design of Ikenberry Commons is inward looking – the residence halls are located around a large open central space with minimal trees and vegetation and no water or sculpture features to engage students’ involuntary attention. The space is predominantly used for passing through the site and less for outdoor activities. Not very many students used the space for relaxation or exercise, which suggests that it may not be a very restorative space.

Unsurprisingly, students had neutral responses to the space. The students appreciated the maintenance of the Ikenberry Commons, but they felt that including elements such as water bodies, sculptures and planting flowerbeds would make the place interesting and in turn use the outdoor space better.

The next research question was which landscape elements promote a sense of being away. The results show that the most highly rated categories were water elements and artwork. Students rated turf and pathways as somewhat less restorative. As observed in University of Illinois campus, students spend a lot of time in the main quad which is a large open lawn space. But the ratings for settings with ample lawn space were somewhat lower than expected.

Using the results from the landscape elements questionnaire, I created three new designs of the Ikenberry Commons using landscape features students rated as “restorative” and asked students to discuss how much these landscapes created a sense of being away. The two designs that were rated as most restorative included a lot of water elements, artworks and tree cover. The design that consisted of a large amount of turf and no water elements or sculpture was rated as less restorative. These results support the landscape element questionnaire, showing that
landscape elements that can engage one’s involuntary attention (a water body, for instance) may be more restorative than large turf areas. If these elements can be included in the proposed master plan for the Board of Trustees of the University of Illinois, the outdoor areas of Ikenberry Commons would promote a sense of being away. These findings provide new information about the landscape elements that are considered compatible for restoration and make us rethink existing design norms.

4.1 CONTRIBUTIONS

This study contributes to our understanding of the impact of the built environment on our mental health. From my research it has been revealed that the students felt very much like being away from their daily routine in a setting with extensive waterbodies and sculptures in the outdoors. Another aspect which I discovered during the course of the research was that the addition of trees to any of the settings increased the perceived restorativeness of an environment. It broadens our past knowledge by suggesting that the addition of trees may help people recover from mental fatigue. Tree cover is an important component in a restorative environment. Previous research indicated that physical (Hartig, Mang & Evans, 1991) or visual access to nature (Ulrich et al., 1991; Kaplan, 1993, 2001; Tennessen & Cimprich, 1995; Berto 2005) with elements that capture an individual’s attention easily are important in supporting attentional functioning and ultimately helping people recover from mental fatigue. This study demonstrates that it is possible to design an outdoor area with the concept of being away and create a natural setting that is both restorative and functional. The insights provided by the results of this study can help campus administrators, planners, and landscape architects enhance the restorative features of the green spaces when planning or renovating campus outdoor areas.
Large turf areas are a staple of campus landscape designs. In my study, many students did indicate that they used these spaces for outdoor recreational activities with others. However, these spaces were rated as significantly less restorative than areas with dense tree cover, spaces with water bodies, and spaces with colorful flowers and sculptures. Campus designers should reconsider the amount of turf proposed when they design outdoor settings where students can have restorative experiences.

Also, university students should be made aware of the many mental and physical health benefits associated with being outdoors in nature. An outdoor area designed with a concept of being away can help the students have experiences with nature that can result in their improved mental and physical wellbeing, including but not limited to attention restoration.

4.2 LIMITATIONS

This study has certain limitations. First, the results of this study are limited by the nature of the sample—students between the ages of 18 and 23 who reside in the Ikenberry Commons area. Also the research data was collected without considering students’ gender, and the sample size for the focus group was very limited. In the landscape elements questionnaire, it was difficult to isolate specific landscape elements (such as pathways or vegetation) because these elements are often combined. Therefore, other elements may be influencing restorative ratings. Furthermore, the landscape designs were made to appear commendable and did not include a few undesirable qualities found in real settings. Additionally, the participants were asked to imagine themselves as mentally fatigued and in need of a restorative experience in nature. It is impossible to know how effectively they imagined themselves as mentally fatigued.
4.3 FUTURE RESEARCH

Future research on the perceived restorativeness of landscape components should accommodate a larger sample group and include individuals living in different settings. Researchers could also give participants exposure to a variety of real landscape settings and expose them to mentally fatiguing situations to more accurately measure their responses to restorative settings. Future research could also investigate whether landscape elements are still restorative over time. For instance, would a sculpture or a water element still be considered restorative after prolonged exposure?
CHAPTER 5: CONCLUSION

This study provides evidence about the perceived restorativeness of different landscape elements in a challenging setting—a dormitory complex on a major university campus, a place where students spend a huge portion of their time. Students indicated that landscape elements that stimulate a sense of being away are water bodies, artwork, and nature (tree cover and colorful flowerbeds). When students can view, touch or listen to the water, they sense a feeling of being away and want to take restoration breaks from academic work. Artwork or sculptures engage their mind effortlessly and draw them into the space. Tree cover and colourful flower beds make them feel like they are away from everyday thoughts and concerns. Results clearly show that water and art effectively foster restoration. These results are not surprising, as previous research has established that people find settings with extended water bodies (Kaplan, Kaplan, and Ryan 1998, 109), numerous sculptures and capacious tree cover (Kaplan, Kaplan, and Ryan 1998, 111) restorative. In compliance with attention restoration theory, these findings reinforce the need for integrating natural features and interesting elements in the outdoors, which attract attention effortlessly and refresh the mind, while arousing a feeling of being away.
REFERENCES


APPENDIX A
PROPOSED MASTER PLAN

Proposed Master Plan of Ikenberry Residential Complex - 2013
2968 beds (increase of 103 Beds)
APPENDIX B

QUESTIONNAIRE

1. Please circle your gender
   A. Male    B. Female    C. Prefer not to answer

2. Please choose your age group
   A. 18-22    B. 23-30    C. Older than 30

3. Are you an international student?
   A. Yes    B. No

4. If yes what is your native country? ___________________________________________

5. To what extent do you use the Ikenberry Commons (IC) outdoor area while you are alone?
   Not at all    A. little    Somewhat    Quite a bit    Very much
   □    □    □    □    □

6. To what extent do you use the IC outdoor area while you are with others?
   Not at all    A. little    Somewhat    Quite a bit    Very much
   □    □    □    □    □

7. How likely are you to do the following outdoor activities at IC?
   A. Exercising (jogging, running, walking, biking, skating)
      Not at all    A. little    Somewhat    Quite a bit    Very much
      □    □    □    □    □
   B. Relaxing (sitting on the bench, reading, breathing fresh air, watching)
      Not at all    A. little    Somewhat    Quite a bit    Very much
      □    □    □    □    □
   C. Playing (baseball, softball, handball, frisbee, etc.)
      Not at all    A. little    Somewhat    Quite a bit    Very much
      □    □    □    □    □
   D. Just walking to get to the other side
      Not at all    A. little    Somewhat    Quite a bit    Very much
      □    □    □    □    □
   E. Other’s please specify ___________________________________________________

8. If you don’t use the IC outdoor area can you tell us why? _________________________

9. How frequently do you use the IC outdoor area for activities?
   A. Daily    B. Alternate days    C. Once a week    D. Once a month    E. Never

10. Have you had any events or parties in the IC outdoor area?
    A. Yes    B. No

11. If yes, how many students would congregate for the event?
    A. 1 - 5    B. 6 - 20    C. 21 - 50    D. 51 - 100    E. 101 - 200

12. Which part of the IC landscape do you use more often?
    ____________________________________________

13. Which part or features of the IC landscape do you like the most? _________________________

14. Do you like the view of the IC landscaped area from your dormitory window?
    A. if yes, what do you like the most - ____________________________________________
    B. if no, what don’t you like - ____________________________________________

15. Do you like the view of the IC landscaped area from the dining hall windows?
    A. if yes, what do you like the most - ____________________________________________
B. if no, what don’t you like - __________________________________________________________

16. How connected do you feel with nature in IC?

   Not at all  A little  Somewhat  Quite a bit  Very much
   □      □      □      □      □

17. Do you go to other parks in your leisure time?  A. Yes  B. No

18. If so which park and why? _______________________________________________

19. What elements would draw you into the landscape at ICR?
   A. More greenery (trees, shrubs, flowering plants)
   B. Artwork (sculptures, abstract installations)
   C. Water elements (fountains, jets)
   D. More benches or movable seating
   E. Other’s please specify____________________________________________

20. As you read each statement below, please indicate your answer using the boxes on the right. When thinking about the landscape at IC, how much do you:

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A Little</th>
<th>Somewhat</th>
<th>Quite a bit</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>appreciate the look of the landscape</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>appreciate the look of the parking lots</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>appreciate the look of the interior Courtyard</td>
<td></td>
<td></td>
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<tr>
<td>appreciate the look of the connecting pathways</td>
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</tr>
<tr>
<td>feel satisfied with the beauty and aesthetics of this place</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>feel satisfied with the variety of plants</td>
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<tr>
<td>feel satisfied with the biodiversity</td>
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<tr>
<td>feel satisfied with the capacity of the landscape to support social interactions</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>feel satisfied with the maintenance of the landscape</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C

PHOTO-QUESTIONNAIRE

INSTRUCTIONS

Please circle your gender      A. Male         B. Female         C. Prefer not to answer
Please choose your age group  A.18-22         B.23-30            C. Older than 30
Are you an international student? A. Yes         B. No
If yes what is your native country?

Imagine you have been working very hard on a school project (e.g., you just finished a big paper or you stayed up most of the night studying). You know you cannot be productive again until you recover. Please look at the pictures below and rate how much you would be able to recover and get back to work again after spending time in each setting.

[Images of different campus settings with corresponding rating scales]
APPENDIX D

FOCUS GROUP QUESTIONNAIRE

1. There are many things in this place that attract my attention.
   
   Not at all       A little      Somewhat     Quite a bit     Very much
   ☐             ☐               ☐              ☐               ☐

2. There are many things in this place that refresh my mind.
   
   Not at all       A little      Somewhat     Quite a bit     Very much
   ☐             ☐               ☐              ☐               ☐

3. In this place I could be engaged in activities that differ from my daily routine.
   
   Not at all       A little      Somewhat     Quite a bit     Very much
   ☐             ☐               ☐              ☐               ☐

4. In this place I could be away from everyday thoughts and concerns.
   
   Not at all       A little      Somewhat     Quite a bit     Very much
   ☐             ☐               ☐              ☐               ☐

5. In this place I could relax and be at ease.
   
   Not at all       A little      Somewhat     Quite a bit     Very much
   ☐             ☐               ☐              ☐               ☐