Why Lecture Style Classrooms are Dominant in Classroom Design in Higher Education

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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#### Introduction

The traditional lecture-style classroom design in American colleges is failing students in ways that go beyond grades. Lecture halls or lecture-style classrooms are typically designed with students seated at separate desks in rows while the professor stands at the front to teach. This setup expects students to remain seated and listen uninterrupted for extended periods of time. This has led to a lack of physical and social engagement that has left students feeling fatigued and restless during class. Hosteng et al. (2019) conducted an extensive survey of students revealing a massive increase in their self-reported sleepiness and discomfort while sitting uninterrupted for seventy-five minutes or more during a lecture. Students struggle to stay engaged when they feel drowsy. To combat restlessness and boredom from prolonged sitting, many resort to playing games on their computers or working on assignments for other classes instead of paying attention. A survey of undergraduate students from 26 states found that undergraduates reported using their digital devices for non-classroom purposes on average 11.7 times a day (McCoy, 2015). This number has only increased recently as electronic devices have become more ingrained in our society and learning. I am currently in my last semester of undergraduate engineering coursework at the University of Virginia and it's not uncommon to look around during classes and see most of the students either playing games on their computers or completely asleep during lectures. Lecture-style classrooms have allowed for these problems to perpetuate.

The physical design of classrooms, including studios, laboratories, auditoriums, and other indoor environments, can have a profound impact on student learning (Lei, 2010). Yet instructors rarely change the way the classroom is designed or the way the students learn. The traditional lecture-style classroom design has essentially not changed in centuries and is based on the

educational space that first appeared in medieval universities. Since then classrooms have not changed except in their size (Park & Choi, 2014). So why has this design remained unchanged for so long, especially as modern technology has only amplified its flaws? This paper will utilize the Actor-Network Theory (ANT) to investigate which actors have allowed the network of the college classroom to remain unchanged for such a long period of time in America.

## Background

The way a classroom is designed is often a reflection of the philosophy of teaching and learning present during the time that it was created. The most common design, and the focus of this paper, is the lecture-style classroom, which includes both standard lecture halls and smaller classrooms arranged for instructor-led teaching. One of the educational philosophies this design represents is the philosophy of essentialism; characterized by a teacher-centered approach and a focus on core academic subjects. In essentialism, "Teachers are seen as knowledgeable guides who impart essential knowledge and skills to students" (Sparx Services, 2024, para. 3). In ancient Greece, the teaching style was largely rhetorical meaning that the teacher emphasized the use of debate and argumentation to have students think critically and logically. This was also shown in their classroom design with students and the teacher grouped together with no distinct classroom boundary allowing for more discussion among the class (Park & Choi, 2014). The medieval universities were the first to have a more structured classroom design through the first lecture halls. The purpose of these lectures was to deliver knowledge through the instructor's reading of original material to the students as books and paper were rare. During the Industrial Revolution, education transitioned from being primarily reserved for the elite to becoming more accessible to the masses. These expanded lecture halls are the groundwork for most large lecture halls found in American Universities today.

One might conclude that classroom design has changed over time in accordance with the evolution of educational philosophies and goals. This is partly true. There has been a recent shift in awareness of how classroom design affects learning and engagement with more focus on active learning classrooms. Active learning classrooms are spaces designed to maximize active, collaborative learning in contrast with traditional lecture-style classrooms (Yale Poorvu Center for Teaching and Learning, 2018). As shown in the figure below, they feature students sitting at round tables, moveable chairs, and multiple whiteboards or projectors across the room. Round tables encourage collaboration among students at the same table, while moveable chairs enable interaction between groups as students can move between tables easily. These classrooms help combat the lack of physical and collaborative engagement that lecture-style classrooms are missing. "In addition to engagement, participation, and learning, active learning also promotes increases in communication and interactivity, community and connectedness, satisfaction, and flexibility" (Allsop et al., 2020) However, most higher education classroom designs have remained unchanged, and traditional lecture-style classrooms are being built each year in American Universities. Many different educational philosophies have also endured throughout the 19th to 21st century, philosophies that differed from the disciplinary rank-and-file design that traditional lecture-style classrooms embody (Mäkitalo-Sieglso et al. 2010). For instance, progressivism, influenced by thinkers like John Dewey, emphasized experiential learning and the importance of student-centered, collaborative classrooms. Similarly, constructivist approaches encouraged learning through exploration and dialogue rather than passive listening. These philosophies promoted classroom designs that supported interaction, movement, and flexibility, features largely absent in lecture-style classrooms. So why have these traditional lecture-style classrooms not become obsolete with their problems and pushback for better designs?



Active Learning Classroom (Top) vs. Lecture Style Classroom (Bottom)

Actor-network theory (ANT) is a framework used to understand the relationship and influence that actors, humans, and nonhumans have on a network or technology. ANT suggests that anything in a network, whether it's a person, a machine, a book, or even an idea, can be seen as an "actor." These actors all interact with and influence each other in different ways. In this paper, the technology or network that is influenced by actors in the classroom. I will be gathering evidence from the University of Virginia as well as other American universities to explain how traditional lecture-style classrooms remain the norm in higher education in the United States.

#### Methods

To analyze how lecture-style classrooms have remained so persistent it is first necessary to gather evidence to demonstrate their continued dominance in the higher education space. To achieve this, I first mainly gathered evidence from my own university, the University of Virginia as well as some secondary evidence from other universities. I focused on UVa for this section because as a student I have direct access to almost all classrooms on UVa grounds. This allowed me to gather firsthand evidence rather than relying on potentially outdated classroom statistics from other universities to which I did not have access. UVa is a rigorous academic school, ranked 4th overall in the nation for public universities and 24th overall UVa Today (2024). By investigating a college that is very focused on its academic quality and prestige I can gain insight into the classroom design priorities of top institutions in the United States. I surveyed the newest UVa engineering building, Rice Hall, to categorize which active classrooms are traditional lecture style, active learning style, or some other classroom design. I also surveyed the newest academic building on campus, the new Data Science School, to determine what type of classrooms are being invested in at UVa. Determining what design category these classrooms fit into was relatively simple, as lecture-style classrooms are centered around the instructor with fixed, forward-facing seating, while active learning classrooms feature movable chairs, round tables, and multiple places for collaboration and instruction. Classrooms lacking both a central instructor focus and the defining features of active learning setups were categorized as "other."

I chose these buildings as the main focus; if UVa is still investing in traditional lecturestyle classrooms in their newest academic buildings it would provide strong evidence of the persistence of this design. This analysis will help determine whether universities are actively shifting toward alternative classroom models or reinforcing existing lecture-based structures.

To supplement this, I conducted document analysis using university documents and online databases to analyze classroom design trends at other universities. I focused on publicly available reports, and university statements regarding new academic buildings and design specifications to identify which actors most influence the classroom design choices of American universities. I selected the sources on availability of university documents that explicitly detailed classroom designs in new buildings or general design specifications. To ensure a rigorous and representative sample of the current classroom design trends, I selected sources from universities located in different regions of the United States that also had differing levels of academic prestige.

The collected evidence was analyzed through the lens of Actor-Network Theory, identifying key actors that have contributed to the persistence of lecture-style classrooms. By mapping the relationships between these actors, I investigated how lecture-style classrooms have maintained their dominance, despite the emergence of active learning classrooms.

### Results

Surveying both Rice Hall, UVa's newest engineering building, and the School of Data Science, Uva's newest academic building, revealed mixed and surprising results. As the hub of UVA's computer science department, Rice Hall was dominated by laboratory spaces rather than classrooms, highlighting its emphasis on research. In the whole six-story building there were only four active classrooms in total with three of them being lecture style and one being active learning. This finding was surprising. As an engineering student, I've taken several computer science courses, all of which required lab sections in addition to lecture. These labs were always held in another building on campus in the same room, which was used for active learning, with setups that encouraged collaboration. From my experience, computer science is an inherently

collaborative discipline; labs often involve group problem-solving, pair programming, and lots of peer interaction. Given this, it's striking that Rice Hall, the main building for the computer science department, contains only one active learning classroom. This suggests that, despite the collaborative nature of the subject, the building's instructional spaces still overwhelmingly support a lecture-style format. This disconnect illustrates how traditional classroom design continues to dominate, even in fields where active learning is not only beneficial but essential. Rice Hall is relatively new, having been constructed in 2011, it is not the newest academic building on campus (University of Virginia, 2025). Therefore, more investigation is needed to determine whether this building reflects outdated design priorities or a continued preference for lecture-based learning. To get a full picture of design trends, I turn to the evidence I gathered from the newest building on campus, the School of Data Science.

According to UVa Data Science (2025), the School of Data Science at UVa was a 120 million dollar project and its first new school constructed since 2007. Given its substantial budget, its status as the newest academic school, and its opening in 2024, the School of Data Science is expected to exemplify the university's highest standards for modern academics, including classroom design. As stated by UVa Data Science (2025) in reference to the classrooms in the new building, "Open, collaborative spaces will transcend traditional boundaries and spark interdisciplinary connections between learners, researchers, and innovators." A survey of the building confirmed this emphasis on collaboration, with half of the six classrooms designed as active learning spaces. However, traditional lecture-style classrooms were still present, comprising the remaining half. What's even more interesting is that the lecture-style classrooms only had, at most, a few more seats than the active learning classrooms, all of

which had identical seating capacities. A common justification for lecture-style classrooms is their ability to accommodate a larger number of students more efficiently than active learning spaces, but this was not the case in the School of Data Science. Despite its well-documented drawbacks, UVa is still constructing lecture-style classrooms in a building they themselves described as "collaborative" and "transcending"; qualities that lecture-style classrooms lack. Even the most rudimentary justification for lecture-style classrooms, the ability to accommodate more students, was not even a proper justification for the construction of these three classrooms in this building.

One may argue that since 50% of the classrooms in the new School of Data Science are active learning, lecture-style classrooms are clearly not still the dominant classroom design. I would respond with the fact that this argument is ignoring the broader context. When examining both Rice Hall and the new Data Science building, traditional lecture-style classrooms are still being actively constructed, even in environments explicitly designed to foster collaboration. The School of Data Science was promoted as a space to "transcend traditional boundaries," yet half of its classrooms still reinforce those very boundaries. The continued incorporation of lecture-style classroom design remains deeply embedded in university infrastructure and decision-making, even despite increased awareness of the benefits of active learning.

What are the actors influencing this continued dominance of lecture-style classrooms in higher education in America? Examining public university documents from different universities across the country revealed the main actors influencing the network of the classroom. I will reference specifics from documents from the universities of Connecticut, Pittsburg, and Florida State as well as reference general trends I found when inspecting other documents.

The University Of Connecticut's Classroom Design Guidelines reveals many actors influencing the design of classrooms at UConn, stating that the design guidelines were developed by a team that included, "campus planners, architects, UITS, audio-visual expert, Registrar Office representatives, Institute for Teaching and Learning staff, Facilities and Operations engineers, Disability, Procurement, EHS, and Fire Marshalls staff" (University of Connecticut 2015). The Registrar's Office is especially important in shaping classroom design at UConn through its responsibility for space utilization. "The University has a set of policies and standards for measuring classroom utilization," including square footage per student (University of Connecticut, 2015). These utilization standards promote efficiency, favoring room layouts like lecture halls that can fit the highest number of students into the smallest amount of space which active learning classrooms do not prioritize. Using Actor-Network Theory, this makes the Registrar and its associated class scheduling software a central actor in the network that sustains lecture-style dominance. Although it wasn't intentional, scheduling optimization resists more flexible layouts. This same document also revealed some non-human actors that promote the continuance of lecture-style classrooms in the classroom design network. At Uconn, lecture halls are defined as having either fixed seating or theater-style configurations (University of Connecticut, 2015). Once fixed seating or a theater-style configuration is installed, the room cannot easily be reconfigured, physically locking in that classroom to be lecture-style until the university decides to renovate the space. These actors are not unique to UConn, many other universities' classroom design guidelines reference physical infrastructure such as seating and trying to be efficient in classroom utilization as being influential on what classrooms are built and used.

Another actor that these documents often reference are external building codes. The University of Pittsburgh Classroom design standards reference adherence to these local building codes, "These guidelines... must be adapted to fit the local needs, mission, and individual preferences of each institution as well as conform to applicable state and local codes." (University of Pittsburgh, n.d.) Facilities planners and architects often are seen as working alone in designing academic buildings on campuses; however, they work within a network shaped by external building codes which are drafted by local government. This means that indirectly state and city legislative officials are influencing what classroom designs persist at universities in their respective areas. The Florida State University General Classroom Design guidelines also repeatedly reference compliance with building codes. For example, classrooms serving more than 100 students must include accessible seating "as required per code," with oversight from the FSU Building Code Official (Florida State University, n.d) These codes inherently constrain design flexibility, the interaction between these codes and trying to optimize classroom utilization almost always results in facilities planners opting for the more traditional classroom design, lecture-style classrooms in their respective universities. Budget constraints were often referenced as well, "The standards are customized to fit the needs of the major department(s) in the building to the extent possible within budget limitations" (University of Washington, St. Louis n.d). Budgets constrain what universities can build in their academic buildings, acting as another significant actor in the classroom design network. This actor often leads to the maintenance of traditional lecture-style classrooms on campuses due to the cost-effectiveness and practicality of not redesigning already built classrooms.

Overall, a variety of actors are influencing each other and American Universities to keep existing lecture-style classrooms and construct ones in new academic buildings. The main actors

I identified surveying university literature include: facility planners, local and state government, budgets, existing infrastructure, building codes, and scheduling systems. This list is not a comprehensive one, there are many smaller actors influencing classroom design, however, this list contains major actors that are found at every university in America. Looking through the lens of Actor Network Theory, we can tell that each of these actors does not act in isolation, but instead within a tightly woven network. Facilities planners do not make decisions independently; they are bound by building codes established by state and local governments, budget limitations set by university administrators, and classroom utilization requirements that are dictated by Registrar offices. These constraints often push them toward lecture-style designs, which are cheaper, more space-efficient, and easier to approve. Budgets influence the kinds of physical infrastructure that can be installed, often favoring fixed seating and standard audio and visual setups, such as one projector and screen at the center of the classroom, because they are less expensive and easier to maintain when compared to active learning classrooms which have multiple screens and projectors. Budgets also influence facility planners against remodels of old lectures because of how expensive it is. Building codes requirements further narrow what kinds of classroom layouts are viable, often making large, tiered lecture halls the most "compliant" option. Scheduling systems, aiming to optimize efficiency and fit large student populations, reinforce this by prioritizing rooms that meet specific occupancy targets, a metric that lecture halls excel at meeting. Actor-Network Theory illustrates that each of these actors, budgets, policies, infrastructure, codes, and human decision-makers, mutually reinforce one another, coproducing and stabilizing the continued dominance of lecture-style classrooms across American higher education.

#### Conclusion

In American universities, lecture-style classrooms dominate the classroom design space, even when better designs have been found, especially the particularly popular active learning design. This is due to a tightly interconnected network of human and non-human actors, each influencing one another in ways that reinforce lecture-style classroom design. By applying Actor-Network Theory to a variety of university documents and direct observations I made at UVa, it becomes clear that this persistence is not the result of one decision-maker but the outcome of a systemic network where each actor supports and sustains the others. Future research could build on this foundation by analyzing how efforts to introduce active learning environments interact with this existing network; whether those efforts could ultimately reshape it, could be absorbed into it, or could fail to challenge it at all.

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