
EXPERIENTIAL LEARNING & THE EXPERIENCE OF CYCLING: MODES FOR LEARNING ABOUT BUILT ENVIRONMENTS

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ABSTRACT

This paper explores the relationship between the experience of cycling and experiential learning about the built environment. By integrating cycling into a learning module about multimodal infrastructure, students become the users of the infrastructure they are studying. The act of cycling provides an opportunity to test and reflect upon abstract concepts such as perception, scale, safety, mobility, and legibility within the urban environment.

As part of a six-week educational travel program for undergraduate students of landscape architecture, "Bicycle Day" is an all-day learning module where students explore and document the built environment by bicycle. Exploration is complimented by a lecture and an assigned sketchbook exercise which is completed throughout the day as students navigate and experience a variety of landscapes and urban contexts via bicycle.

This paper offers a case study investigation, using the module of Bicycle Day module as the unit of analysis. The module is considered in the context of David Kolb's model for experiential learning (1984, 2014). The components of Bicycle Day include a lecture, a map of the bicycle network, a sketchbook assignment, exploration via bicycle, and, lastly, a group "laydown" of sketchbooks with discussion among students and faculty. Analyzing each of these elements in relation to Kolb's model of experiential learning reveals that Bicycle Day creates opportunities for learning by offering resolution to the conflicts between the abstract and the concrete, and between observation and action.

The findings of this case study can inform the development of future educational activities within the travel program and beyond. The findings may be useful for creating learning opportunities that focus on multimodal transportation infrastructure, which may become increasingly important to the profession of landscape architecture as ASLA identifies "Transportation for All" as one of six mission areas (ASLA 2023).

Keywords

Experiential learning, field teaching, multimodal infrastructure, bicycles, cycling

1 INTRODUCTION

“Walk. Stroll. Saunter. Ride a bike, and coast along a lot. Explore.” These words are instructions for exploring landscape from landscape historian John Stilgoe (1999). The implication is that the mode of exploration matters. Cycling, driving, sitting on a bus—these modes of travel impact the way a person perceives and understands both space and place. This idea extends to teaching landscape architecture. Fekete and van den Toorn (2021) note that field teaching and learning in Europe utilizes diverse modes including walking, cycling, driving, or riding transit, depending on the context. Educators in landscape architecture can be deliberate in planning and organizing field experiences for students and consider the impact of the mode on learning outcomes. This exploratory paper considers how the experience of cycling can be leveraged toward learning outcomes within landscape architecture coursework. This study builds on research on experiential learning and the experience of cycling. A case study approach examines the role of bicycles within a day-long learning exercise within a larger field trip.

1.1 Experience of cycling

The experience of riding a bicycle has been examined by researchers in multiple fields, including urban design and user experience. Liu et al. (2021) conducted a systematic review of urban design publications relating to cycling. Through their research, they identified a conceptual framework to better understand the experience of riding a bicycle. Their model details three dimensions of the cycling experience: social, sensory, and spatial. The social dimension involves the relationship between the cyclist and their social context. The sensory dimension involves the inputs and feelings that a cyclist might sense while riding a bike. Lastly, the spatial dimension involves how the cyclist relates to space and place, and how a cyclist may understand an environment using features like landmarks.

The framework developed by Liu et al. primarily focuses on external factors. It relates the experience of cycling to the social and environmental contexts in which the cyclist operates. Drawing from research in psychology and user experience, Zhang et al. (2024) present a framework for understanding the Cycling Subjective Experience (CSE). The CSE model puts a greater emphasis on the user as the subject of the experience. The model shows the relationship between sensory interpretation, affective states, and cognitive cognition, and how they make up the user's experience. The inclusion of affective states, i.e. moods and feelings of the subject, highlights how individual the cycling experience can be. This model shares features of the model by Liu et al., but it is distinct in that it is inward facing, focusing primarily on factors internal the individual subject. Both the frameworks discussed above provide a basic understanding of the elements that might impact the experience of a landscape architecture student riding a bicycle.

1.2 Experiential learning

The role of experience in education has been emphasized by many scholars. For John Dewey, “education is a process of living and not a preparation for future living” (1986). Dewey and others have emphasized the learning is about the process rather than content or outcomes. According to David Kolb, “learning is the process whereby knowledge is created through the transformation of experience” (2014). Kolb's experiential learning cycle involves four distinct stages of a continuous cycle. “Concrete Experience” involves experiencing a particular situation, activity, or event. This stage is followed by “Reflective Observation” which entails reflection and consideration of the experience, which builds an understanding of its significance. “Abstract Conceptualization” builds on the reflection in the previous stage to develop concepts, theories, and principles by connecting experiences to concepts. “Active Experimentation” involves using theories and principle to make new decisions which lead to new experiences, which leads back to “Concrete Experience.” (Kolb 2014)

Within Landscape Architecture education, experiential learning in the field is an opportunity to “explore the topics of study actively and in real settings and to learn through hands-on experience – essential to form professionals challenged with making places through planning and design” (Pattacini 2018).

1.3 Bicycle Day

Bicycle Day is an all-day learning module in which students explore and document the built environment by bicycle. It is one part of a six-week educational travel program for undergraduate students of landscape architecture called the Savanna Traveling Program. The Savanna Traveling Program consists of four courses taught by three faculty, who travel with students within and beyond the Savanna ecotone of the

Central United States. It is offered in the Fall semester and is required for sophomore undergraduates in the Bachelor of Landscape Architecture Program. There is a strong emphasis on experiential learning. A major component of the Savanna Traveling Program is the sketchbook, where students document learning and skill building throughout the semester.

Bicycle Day consists of several elements: readings in the course reader which introduce students to the concepts of Complete Streets and greenway design; a short, in-situ lecture about urban mobility and trends in infrastructure; a safety talk & introduction to the bikeshare system; a sketchbook assignment in which students are asked to document a typology of bicycle infrastructure as they explore the city; and lastly, a group “laydown” of all the sketchbooks where students and faculty can discuss the work and the experiences of exploring the city by bicycle.

1.4 Research objectives

The objective of this research is to investigate the potential for bicycle-based experiential learning activities in landscape architecture education. We hypothesize that cycling and other modes of field-based learning may contribute to student understanding of the built environment and multimodal transportation infrastructure. This research connects knowledge about the experience of bicyclists to knowledge about experiential education in order to better understand how bicycling might contribute to experiential learning activities.

2 METHODS

This research uses a case study approach. By examining multiple instances of “Bicycle Day,” the author aims to identify principles and themes that may be applied to other multimodal teaching activities. Three sources of evidence were considered for this case study: documentation, participant-observation, and physical artifacts. First, three years of Bicycle Day were documented: 2018, 2022, and 2023.

Documentation includes teaching materials (lectures, maps, assignments) and information about contextual and environmental factors. Documentation of the three instances of bicycle day is summarized in Table 1. On each occasion, participant-observations were made by teaching faculty and recorded as notes. Faculty also navigated on bicycles and informally met and talked with students throughout the day. Conversations ranged from discussions about bicycle infrastructure, drawing techniques, field measurements, or challenges related to navigating using public bikeshare bicycles. Faculty offered guidance and encouragement as they met students throughout the day. Such participant-observation, in which the observer is playing an active role as teaching faculty in the case being studied, can raise potential for biases in case study research (Yin 2009, 112). Lastly, the researcher considered physical artifacts, i.e. student sketchbooks, as evidence for the case study. The sketchbooks pages from Bicycle Day were examined and discussed twice: first as part a group “sketchbook laydown” and discussion about the day and the drawings; and second, during the grading period after the trip when the teaching faculty flip through each sketchbook individually and assess student learning.

The unit of analysis (Yin 2009) for this case study is the pedagogical module of “Bicycle Day,” and its constituent parts. The case under study here includes the prepared teaching materials (lecture notes, maps, and assignment); the physical infrastructure of the places where Bicycle Day has been implemented; student participation and drawings; and discussions among students and faculty about the experience.

Importantly, this research does not involve empirical measurements of the effectiveness of Bicycle Day. Instead, it represents an exploratory phase of research that seeks to understand the interrelationships between parts of the field learning module. The case study methods outlined above are appropriate as the research seeks to understand how and why bicycle day works, instead of how well it works. This exploratory phase of research may provide useful guidance for future, more empirical studies of Bicycle Day.

3 RESULTS

Bicycle Day has been implemented three times. Each time, students used public bikeshare bicycles to explore and document infrastructure. Student sketchbooks were used to record student observations, measurements, and reflections(Figure 1). The sketchbooks were also the centerpiece of a larger group discussion about multimodal infrastructure in Kansas City, MO, and Omaha, NE(Table 1).



Figure 1. Photos of “sketchbook laydowns” in which students display and discuss their work. Photos by author.

Table 1. Summary of bicycle day characteristics

DATE	2018 (OCT 23)	2022 (OCT 25)	2023 (SEPT 28)
LOCATION	KANSAS CITY, MO	KANSAS CITY, MO	OMAHA, NE
Savanna Trip	Beginning of 2nd trip	Beginning of 2nd trip	End of 1st trip
Weather	H 64 / L 43 ~6mph winds	H 57 / L 42 / ~20mph winds	H 86 / L 56 / ~15mph winds
# of students/ faculty	34 Students 3 Faculty	36 Students 3 Faculty	38 Students 4 Faculty
Bikeshare Org	Kansas City Bcycle	Ride KC Bike	Heartland Bikeshare
Bike Type	Traditional Bike	E-Bike	E-Bike
Station Type	Stations	Dockless	Stations
Cost	\$16/person	\$14/person	\$10/person
Metro Population	2,392,035	2,392,035	967,604
Bike Network Character	Established greenway infrastructure adjacent to rivers and creeks; growing network of on-street facilities with emphasis on greater separation from vehicles		

In each of the three instances of Bicycle Day studied here, approximately 90% of students use bicycles, and the other 10% elect to complete the day’s activities by walking. Students typically spend time exploring areas of the city and its infrastructure by bicycle, then take breaks to reflect in their sketchbooks. Students travel in groups, generally with students who have similar levels of comfort with cycling in a city. Some students travel great distances and explore far flung areas of the city, others are more conservative and stick to infrastructure near the starting point. The choose-your-own-adventure approach means that students have unique experiences, which they can then share with the group through their sketchbooks and discussion. Figure 2 depicts a diversity of student cycling experiences in Kansas City.



Figure 2. Photos from Bicycle Day in Kansas City in 2022. Photos by author.

The sketchbook assignment involves documenting different types of infrastructure through plan, section, perspective, and diagram drawings. Because Bicycle Day takes place sometime in the middle of the 6 total weeks of the traveling program, students are well-versed in sketching and composing information in their sketchbooks. The resulting sketchbook pages are often rich with a variety of drawings and annotations. An example sketchbook spread is shown in Figure 3.

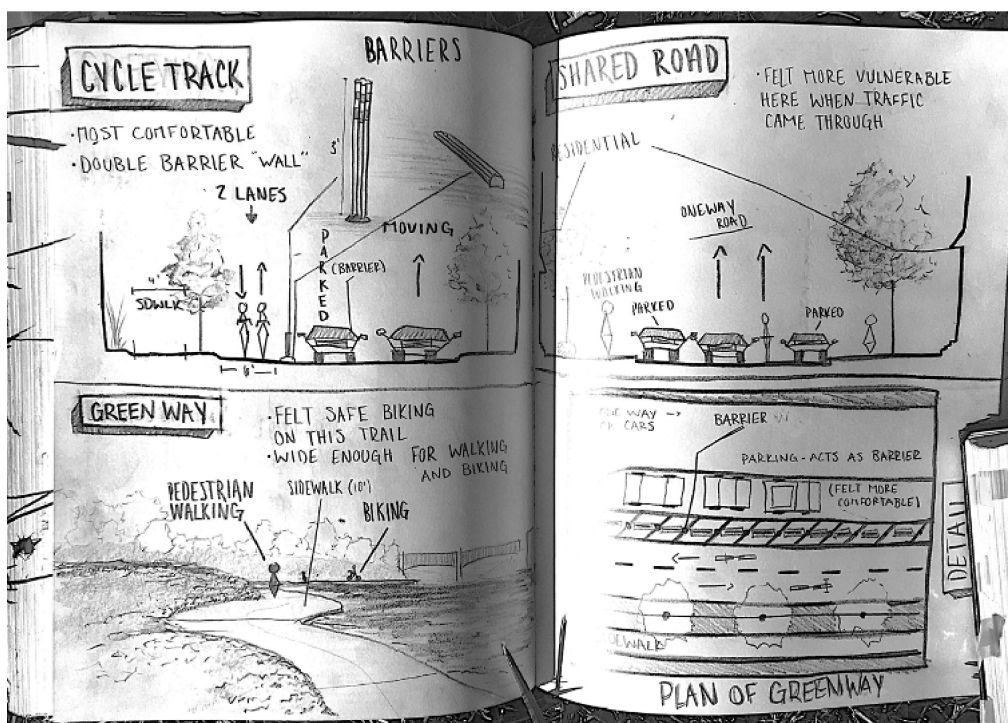


Figure 3. Student sketchbook documenting typology of bicycle infrastructure in Kansas City, MO from 2022. Used with permission from student Adam Larson.

The infrastructure typology assignment, completed in the sketchbook, shows student understanding of spatial dimensions and geometry, as well as reflections about safety, vulnerability, beauty, and interest. Each student's sketchbook is unique, drawing on their unique experiences and reflections during the

module. Through the larger group discussion, students expressed that the experience made them pay attention to aspects of roadways and infrastructure that they previously overlooked.

When considered in relation to the stages of experiential learning, the elements of Bicycle Day connect with each stage of the conceptual model. While riding a bike and the associated sensory inputs represent “Concrete Experience,” elements such as the sketchbook assignment, reading, listening to a lecture, and planning one’s travel throughout the day represent the other key stages of the experiential learning cycle. Other factors that impact experiential learning include external factors like the built environment, the social context, and weather conditions, as well as internal factors like the participants’ mood and affective states. The ways Bicycle Day relates to experiential learning are depicted in Figure 4.

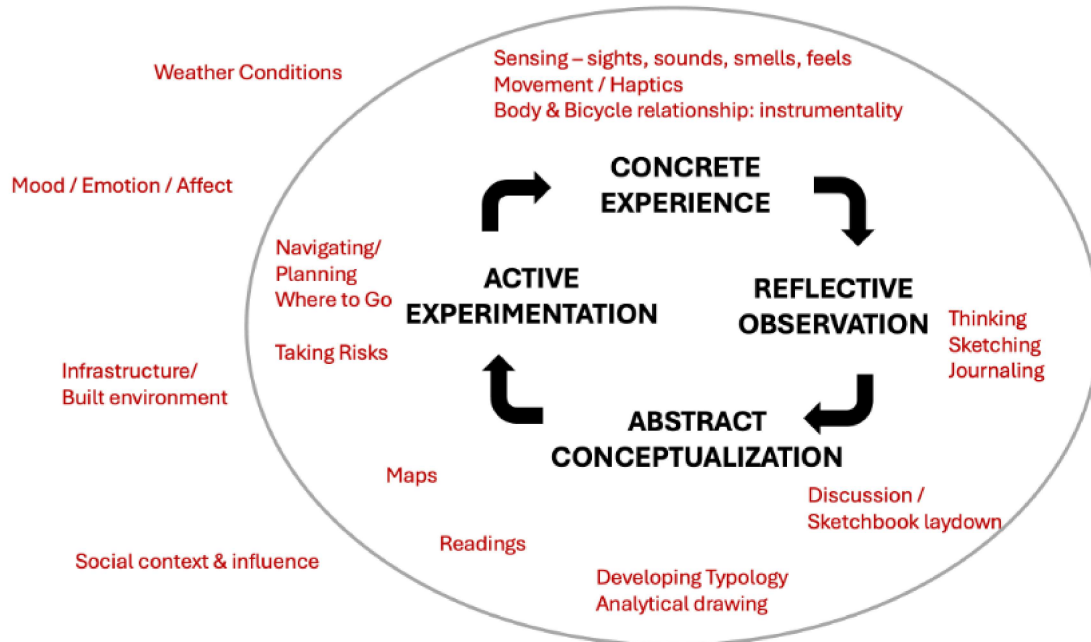


Figure 4. Bicycle Day elements and their relationship to Kolb's experiential learning cycle. Diagram by author.

Bicycle Day is situated within its nested contexts of the educational travel program and the BLA curriculum. Bicycle Day contributes to a larger pedagogical landscape (Letts 2010) which emphasizes learning through diverse experiences in diverse environments (Klein-Hewitt & Gansemer-Topf 2022). Figure 5 shows Bicycle Day as part of larger pedagogical contexts. Experiential learning may take place during Bicycle Day but could also be considered at greater scales of time.

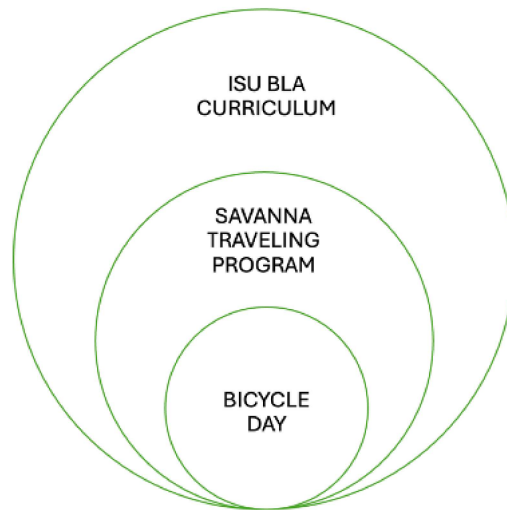


Figure 5. Bicycle Day is situated within larger pedagogical contexts. The cycle of experiential learning may occur at multiple scales. Diagram by author.

4 DISCUSSION

The investigation of Bicycle Day as a case study reveals several themes and questions to be explored in future research. Reflecting on these emerging themes can guide future development of multimodal field learning experiences for landscape architecture students.

First, the accessibility of such experiences is a critical issue. Not all students are physically able to ride a bicycle. Some students have never learned to ride a bicycle. Some students are extremely uncomfortable riding a bicycle in an urban setting or unfamiliar place. The unevenness in abilities and comfort levels is difficult to address, but it is vitally important to creating an accessible and equitable learning environment. The approach of faculty leading Bicycle Day is to set it up as a “choose your own adventure” activity to which students can opt-in. Students can participate in the day’s activities without a riding a bicycle. In fact, if some students choose to walk instead of cycle, it’s valuable to have multiple perspectives when discussing the experiential qualities of transportation infrastructure. Bicycle day has so far relied on public bikeshare systems for bicycles. There are bikeshare systems within the United States that offer adaptive bikes by reservation. Adaptive bikes include handcycles, tandem bikes, and recumbent bicycles for people with disabilities. Such programs could help make bicycle-based learning activities accessible to more students.

Encouraging students to use bicycles to study transportation infrastructure helps develop empathy of diverse users of the built environment. As cyclists, students are the users of the infrastructure they’re studying. This principle of building empathy through experience could be extended to a broader range and spectrum of mobilities and modes. For example, a course that focuses on a diversity of experiences such as those of wheelchair users, people with visual impairments, people riding bicycles, people driving, and people using public transit, might result in a more robust understanding of mobility among students.

The structure and format of travel-based experiential learning is an important consideration. Bicycle Day is structured as a “scavenger hunt”, as opposed to a “walk-and-talk format.” The “scavenger hunt,” which involves students exploring and looking for particular elements in the environment, is beneficial in a number of ways. Again, students become users of infrastructure and are responsible for navigation and interpreting the environment themselves. This adds another layer of understanding and critical thinking. As an alternative approach, the “walk-and-talk” guided tour of environments ensures that all students see and experience the same elements along the tour, and the instructor can give contextual information to enhance student understanding. Both these approaches have merits and should be employed depending on context and experiential learning goals.

The case study presented in this paper helps identify key themes for further research. Importantly, it does not seek to measure the outcomes of the teaching strategies presented. Further research might include methods such as pre- and post- survey instruments to measure learning outcomes among students. Zhang et al. (2024) note that most research related to cycling experience has addressed the *negative* effects of cycling (e.g. potential danger of discomfort), rather than focusing on the *positive* values that cycling yields. There is an opportunity to frame future research around how to optimize positive experiences associated with cycling. Mitigating the negative effects of cycling is undoubtedly important work. But if the negative aspects of cycling are the sole focus, researchers miss an opportunity to explore ways to optimize the positive aspects of cycling. These may include slowness, socializing, sensory richness, place-making, and playfulness (Zhang et al. 2024).

5 CONCLUSION

Activities such as Bicycle Day are valuable because they allow students to experience what they're studying. The goals of the learning module are to introduce landscape architecture students to the language and vocabulary used to talk about infrastructure, help make infrastructure design decisions more legible, and to foster more empathetic designers. All these outcomes also result in landscape architects being better advocates for sustainable, equitable, and joyful transportation infrastructure. This imperative is also recognized by the American Society of Landscape Architects (ASLA), which has designated "Transportation for All" as one of its mission areas. If "Transportation for All" is to be realized by professional landscape architects, educators need new pedagogical approaches for teaching students about multimodal transportation and infrastructure. Multi-modal, experiential learning may fit the bill.

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