

# Student Perspectives on Classroom Experiences across the UVM Campus



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**Vermont Field Studies - Geography 192 SL**

Fall 2016

**Service Learning Partner:** Brian Reed, Vice Provost for Teaching and Learning

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# SUMMARY

## Project Overview

In Fall 2016 Vermont Field Studies (GEOG 192 SL) students conducted research to better understand how instructors and students experience specific classroom spaces on the University of Vermont campus. Our service learning partner was Brian Reed, Vice-Provost for Teaching and Learning.

## Methods

This research drew on two surveys, as well as classroom observations, and information gathered from meetings with campus leaders on classroom design. We observed both physical features (room design, lighting, temperature) and social features (student interactions with professors and each other, seating locations chosen by students) of the classrooms which gave insight into how students are operating within the classroom. We directly observed classes of different formats, including a studio, seminars, lectures and labs. Also taken into account were the informal spaces students use for studying, learning, and social interaction.

## Findings and Recommendations

Most students were content with classroom spaces, although minor improvements were universally suggested. Statistically significant relationships between classroom rating and light, temperature, and comfortability were discovered. Larger philosophical questions of parity across campus and teaching methods were considered. Research shows that student academic performance improves when students are engaged in active learning environments. The main proposition for the continuing evolution of UVM classrooms is to move them toward Active Learning Classroom (ALC) environments, a process which can begin by changing teaching styles, and making modifications to existing traditional classrooms to increase ACL functionality.

- Professors should be taught **emerging teaching techniques** that use existing resources, such as Blackboard, to the fullest advantage. **Instructor trainings** on the connections between spatial relationships in the classroom, active learning, and student outcomes should be offered.
- Where possible, classrooms should be converted to **flexible spaces** with movable elements such that small group work, makers' labs, and larger group discussions are possible.
- Existing lecture halls can be improved by making them incrementally more student-centered by **replacing equipment** and continuing **general maintenance**.
- **Informal meeting spaces** such as cafes, seating nooks, solariums, and lounges are important places for interactions among the academic community. Such spaces should be included in academic building designs.
- **Future research** should be conducted in the following areas:
  - Student reactions to the active learning features of the STEM Complex
  - Instructor attitudes and recommendations regarding the classrooms they use
  - Attitudes toward and uses of non- and partially-academic spaces on campus

# INTRODUCTION

In Fall 2016 Vermont Field Studies (GEOG 192 SL) students conducted research to better understand how instructors and students experience and use specific classroom spaces on the University of Vermont campus. Our service learning partner was Brian Reed, Vice-Provost for Teaching and Learning. This report summarizes our research methods, literature on the relationships between classroom space and design, teaching, and student learning, and our research findings. The report closes with recommendations for future classroom design, innovations in teaching, and questions for future research.

## Classrooms and Courses Analyzed

<b>Room</b>	<b>Course Information</b> (anonymized)	<b>Student Researcher(s)</b>
Aiken 102 (Lecture Hall)	Natural Resources lecture course 100 level, required course 90 students	Harry Silbaugh
Lafayette 108 (Lecture Hall)	Anthropology lecture course Introductory level, diversity course 109 students	Jamie Duke
Lafayette 108 (Lecture Hall)	Geography lecture course Introductory level, diversity course 109 students	Zeb Bolduc
Lafayette 207 (Lecture Hall)	Geography lecture course Introductory level, diversity and sustainability course 109 students	Jenny Millan
Lafayette 203 (GIS/Computer Lab)	Geography lecture/lab course Introductory level 13 students	Brittany LeBeau
Old Mill 219 (Seminar Room)	Geography seminar course 200 level 13 students	Alice Urbiel
Aiken 103	Interdisciplinary studies	Lucy Crane

(Classroom/Meeting Room)	course with lab sections Introductory level, sustainability course 13 students	
Rowell 110 (Classroom)	Interdisciplinary studies course Introductory level 41 students	Izaak Herman
Williams 305 (Art Studio)	Studio Art class (2 sections) Introductory level Section A: 13 students Section B: 16 students	Liam Paus Joe Krayewsky

*Table 1. Classes and Classrooms Studied*

## METHODS

We used a mixed-methods approach, employing both qualitative and quantitative research methods. These included an initial paper, initial survey, an online end of term survey, participant observation, and formal research meetings with campus leaders of classroom design. Qualitative data were hand coded and quantitative data were analyzed with the SPSS 23 statistical program. Each of the researchers was assigned to study one class; in some cases, two researchers studied the same classroom, with different classes. The researchers observed each classroom three times.

For the first observation, a paper survey was given to the students in the classroom with an array of qualitative and quantitative questions that were designed to capture how the students feel about the classroom. For the second and third visit to these classrooms, researchers sat with the rest of the students during the class and conducted participant observation. Participant observation is a method common to human geography and cultural anthropology in which the researcher goes beyond simply seeing and observing, but interacts at various levels, becoming a participant of what is being studied (Kearns 2010). In this case, in each classroom researchers were studying, students participated by listening to the lectures or observing the activities while noting observations that were important to the central questions of this project. To conclude our project, we designed and administered an online questionnaire for students, to capture any changes in their feelings about the room. No survey was compulsory. The research was approved by the Human Subjects Research Committee.

We used the statistical program SPSS 23 to analyze the quantitative results and hand coded the qualitative responses. Together, these two methods helped us organize the data and break it into themes. This mixed-methods approach helped us gauge how students feel about the

classrooms; moreover, the information produced by these research methods can help shape future classrooms.

In addition to conducting research on student experiences of selected classrooms, our class attempted to learn more about how future classroom spaces are designed. We met with UVM's Director of Capital Planning and Green Building Coordinator. We also met with the Senior Associate for Medical Education and Director of Technology Services at the UVM Medical School and visited an active learning classrooms. Finally, two students attended a tour of the new STEM, currently under construction. These meetings influenced our recommendations for modifications to existing classrooms and the design of new learning spaces on campus.

## RESEARCH ON CLASSROOM DESIGN AND LEARNING OUTCOMES

Although studying the room in which a class is taught may seem less obvious than studying the methods, content, or instructor, "Scientific research shows how the physical classroom environment influences student achievement."<sup>1</sup> In 2014, a study by Cheryan on academic achievement across different classroom atmospheres found two major categories of environmental features that influenced learning: structural features, such as lighting, air quality, noise, and temperature; and "symbolic features, such as objects and wall décor." Negative features in either of these areas significantly reduced students' learning outcomes. Cheryan also noted that these deficiencies were correlated with schools that serve largely minority or lower-income students.

Factors that influence learning outcomes can also affect the relationships students develop with their instructors. Lei (2010) conducted a study to see whether a correlation between physical attributes in classrooms and academic success existed, and found that classrooms with arrangements that promote more eye contact between students and instructors create more adequate interactions, which aid in learning.<sup>2</sup> Classrooms that fit this description tend to be wide and shallow, rather than narrow and deep. Lei also reiterates the importance of structural elements, including lighting, noise, and temperature, but also the room's footprint, furniture layout, accessibility of computers and media, and even the color. Deficiencies in any of these categories can lead to more than hassles that distract students from their work; they can also have an effect on the psychological state of the room's inhabitants, influencing their "emotional state, task performance, and attention span."

Some more drastic ways to alter the classroom environment rely heavily on modern technology. One practice that can be used in almost any classroom, but completely changes the students' relationship to the space, is to flip the classroom through the use of video lectures that are

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<sup>1</sup> Cheryan, S. et al. (2014). "Designing Classrooms to Maximize Student Achievement." *Policy Insights from the Behavioral and Brain Sciences*, 1(4), 12th ser., 4-12. doi:10.1177/2372732214548677

<sup>2</sup> Lei, S. A. (2010). "Classroom Physical Design Influencing Student Learning And Evaluations Of College Instructors: A Review Of Literature." *Education*, 131(1), 128-134.

viewed at home and discussed in class. Pierce & Fox (2012) found that students scored significantly higher on a final exam in a semester in which a particular class had been flipped than in those in which it hadn't.<sup>3</sup> A traditional lecture gathers students in the same room, only to create a one-way flow of information in which they are learning in parallel but separately from one another. Flipping the classroom has this form of learning take place at home, when the students are already dispersed, and then uses the valuable time when the students are in the same space for activities that require them to interact with each other.

Still greater changes include online classes that abolish the classroom entirely, in favor of online spaces similar to Blackboard. Carmean & Haefner (2002) addressed concerns that such a class could create a feeling of placelessness in its students, or only work for certain topics.<sup>4</sup> They found that the online portals could become places in themselves; since the students access them routinely and for a specific purpose, they accumulate the same layers of meaning that a physical space might. They also found that the benefits this form of learning allows are almost universally applicable; they list these as "deeper learning" that is "social, active, contextual, engaging, and student-owned."

For classes that retain a physical meeting place, using an active learning classroom has similar advantages, while allowing students to meet each other and the instructor face-to-face to develop the relationships that are also crucial to learning. Lasry (2016) found that it is true that instructors must adapt their teaching styles in order to use the new features of these classrooms to their fullest.<sup>5</sup> The same study also found, however, that when instructors did not adapt, "the technology-rich classroom is not significantly different from conventional teacher-centered classrooms." Although this does not indicate any benefit, it also means that active learning classrooms were never worse than conventional classrooms, despite the additional opportunities for distraction.

We also consulted Alexander, Ishikawa, and Silverstein's *A Pattern Language*, a design and architecture book that emphasizes small, human-scale interactions. It gave us a model for encouraging decentralized, individual relationships among students and professors, perhaps mediated by online communications as described above.<sup>6</sup>

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<sup>3</sup> Pierce, R., & Fox, J. (2012). "Vodcasts and Active-learning Exercises in a 'Flipped Classroom' Model of a Renal Pharmacotherapy Module." *American Journal of Pharmaceutical Education*, 76(10), 196.

<sup>4</sup> Carmean, C., & Haefner, J. (2002). Mind over matter: Transforming course management systems into effective learning environments. *Educause Review*, 37(6), 27-34.

<sup>5</sup> Lasry, Nathaniel et al. "Changing Classroom Designs: Easy; Changing Instructors' Pedagogies: Not So Easy..." *Amazonaws*. N.p., 2016. Web. 4 Nov. 2016.

<sup>6</sup> Alexander, Christopher, et al. *A Pattern Language*. New York: Oxford University Press, 1977. Print.



*Figures 1 and 2. Vermont Field Studies students conducting research and fieldwork*

## FINDINGS

### Initial Classroom Survey

Over the course of the 2016 fall semester at the University of Vermont, we observed 10 classes taught in 8 classroom spaces to learn if there are any correlations between specific classroom design elements and student learning experiences. To accomplish this objective, we gave a survey to students in each of the classrooms observed. A total of 430 students took the first survey: 105 which were first-year students, 190 second-year students, 80 third-year, and 55 fourth-year (Figure 3). They reported taking the course for multiple reasons (Figure 4). We performed a statistical analysis on answers to the first survey to determine if there were any significant relationships between the responses. Significant relationships between responses could indicate variables that affect student experiences in specific classroom and specific classes.

We found no significant relationships between year in college and overall classroom rating, course type and overall classroom rating, reason for taking course and rating of room, location of student seating (prime or marginal) and classroom rating, course type and comfortability, and location of student seating and their ability to hear or see the teacher. These comparisons indicate that student year in college, seating location, course type, and reason for taking class do not affect the overall rating of the classrooms. These findings also suggest that course types (i.e. lecture, studio, etc.) do not affect the perceived comfort of the room. Most students reported that they can see and hear well in most classroom settings studied.

*Figure 3. Number of students who took the first survey by their year in college*

### *Classes with/without windows and overall rating*

We found that a relationship between classrooms with or without windows and the overall rating of the classroom ( $p < .001$ ). Those with windows received a higher rating. Based on our observations, it may be that the relationship between presence or absence of windows and overall rating varied between course types (i.e. lecture, studio, etc.).

### *Temperature and comfortability rating*

There is a relationship between a high rating for comfortable temperature and a high overall rating of the classroom ( $p < .001$ ). We suggest that those who say they are usually or always comfortable in a given classroom are naturally more likely give that room a higher rating.

### *Specific courses and overall classroom rating*

We found a relationship between specific courses and the overall rating of the classroom ( $p < .001$ ). Students who were in the mid-level natural resource class in Aiken 102 were more likely to have a neutral or 'needs improvement' rating than were other course. This suggests that students may have negative perceptions of a room or a particular course, and these may influence one another. Three out of the four small classes received overall high ratings, with a fourth receiving a mixed rating. Although responses to that course were mixed, the overall rating was still high. Overall, students in smaller classes are more likely to give the class an overall high rating.

### *Comfortability and overall rating*

Comfortability and overall rating of the classroom had a significant relationship ( $p < .001$ ). Those rating the classroom as comfortable were more likely to rate the classroom overall as good or ideal for the course type (Figure 4). In general, more students gave positive than neutral or negative responses.

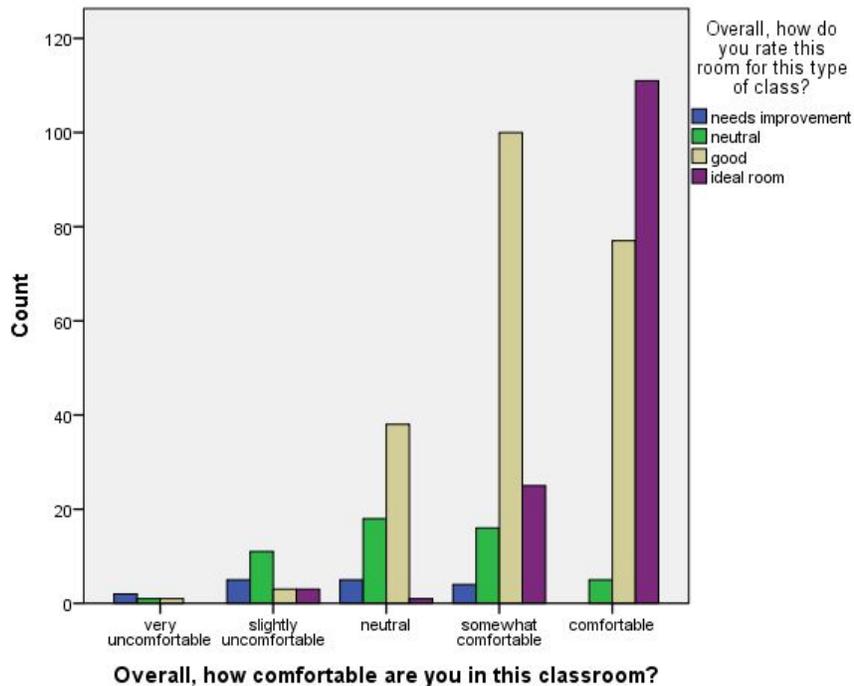


Figure 4. Relationship between classroom rating for course type and classroom comfortability

### *Classroom temperature rating and overall rating of classroom*

We found a significant relationship between the temperature rating of the classroom and the overall rating of the classroom ( $P < .001$ ). If students rate the temperature as usually comfortable or very comfortable, they are more likely to rate the classroom as good or ideal.

### *Classroom temperature and comfortability rating*

We also found a significant relationship between classroom temperature and rating on comfortability ( $p < .001$ ). This relationship indicates a correlation between satisfaction with the temperature and comfort.

## Follow-Up Survey Results

An on-line follow up survey was emailed to students in the designated courses and classrooms via their course instructors. The survey was completed by 191 students from the nine courses studied. Males made up 56.3% of the respondents, females 41.1%, 2.1% preferred not to say and .5% were transgender. Of the students who took this second survey, 50% were

sophomores and the other 50% distributed fairly evenly among the other years. There were a few large classes involved in the study which are usually taken by first and second year students, which may explain the unusually large number of sophomores. A majority (70%) of students replied that they like the classroom experience, and 73.3% of students said that the classroom was a good or great match for the type of class that they were taking. A majority of students indicated they value having whiteboard/chalkboard in the room, a professor who moves around the classroom while teaching, and natural lighting.

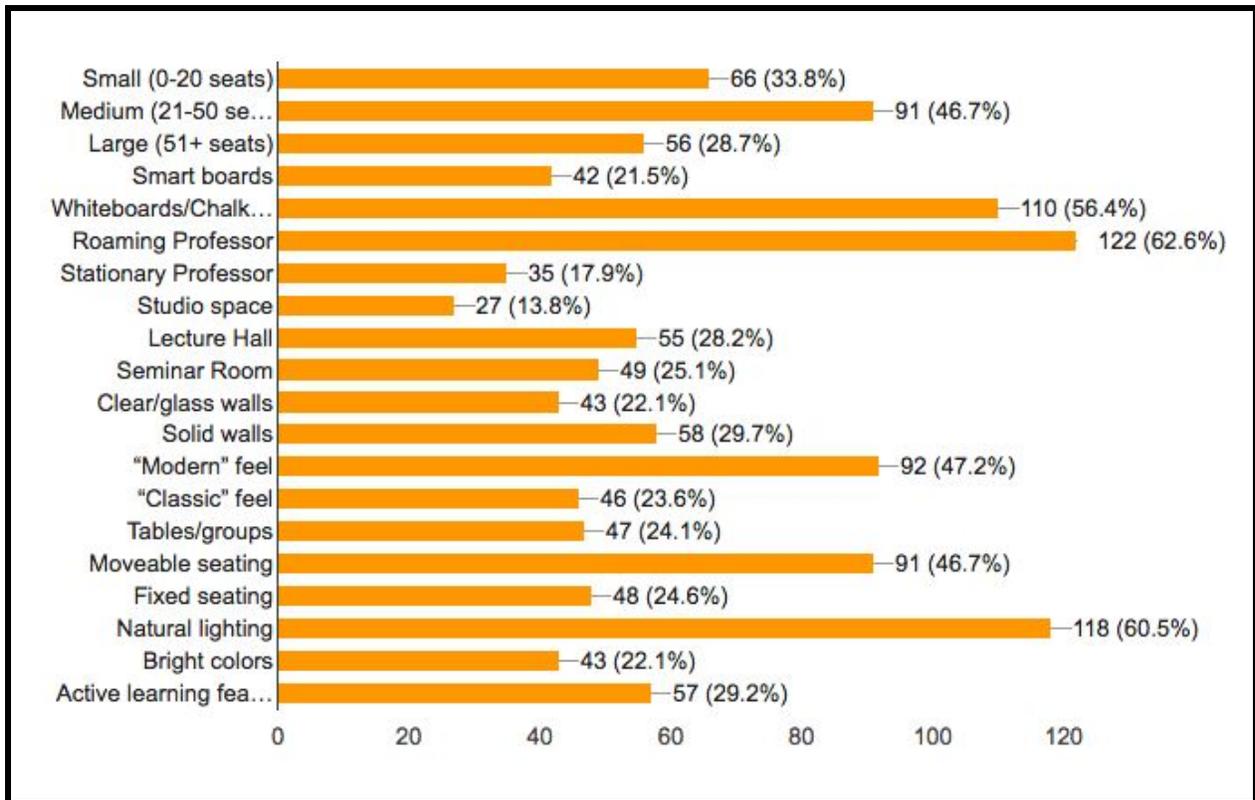


Figure 5. Student ratings of specific features of classrooms or instruction style

## Other spaces on campus

We also questioned students about their use of non-classroom spaces on campus. Natural light was important to 45.5% of students; the other half did not have a significant preference. Close to one hundred percent (95.8%) of respondents reported that they studied on campus sometimes or often. Many responded that they like to study in the Davis Center, including Brennan's and the "fishbowl," a reference to the Mansfield Room. Others preferred to study in their dorms. Only 8.9% of students said that they took classroom into consideration when choosing their class. It seems that spatial characteristics are important to those who do not like their classroom but students do not proactively avoid classrooms they do not like.

# CLASSROOM PROFILES

## *Aiken 102 - Harry Silbaugh*

The first class surveyed for our research is an intermediate-level natural resources course. It is a lecture style class, meeting in Aiken 102. Just over 80 students are enrolled in the class, and 70 responded to the first survey. The students in the class are predominantly sophomores and juniors, and almost all of them are taking the class as a requirement for their major.

Students seemed happy with the physical aspects of the space, such as temperature, ability to hear and see, accessibility, and comfort. They were less happy with the air quality, layout, and adjustments (or lack thereof) made by the professor to make the space more suitable. Although the discontent with these aspects was not severe, qualitative descriptions of the mood and additional comments were very negative.

The negativity is partially based on the space, but is mostly a reflection of how students feel about the class content. The two common complaints about the space are that there is not enough natural light, and that the chairs are both uncomfortable and inconvenient. The seats are bolted down too far from the desk, forcing students to sit on the edge of the seat. Additionally, there is inadequate space in the rows to allow a person to get up and go to the bathroom without making everyone else stand up. In the 'mood' field, many people responded that it was 'anxious,' 'frustrated,' 'bored,' or even 'hostile.' Others indicated in their answers that the discontent was directed at the subject matter of the class, not the room itself.

Upon observation, most of the students indeed appear unhappy in the room. Many of them bring food and coffee, which they eat at the desk, suggesting that it may be their first class of the day. Participation is evenly distributed throughout the space. The students who sit in the front row, or in the space directly in front of where the professor teaches, answered the most questions, and seemed the most involved during small group activities. The area in which students seemed to pay the least attention was the Southwest quadrant, farthest from where the professor stood.

## *Lafayette L108 - Jamie Duke*

The following findings are for Lafayette L108, a large lecture hall. The course was an introductory-level class held in the afternoon. The course fulfills a diversity requirement (D1), and it is known that students tend to rate these courses lower than non-diversity courses. Therefore, student responses may be skewed.

Demographically, over half of the students (61%) were second-years. First-years were next most common, at 26.8%, with third and fourth years at under ten and five percent, respectively. A similar distribution appears among the reasons for taking the class, with 61% taking it as a distribution requirement, 24.4% taking it as a major requirement, and less than five percent each taking it as a minor requirement, elective, or 'other reason'. The fact that the class

is a D1 credit probably makes it unusually commonly taken for distribution, and the fact that it is a 0-level class that students take early suggests they want to get it out of the way as quickly as possible.

Overall, this room had an average rating of almost exactly 4 out of 5. The most positive rating was given to the acoustics, which averaged 4.7; the lowest was the air quality, which rated 3.9. An analysis of the ratings given for various locations within the room revealed no statistically significant difference between the prime and marginal areas.

Twenty-three students reported that the space felt academic or professional. Another 23 reported that it made them feel anywhere from calm to tired. Ten gave more unambiguously negative responses, including that the room was “fatigu[ing]... very grey” and, conversely, “Sometimes it feels a little too well lit/bright.” Surprisingly, no one complained about the class’s subject – or, less surprisingly, no one admitted to doing so – but one student perceived such a reaction in others, saying, “It’s a D1 so people are generally unethused [sic].”

By far the most common complaint about the classroom is that the chairs squeak horribly. Twenty-one students requested that the squeaking be addressed, some in colorful terms, such as “the [squeaking] is honestly a tyrannical sound.” Other complaints about the chairs included that they are packed too tightly and the way they swing, which can happen unexpectedly. Although no distinct ‘shadow zone’ appeared, two people reported that the media console blocked their view. The room was variously reported as being too hot and too cold. Some people described the room as dank, being “gray” and requiring “better airflow” and that the lights be turned on so as not to feel like a “dungeon;” in a similar vein, one plaintive response read, “I just want windows.” One student rightly took issue with the idea of lecture halls as a whole, saying, “I prefer smaller classes and sitting in circles. This creates clarity and equality.”

The lack of apparent shadow zones, and the overall high rating of the room despite the lecture format, may be because the space is a small one, as lecture halls go. During my observations of the class, there did not seem to be a gradient of attention that decreased toward the back; even those in the rearmost row seemed to be able to attend to the lecture. Still, the room demands a passive learning style, with students watching, listening, and taking notes, but not contributing unless the instructor explicitly asked questions or, rarely, opened very brief class-wide discussions.

### *Lafayette L108 - Zeb Bolduc*

The summary provided below was for a mixed-level anthropology course focused on food and culture. This class was located in Lafayette room L108 and occurred Monday, Wednesday, and Friday from 9:40am-10:30am. Because this class also fulfills a diversity requirement for many students, it should be noted that students typically rate these classes lower than others, although this class did not appear to be affected.

The classroom is composed of primarily first year students (35.5%), followed by second year, (25.8%), fourth year (22.6%), and third year (16.1%) . The reason most of the students are

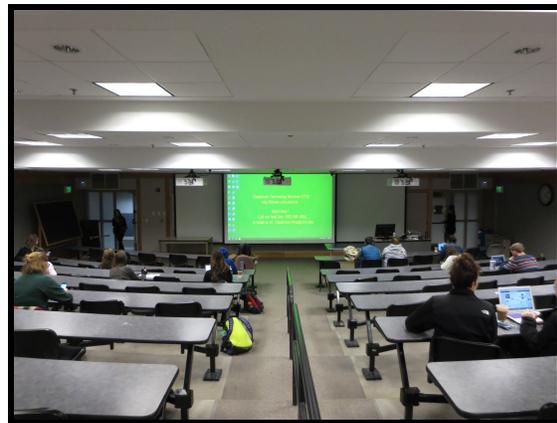
taking the class is for elective credit (43%). The overall rating of the class is very good, with 48.4% of students who responded saying that it was “good” and 46.2% that it was “ideal.”

Nearly half (48.4%) of students who took the survey marked themselves as seated in “prime” seating (front few rows and center section) and 30.1% of students marked themselves as sitting in “marginal” areas (outer- and rearmost seats).

All but three of the students who responded to the survey gave a positive response for the mood of the room. Although students suggested that the room should both be cooled more or heated more, there was no consensus between these two suggestions. A common theme that can be drawn from these suggestions is “temperature regulation.” Another suggestion that appeared frequently in student responses was to fix the chairs. Many students said they were too squeaky, and were not comfortable. This response does not agree with the majority of the responses for the question of comfortability, where 61.3% said they were comfortable.



*Figure 6. Lafayette L108*



*Figure 7. Lafayette L108*

### *Lafayette L203 - Brittany LeBeau*

Observations of this classroom have been made three times over the course of the semester. This course consists of a white male instructor and eleven white students of various genders. The initial survey was distributed to the class on Wednesday, 5 October 2016, a day when eleven out of thirteen students came to class. Most students are in their third year of undergrad (8 students), with one student a sophomore and two students seniors. Most students are taking the course as a requirement for a minor (7 students), and some are taking it as a requirement for their major (4 students).

The majority of students rated the ability to see the screen, podium, or white board as 4 (mostly visible), and the audibility within the room was given ratings of 4 and 5 (I hear almost everything to I hear everything). The layout of the room was given an average rating of “comfortable”, with 5 students giving it a 5 (spacious/comfortable), and 3 students rating the layout as 4 (mostly comfortable). There were 2 ratings of 3 (okay) and one rating of 2 (tight, hard to access). Other elements of the classroom, such as temperature and air quality, were given average ratings of 4 and 3, respectively, meaning the students think the temperature is

mostly comfortable and the air quality is tolerable. Most students answered that the instructor doesn't need to adjust the room in any way to make it work better. This classroom is, on average, close to other classrooms and spaces these specific students use on campus.

Overall, students are comfortable in this classroom. The majority of ratings were 5 (comfortable), with only three ratings of 4 (somewhat comfortable) and one rating of 3 (neutral). The fitness of this classroom for this type of class got ratings of 5 (ideal room) and 4 (good). The mood of the room, an open-ended question, received a couple answers of "busy", with other generally positive responses such as "fine", "relaxed but ready to get down to business", and "Bright, fresh, perfect". Other responses were "quiet", "Techy", "learning", and "8:30 in the morning is the mood". There were a few suggestions that students and the instructor made, such as removing the computer outlets and plugs from a vulnerable position on the floor, updating the projector, and getting better windows. One student mentioned "computers tend to block the board a little, but that's somewhat inevitable with computers".

The results of the follow-up survey for this classroom show that students have diverse preferences for classroom spaces; one preferred "classic" lecture hall settings, while another responder prefers small, modern, seminar-style classrooms. The preferred classroom size varied (from Small, 0-20 seats to Large, 51+ seats), and some responders favor a mobile instructor over a stationary instructor (and vice versa). Overall, no significant results came from the follow-up survey on the preferred learning spaces of students.



*Figure 8. Lafayette L203*



*Figure 9. Lafayette L203*

### *Lafayette L207 - Jenny Millan*

The following findings are from an introductory, lecture-based geography class, held in Lafayette L207. Of the 94 students who responded to the survey, 29 were first years, 46 were sophomores, 12 were juniors, five were seniors, and two were fifth-year students or later. The most common reason students took the class was to fulfill a distribution requirement (44 students). However, many participants instead reported 'requirement for major' as their reason for taking the class (26 Students). Very few of the students who participated in the survey were taking the class as an elective.

The survey results indicated that most of the participants could see the screen, podium, and whiteboard, and hear the instructor and any audio used. The average visibility for the participants was 4.4 out of 5, and the average rating for 'ability to hear the instructor and any audio used' was even higher, 4.6 out of 5. Together, these scores indicate that the vast majority of the participants could hear everything or almost everything in the room. Though the arrangement of the chairs, desks, and tables, and the temperature and air quality of the room still reported generally favorable ratings, the results indicate that most of the respondents think that each of these categories could be improved. For instance, most people thought the the temperature of the room was 'very comfortable', 'usually comfortable', or 'okay'; however, a couple of outliers thought that the room was usually too hot or cold. These outliers affected the average. Additionally, most of the participants reported that the room was accessible to other classrooms and spaces on campus. Answers were mixed to the question "Does the instructor adjust the room in any way to make it work better?" This question had the most varied array of answers, ranging from 'yes, always' to 'no, never'. However, when the instructor and TA were asked a similar question, "Do you adjust the room in any way to make it work better?", they both answered that they always did so. The student surveys resulted in an average 'instructor adjustment of the room' of 3.5 out of 5, with a mode of 4, meaning that most people thought that the instructor frequently adjusted the room, or didn't need to adjust the room. Nevertheless, some students thought that the instructor rarely or never adjusted the room. Perhaps these student outliers illustrate that the instructors need to adjust the room to better suit these students.

All in all, the majority of the respondents had a positive perception of the room. In fact, 36 of the respondents said that the room was ideal for this lecture style class, 47 of the respondents thought it was good, and 11 neutral. Additionally, the room also had very high ratings for comfortability, with 42 participants believing that the room was comfortable and 41 participates believing that the room was somewhat comfortable. Some of the most common responses out the general mood of the room were: productive, positive, good, engaging, quiet, relaxed, cool, calm, and cool. The biggest suggestions for the the room from the students were to de-squeak the chairs, fix the chairs, add more chairs, and make more space in between the rows. Likewise, both the instructors also suggested that the chairs need to be de-squeaked.

### *Rowell 110 - Izaak Herman*

I studied an introductory level course held in Rowell 110. There are 41 students enrolled in the classroom; 31 responded to the survey I administered. The course in this room is a lecture-based class; of the 31 students who responded, most were either taking the class for a distribution requirement or as an elective class. Other students were taking it for major or minor requirements, but such responses were a small minority. About 40% of the students who answered this survey are 1<sup>st</sup> year students. The rest were split fairly evenly between 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> year students.

Students reported they could see and hear the instructor; most of these answers were either a 4 or 5. For the Likert 'arrangement of class' question, the comfort students had for the

arrangement for the classroom was still positive, but leaning more towards neutral; more students put down 3s or lower. Many of the students who responded lower than a 4 for this question wrote in the comments that the layout of the classroom was uncomfortable because there were too many desks for the number of students which made it cramped. However, even some students who put a 4 for this question still complained about this issue in the comments or suggestions. Most of the students felt positively about the quality of air in the classroom; 75% percent of the students gave a 4 or 5 for that question. For the accessibility of the room question, most students felt either neutral or positive, giving either a 2 or 3 on a scale of 1-3.

Answering “how comfortable you are in this classroom”, 72% of the students responded with either a 4 or 5. Of the students who gave a 3 or less, many of these students commented about there being too many chairs. Ninety percent of the students gave either a 4 or 5 for the rating of the room. Most of the answers given for the mood of the room were either neutral or positive, saying either “casual” and “reasonable” or “pretty welcoming and easy to talk in” or “positive environment \*thumbs up\*”.

Overall, students tolerated or liked this classroom.. However, based on some of the comments, there are some improvements that need to be made. It was commonly complained that there are too many desks, making it a cramped space, and that desks could be taken out to make it a more capacious. I sat in one of the classroom’s sessions on a day that students had to give group presentations. When it was a new group’s turn to present, I observed that they had to go all the way to the end of the row to get out of the clump of desks and proceed to walk to the front of the classroom for their presentation. This trip students made to get out of the maze of desks and to the front of the classroom was made more difficult the excessive number of desks. Finally, another suggestion was the students’ desire for natural and better lighting.

### *Williams 305 - Joe Krayewsky & Liam Paus*

Williams 305 is an open studio classroom in which two classes were surveyed and observed. The first class consisted of 14 students of every grade level (First year-Fourth year). The class was primarily composed of second year students, with five present, followed by four first year, two third year students and two fourth year. After review of the survey, it becomes evident the students enjoy the layout of the room, with an average score of 4.3 /5. When asked to describe the mood of the room the common responses were: artsy, open, calm, and casual. Students were observed in this space were either individually working while plugged into their phone or, on occasion, engaging in occasional conversation with each other. It becomes clear that this room is serving its purpose in stimulating creativity. There is still room for improvement, however, with student suggestions of improved airflow/temperature with either the installation of fans or air conditioning. Another common issue brought up was the need for more comfortable chairs. At the moment the only seating available is on stools with an unforgiving wooden seat. With these student-suggested improvements I believe this classroom would be an ideal art studio.



Figure 10. Williams 305



Figure 11. Williams 305

The second class we observed had sixteen students in the classroom. They sat in small groups, with most of them not appearing to know anyone outside of the class. Almost every student had headphones in, and there was minimal talking between them. Upon entering the room, the students gravitated towards specific seats, yet they were not assigned. The professor made small talk with the students, and many gave brief responses and then proceeded to remain quiet. There was a mix of males and females at each table; they did not separate by gender. The students gave us incredible feedback on the surveys, but did not verbalize any complaints in class. They seemed to work efficiently in the space, but pointed out that the temperature is always at one extreme or the other, and the need for more accommodating tables/chairs. We did not notice anyone reposition themselves out of the way of sunlight, or to another spot for any reason. The mood of the classroom lined up perfectly with that of our data: it was independent, happy, and overall a good classroom experience that we felt, even being there for only a fraction of the class.



Figure 12. Word Cloud of Williams 305 student responses to room mood

Nevertheless, combining suggestions across both classes, some improvements could still be made. Better furniture might include adjustable stools, tables with wheels, and a media

desk for the professor, along with expanded storage consisting of both shelves and flat drawers for students. Other suggestions were for better control over the lighting, such as curtains that block more of the light and then better artificial lighting for presentations - the latter because natural light has a tendency to overheat the room. Better temperature controls were also requested in general. As an art room, another suggestion was for more sinks.

### *Old Mill 219 - Alice Urbiel*

The Geography Department's seminar room (room 219) in Old Mill is on Central Campus. The course being taught in the room is an upper level seminar in the social sciences. Most students are seniors and taking the course to fulfill a major requirement, although a few are taking it as an elective and one for a distribution requirement.

Most students responded with highly visible (5) or mostly visible (4) for ability to see, and 'I hear everything' (5) or 'hear mostly everything' (4) for ability to hear. All students felt that the instructor could see them from where they were sitting, while the instructor did not feel she could see all the students.

Arrangement of chairs varied between tight and hard to access (2), okay (3), and mostly comfortable (4). Twelve out of the thirteen respondents, including the instructor, rated the accessibility of the classroom as 'close to other classrooms/spaces I use' (3). Responses for how often the instructor adjusts the room varied.

Temperature was marked either usually too hot/too cold (2) or okay (3), with one response for usually comfortable (4). Air quality responses were somewhat more varied but the majority responded 'okay' (3).

Only the instructor responded with slightly uncomfortable (2) for overall comfort while the students ranged between neutral (3), somewhat comfortable (4), and comfortable (5). The overall rating was also largely rated 3, 4 and 5, with the instructor and one student marking needs improvement (2).

A general consensus emerged that the room is good for conversation and discussion, and is comfortable, quiet and intellectual. Two of the most common suggestions were to fix the airflow and to make a different table arrangement other than the "T" shape. Having an overhead projector was also suggested, which I agree would make the room more adaptable. Information could be put up on the board in this room without having to go over to the next room and presentations could be done to small groups.

I observed the classroom on October 25<sup>th</sup> and found I was not too hot or too cold while sitting in the back by the window before moving to the chair by the door. I noted that this classroom is great because of all the table space. I had just come from Lafayette L108 where I always feel cramped into the desk and don't want to intrude on anyone else's space. Here, everyone had their laptop open; some people were eating or engaging in friendly banter. There were project outlines on the board to sign up for so people were talking about that before class started. The instructor sat at the table and was on the same level as her students when class began and they discussed their project proposals. The room layout made it easy to work in small groups. After the group work, the class shifted into student-led discussion on an article

they had read. The large table and small class size made this activity possible and more meaningful than if it had taken place in a bigger lecture hall. I also observed the classroom on November 8<sup>th</sup>, which was the last day of student-led discussion. The energy and mood was the same, as students were doing their last day of discussion leading.



Figure 13. Old Mill 219



Figure 14. Old Mill 219

### *Aiken 103 - Lucy Crane*

This report outlines the findings of research done on a lab class that meets in Aiken 103. There are 13 students in the class: seven second-years, five third-years and one first-year. Nine of these students are taking this class as a major requirement, two as a requirement for their minor, one elective and one for another reason. Thus, it seems that the people who are taking this class want to be there: they are interested in the material and want to pursue the field. The audio and visual aspects of the room were highly regarded by the students. The biggest issue with the visual aspects of the room is the chalkboard, which has very bad glare so is hard to see no matter where the students are sitting.

People were mostly comfortable in terms of the space, temperature, air quality and proximity to other commonly used spaces. One said the instructor never changes the room, three rarely, six that the instructor doesn't need to, one frequently, and two always. This is a three hour lab, so the instructor often takes the students out of the room for part or all of the lab. This question may have misled the respondents, because "changing the room" could mean leaving the room or using it in a different way. The frequent trips out of the room might have influenced the responses. Five respondents rate the classroom as good and eight as an ideal room for the class. They all seem to be comfortable in the room; however, some issues need to be resolved.

All of the comments on the mood were fairly good. The respondents seem to have positive feelings about the space. They all seemed to be engaged in the class itself, and the TA was excited about the material, which helps the overall mood of everyone in the room. The most common suggestion was a whiteboard. I did not understand the need for this at first; however,

after sitting in on the class I noticed that glare makes it difficult to read the chalk from anywhere in the room. The other most common suggestion was for more natural light. People seemed to think that the room was stuffy and wish that there was some air circulation. There were few comments. Two of these were very positive, explaining this is one of the best classrooms they have experienced. No one gave any comments about other classrooms or general improvements that could be made.

There were four responses to the follow-up survey for the class I researched. Of the four surveys, three of the people thought the room was a great room and the fourth thought it was an okay room. They all rated the class at either a 4 or 5 on a scale of 1-5. Each of them thought that they would be getting grades in the A range or the B range. All four of them said that natural light is important to them. This classroom particularly has a lack of natural light. Three responded that they do not look at the classroom when they are choosing classes and the fourth that they did. Two of the students said that they study in the Davis Center.

# RECOMMENDATIONS

Our research found that University of Vermont students enrolled in College of Arts and Sciences and Rubenstein School of Environment and Natural Resources are generally content with their classroom spaces. Most students do not take into consideration classroom spaces when selecting courses. We found . Our broader recommendations **minor complaints about classrooms that could be remedied with routine maintenance: oiling chairs, making sure shades work correctly, and managing classroom temperatures** stem from our review of the literature on the relationship between classroom design, pedagogy, and student performance, as well as our observation of new active learning spaces on campus. Our observations suggest that students who have not been exposed to **new teaching approaches** such as flipped classrooms, active learning, and the use of “maker” labs may not have a foundation from which to make comparative judgements. With the introduction of active learning classrooms in the new STEM building, students will begin to have a basis for comparison, and we predict that students will desire more flexible classroom spaces for their humanities, arts, and social sciences courses in the future.

A recommendation that can be acted on immediately is to **create hybrid-style courses** that take advantage of as many of the features of Active Learning Classrooms as possible without modifying the physical classroom. Since Blackboard is already a standard feature of UVM courses, there would be no need, at first, to invest in a new online platform. Any course with lectures could benefit from flipping the classroom, at minimum. Further modifications should be based on the principles of social, active, contextual, engaging, and student-owned learning. Along with training instructors to incorporate engaged learning in their courses, we recommend **trainings in the relationships between spatial layout, engaged learning, and student outcomes**.

The next action that should be taken regarding the construction of classrooms is to **create a full ALC**, like the ones in the STEM complex, for the use of other fields. The most obvious benefit would be to create parity between the disciplines, but it may also be the case that humanities and social science instructors will discover new uses for the facilities that are not as applicable to STEM classes but represent improvements within their own fields. The existence of such practices, once known, would then provide further incentive to make more ALCs available.

In the longer term, it would be time consuming to convert all of the existing classrooms to ALCs. Rather than shutting down classrooms for the entirety of this upgrade process, it may be possible to **add some of the features of ALCs to classrooms in stages**. For example, it should be a very simple process to replace the tablet desks in classrooms with tables for small groups. Dividing lecture halls into classroom-sized spaces could be done before adding all the media features, and the spaces could be used for stopgap hybrid classes in the meantime.

Furthermore, these findings present several more suggestions for additional research. Once the STEM ALCs are running, studies should be done not only to quantify the difference in learning outcomes but also to **determine the qualitative differences in student experience between Active Learning Classrooms and their traditional counterparts**. Other aspects of the STEM building are unusual enough that they may also be worthy of additional study; for example, whether the glass walls result in a more airy-feeling environment or lead to a sense of

exposure. Studies comparing this space to others should keep in mind the principles of lighting, noise, temperature, footprint, furniture layout, accessibility of computers and media, and color.

Our study did not address in great detail the importance of social and green spaces on campuses, although their benefits are well-known. Therefore, additional studies should be conducted regarding the **effects of these informal meeting spaces on student and employee quality of life**. For example, it may be advantageous to create new solariums, such as in Aiken; or cafés attached to academic rather than student life buildings, such as in Waterman.

## Acknowledgements

We thank Vice Provost Brian Reed for serving as our service learning partner, and the Community-University Partnerships office for their support. We are grateful to Bob Vaughan, Michelle Smith, Jill Jemison, and Bill Jeffries for taking the time to meet with us as we conducted our research. Thanks also to the Economics Department for sharing your classroom space with us, and to the Geography Department for their on going support of service learning courses.

