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Inclusive Design Studios: Rethinking the Instructor's Role

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Abstract

Despite recent efforts, the culture of the architectural design studio continues, in large part, to be based on centuries-old traditions. Research on teaching, learning and bias suggest, however, that a rethinking of these traditions is long overdue if we aim to create inclusive learning environments and diversify our profession. Drawing on three recent research compendiums - on the cultivation of expertise, *Peak: Secrets from the New Science of Expertise* (Ericsson and Pool, 2016); on student motivation, *How Learning Works: Seven Research-Based Principles for Smart Teaching,* (Ambrose et al., 2010) and on stereotype threat, *Whistling Vivaldi And Other Clues to How Stereotypes Affect Us and What We Can Do* (Steele, 2011) - this translational project considers how this research might suggest a rethinking of design studio instruction. Ericsson and Pool's synthesis of decades of research on the development of expertise suggests a critical re-imagining of the instructor's role in design studios. Ambrose et al.'s compendium of research on learning suggests that many architectural education traditions inevitably leave students unmotivated and need to be reconsidered. Finally, Steele's survey of research on the ways in which stereotypes impact academic performance illuminate some of the roadblocks to diversifying our classrooms and profession. This essay shares evidence-based strategies to develop a more inclusive and effective design studio culture.

Keywords: Pedagogy, design studio, inclusion, bias, stereotype threat.

1. INTRODUCTION

Over the past three decades, scholars have repeatedly identified the exclusionary culture of design studios as an impediment to diversifying the profession. Architecture faculty, who rarely have any formal training as educators, have often responded by using a trial-and-error method; they hypothesize and experiment in their studios with good intentions and often productive outcomes. As a result, while the body of research on design studio pedagogy has grown in recent years, much of the existing scholarship is drawn from case studies (Brody et al., 2017; Criss, 2018; Galil and Kandil, 2015; Masdéu and Fuses, 2017; McLaughlan and Chatterjee, 2020; Pruitt and Kratzer, 2018; van Diggelen et al., 2021). This paper employs an alternative approach to complement these case studies. A translational research approach that draws on decades of scholarship in education and social psychology has the potential to expand our understanding of best practices beyond the case study method.

This project considers the question: how we can re-imagine the design studio to be an inclusive learning environment by drawing not on tradition or case studies, but rather on research on learning and teaching? Building on recent research from social psychology and education on the cultivation of

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expertise, student motivation, and stereotype threat, this essay considers the role of the design studio instructor in creating an inclusive learning environment. Our goal here is to undermine and debunk any lingering sense that it is acceptable to exclusively teach the way we were taught. Instead, we introduce design educators to recent studies synthesizing decades of research on learning, expertise and stereotypes with particular relevance to the aim of creating inclusive learning environments in design studios.

We begin with Anders Ericsson and Robert Pool's research on the cultivation of expertise, which upends the popular belief that people are innately good or bad at things like music, math, or art (Ericsson and Pool 2016). As they document, most people can cultivate expertise in almost any area or skill through what they call *deliberate practice*. The recognition that expertise in design is something to be developed rather than something one is born with shifts the role and responsibilities of the design studio instructor. If anyone can learn design skills, studio faculty can no longer position themselves as talent scouts responsible for identifying those with the potential to become award-winning designers and chasing off the rest. Instead, they have a responsibility for helping each student develop their potential and cultivate expertise through their practice.

Second, we consider research on what motivates students to learn. As Anthony documented, some architecture faculty believe fear of public criticism and shaming motivates students. Yet Ambrose et al.'s summary of research on learning and teaching, *How Learning Works,* suggests three factors are critical determinants of student motivation: supportive learning environments, student efficacy, and student perceptions of the value of assignments (Ambrose et al. 2010). In the context of growing mistrust of authority among the generations of students entering our classrooms, motivation is becoming more complex. The tactics and fears that motivated Generation X students, born between 1965 and 1980, many of whom are now faculty, often backfire with Generation Z and millennials, leaving students resistant and demoralized. Ambrose et al.'s research on what actually motivates students today prompts a careful reconsideration of studio teaching strategies, design reviews, assignment briefs and assessments, and studio culture.

Finally, Claude Steele's research on stereotype threat demonstrates that the messages conveyed by faculty affect student performance in different ways depending on pre-existing stereotypes. As Steele documents, for example, a reminder of the stereotype that girls are bad at math before a math exam causes girls to underperform relative to their abilities (Steele 2010). Given the stereotypes about architects—that they are older white men dressed in black, for example—we might expect that most of our students suffer at one time or another from anxieties induced by negative stereotypes relative to their identities. Steele offers concrete strategies for how educators can work to create inclusive learning environments despite the stereotypes and realities that still plague the profession of architecture.

RESEARCH ON THE DEVELOPMENT OF EXPERTISE

"I was basically, in a very unprofessional way told that I was stupid and in the wrong field" is how one architecture student described a design jury experience (Anthony 2012, p. 34). This student's experience is hardly a singular one. Indeed, there is a long tradition in architecture schools of the faculty viewing themselves as talent scouts, responsible for identifying students with potential and scaring off those who lack talent. Recent research on how we develop expertise offers a direct challenge to this tradition, however, by indicating that expertise is rarely natural or innate but rather is something that can be developed. What separates those who ultimately develop expertise from those who plateau, or fail is their manner of practice. *Peak: Secrets from the New Science of Expertise* summarizes decades of social science research by Anders Ericsson and others to answer the question of how we develop expertise in different areas (Ericsson and Pool 2016). Ericsson and other researchers have studied those who have developed expertise as world class chess players, radiologists, musicians, athletes and even comedians. Through decades of studies, Ericsson found that there were elements of practice that were common to those who succeeded whether they were learning to drive a car, play tennis or flute, or do oral surgery.

These decades of studies show that even perfect pitch, a musical talent long believed to be innate, is developed at a young age through "deliberate practice." For centuries, perfect pitch—the ability to identify any note immediately on hearing it—was something you were believed to be born with. Citing great musicians and composers like Mozart, who developed perfect pitch at a young age, nature was given the credit for this skill. Recent experiments, however, have demonstrated that perfect pitch can be learned.

In a 2014 experiment with 24 children aged 2 to 6, for example, a psychologist organized a perfect pitch training program. While some children took longer than others to complete the program, by the end 100% of the children developed perfect pitch. As Ericsson and Pool explain the significance of the study, "perfect pitch, far from being a gift bestowed upon a lucky few, is an ability that pretty much anyone can develop with the right exposure and training" (Ericsson and Pool 2016, p. xiv). In this context, it is not surprising to learn that Mozart's father was a musician as well; he began his musical training at a young age under his father's guidance. Mozart's special talent was one we all have: the capacity for deliberate practice. Ericsson and Pool describe this gift, which every expert they studied has: "they were all endowed with a brain so flexible and adaptable that it could, with the right sort of training develop a capacity that seems quite magical to those of us who do not possess it" (2016, p. xvi).

This research underscores just how wrongheaded the idea of a design studio instructor as a talent scout is. If a psychologist can teach 100% of children to develop perfect pitch, then studio instructors should be able to teach architecture students to capably draw, model, compose, visualize, and even integrate building systems through focused practice. Every student has the innate capacity to learn these skills, though some may come into our classrooms with more practice already completed. Beginning design studio instructors seeking to identify those with talent may simply be identifying those who had more art classes or greater exposer to architects and architecture prior to college. Worse yet, they may be identifying those students who most closely resemble their preconceived ideas about who is and is not a designer. In doing so they are not separating those with the capacity to be designers from those who lack it; rather they are acting on their own biases or privileging those who took more art classes in high school. In doing so, they are failing as teachers to develop a learning environment that recognizes every student's capacity to learn.

The idea that design studio instructors are talent scouts is a particularly dangerous proposition in the early years of an architecture curriculum, because what determines success early on is not the same as what ultimately determines success in one's career as an architect. Prior experience in art or architecture courses plays a larger role in perceived success in beginning design than in the later years, or importantly in professional successes. Research suggests that what we call work-ethic and what scientists would characterize as the quantity and quality of practice are more important long-term determinants of success than IQ and/or prior knowledge. How IQ and practice intersect in the development of expertise is illustrated by two studies of chess players that considered their intelligence and the amount of time spent practicing (Ericsson and Pool 2016, p. 229). In the first study, researchers examined the practice records and IQ tests of 57 young chess players. Researchers found the most important determinant of success was the amount of time spent practicing; IQ played a secondary role among these players. And in a study of only elite young chess players, only the best of the best, IQ played no role in determining success among the group. It was the chess players who practiced the most who became the most successful. Interestingly, among this group, a higher IQ became a slight disadvantage because "the elite players with lower IQs tended to practice more, which improved their chess game to the point that they played better than the high-IQ elite players." (Ericsson and Pool 2016, p. 231). These studies suggest that predictors of success are not always well-correlated to IQ, but are instead often determined by the quality and quantity of practice. As Ericsson and Pool explain:

> In the long run it is the ones who practice more who prevail, not the ones who had some initial advantage in intelligence or some other talent…The results from the chess study provide a crucial insight into the interplay between 'talent' and practice in the development of various skills. While people with certain innate characteristics—IQ, in the case of the chess study—may have an advantage when first learning a skill, that advantage gets smaller over time, and eventually the amount and the quality of practice take on a much larger role in determining how skilled a person becomes. (2016, p. 233).

This research highlights the fact that those who struggle—those who initially have to work twice as hard to master certain skills—may in the end be successful because of the practice habits they develop in the process. Those who find that skills come easily to them initially may be less likely to develop the practice habits necessary to excel in the end. In the context of the early years of an architecture curriculum, the quality and quantity of practice may outweigh the

impact of IQ on long-term success. For architecture, this research is democratizing; it suggests that every student has the capacity to succeed as a designer and that success lies not in the hands of the instructor but is rather determined by the practice of the student.

Knowing that every student has the capacity to succeed, but that their success will be determined by the quality and quantity of their practice, the role of the studio instructor shifts considerably. Rather than being a judge, instructors must become coaches and mentors responsible for designing and explaining a series of practice exercises, meet students where they are, and scaffold their learning.[1] Design studio case studies support this conclusion: van Diggelen et al., for example, found that good coaching is goal-directed, safe and stimulating, and process-oriented rather than product-oriented (van Diggelen et al. 2019). Adams et al.'s cross-disciplinary analysis of coaching during design reviews emphasized the importance of scaffolding to student learning, reinforcing one of Ericsson and Pool's recommendations to break complex skills down into small tasks (Adams et al., 2016b).[2] A case study from Thomas Jefferson University suggests that instructors must be cognizant of how they adapt to best facilitate learning for both extroverts and introverts in the studio context (Pruitt and Krazer, 2018).

DELIBERATE PRACTICE

Ericsson and Pool identify five elements of deliberate practice that are common across realms of expertise (2016). Many of these will be familiar to anyone who has sought to develop expertise playing trumpet, field hockey, or in design school. They include identifying well-defined goals, breaking complex elements of expertise down into sequential, bite-sized pieces, being focused, receiving quality feedback, and getting out of one's comfort zone (see Table 1).

Experienced educators will recognize the five elements of deliberate practice. In the context of an architecture curriculum, making the elements of deliberate practice explicit rather than implicit can help students to be more cognizant of their own role in their success. Being clear about how the quantity and quality of practice contributes to success can help boost the confidence of students who arrive in our classrooms with a love of design and building but without high school architecture courses or the highest test scores. This way, any student may be empowered. And this is what is most revolutionary about research on expertise; it demonstrates that all students have the potential to become great architects. Their success will be largely determined by their actions, not our judgements. How students practice, how often and how well, and whether they push themselves out of their comfort zones will determine who succeeds. This realization places a tremendous amount of responsibility on the student. It is not simply that they need to put in hours, but more importantly that they need to turn off their phones, focus, take feedback with an open mind, and embrace new challenges. The instructor does, however, still have a critical role to play in determining the path to success for students; they bear the responsibility for creating a learning environment in which students are motivated to succeed. Active learning practices can help instructors intentionally shift responsibility for learning to students. Here, recent research on student motivation illuminates where the traditions of architecture school culture may have room to improve.

KEY FACTORS IN STUDENT MOTIVATION

What motivates students to learn? As we imagine the role of a design studio instructor shifting from a talent scout to a coach supporting every student, and the responsibility for success shifting from instructor to student, this question becomes critical. As instructors, we can provide well-defined specific goals, quality

[1] In instructional literature, scaffolding is comprised of three key characteristics: a *collaborative context* between the teacher and student; an understanding of the student's current knowledge (their *zone of proximal development*), with instruction being tailored to stretch their knowledge just beyond their current zone; and *gradual withdrawal of support*, where the student takes on increasing responsibility. Overall, the aim of scaffolding is for the student to gradually gain independence (Beed et al. 1991, emphasis from the original).

[2] For more on how design reviews engage design knowing, being and coaching, see the special issue of *Design Studies* dedicated to this topic: Adams, Robin S., Monica Cardella, and Şenay Purzer. 2016. "Special Issue: Design Review Conversations." *Design Studies*. 45.

Table 1. The five elements of deliberate practice (Adapted from Ericcson and Pool, 2016)

1. **Well-defined specific goals.** Deliberate practice involves working towards clearly-articulated goals rather than just randomly practicing. In music, for example, this may entail practicing a piece of music carefully selected to be at the right skill level.

2. **Breaking complex elements of expertise down into "baby steps."** To develop expertise, you cannot aim to tackle every element at once. In design studios, for example, we do not assign first year students a project designing a complex building with systems integrated. Instead, deliberate practice entails breaking complex tasks down into manageable parts. Students might first learn to draw a plan, then learn to draw a perspective, then learn to build a model, etc. In music students might first learn scales and to read music before progressing. In tennis, students might spend time focused just on their backhand.

3. **Being focused.** Deliberate practice is focused practice. Our full attention must be concentrated on our practice to develop. Not only is it difficult to progressively develop a skill through unfocused practice such as watching TV while practicing piano, but it can also be detrimental. If, for example, we learn to play a piece of music incorrectly due to unfocused practice, we have to unlearn and relearn the correct way to play it.

4. **Quality feedback.** Whatever skill we are learning, feedback is necessary to develop expertise. A coach, teacher or mentor can identify which aspects of our practice are working and where further practice is needed.

5. **Getting out of your comfort zone.** To develop expertise in an area you must take on increasingly difficult challenges. Once you develop a basic level of mastery you will cease to improve unless you continue to push yourself out of your comfort zone. In music, this typically entails playing progressively more difficult pieces of music so as not to plateau. In architecture, this entails tackling progressively more complex design challenges such as more complex sites, building programs, or systems integration.

feedback, and help break complex tasks down into manageable assignments. But ultimately it is the student's responsibility to engage in quality practice, and to do that, students must be motivated to learn. Yet, as Anthony's research demonstrated, the culture of architecture schools can often leave students feeling demoralized and unmotivated (Anthony 2012). Research on teaching and learning helps shed light on why some of the traditional practices in architecture classrooms may leave students unmotivated and how we can retool our approach to improve motivation.

In *How Learning Works: 7 Research-Based Principles for Smart Teaching,* Ambrose et al. (2010) synthesizes decades of recent research on student motivation. As they explain, students may arrive in our classrooms with a range of motivations for being there and doing the work of learning. They may, for example, be motivated by the long-term goal of getting a high paying job, family pressures, or by the sheer satisfaction of mastering a skill. Many of these external or personal factors lie outside the realm of the instructor's influence. But there are three key elements that drive student motivation which instructors do help shape: the perceived value of the assignment or work, the student's confidence in their ability to do the work (efficacy), and the quality of the learning environment (supportive or unsupportive). As Fig. 1 illustrates, when value, efficacy and learning environment quality are aligned positively, instructors can expect students to be motivated. As educators, our influence in inspiring student motivation is shaped by creating meaningful assignments, ensuring assignments are carefully tailored to student abilities, and creating a supportive classroom environm ent through our actions and words. In the context of design studios, there are particular challenges when putting this into practice.

Student motivation and value

Student perceptions of the value of coursework and learning activities play a critical role in shaping student motivation. As Ambrose et al. explain, "if students do not find the content of the course interesting or relevant, they may see little or no value in mastering it and may fail to engage in the behaviors required for deep learning" (2010, p. 16). Ambrose et al. recommend six strategies for establishing the value of assignments (Table 2). It is easy to imagine ways to incorporate each of these strategies into design

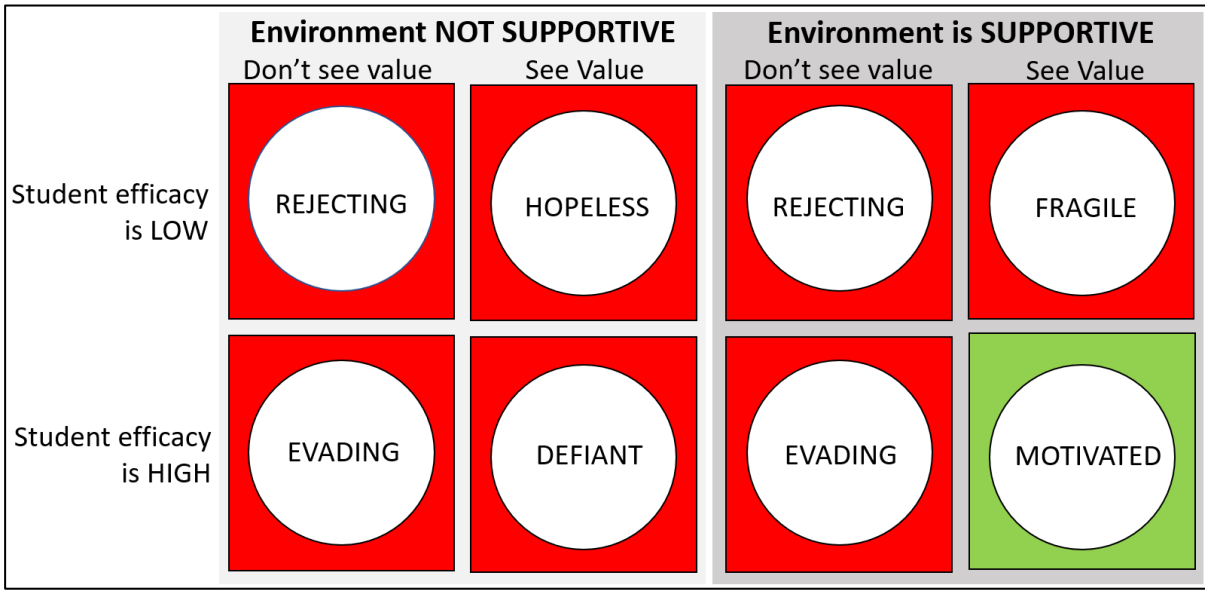

Figure 1. The effects of student efficacy and educational environment on student motivation. Adapted from *How Learning Works: 7 Research-Based Principles for Smart Teaching,* Ambrose et al. (2010), p. 80.

studios. Studio projects can be crafted to connect to student interests and often "provide authentic, real-world tasks" by engaging communities and clients (Ambrose et al. 2010, p. 83-84). For example, Shannon Criss's case study of a studio in which a participatory design process was employed built student confidence and motivation through engagement with community members (Criss, 2018). Peer-to-peer mentors and professional mentors can help demonstrate the relevance of studio work to current academic and future professional lives. Clear assignments and rubrics communicate expectations and help reward what is valued. Finally, instructors can share their love of the discipline in everyday interactions with students. McLaughlan and Chatterjee's case study of Australian design studios reinforces these conclusions; they found that clear and high expectations coupled with a strong peer culture support student motivation (McLaughlan and Chatterjee, 2020). [3]

Despite the disarming simplicity of these strategies, however, communicating the value of studio coursework is a challenge especially in the early years of the curriculum. To develop expertise in design requires hours of practice work that may seem disconnected from larger goals. In architecture studios, particularly beginning design studios, students must develop foundational skills such as modeling, sketching, composition, and software skills, before ever designing a building. Linked to perceptions of value is a student's trust in their instructor, which reflects their trust in authority. Students who do not trust an instructor will be less motivated to undertake assignments that seem like busy work and assignments for which the purpose is unclear. Recent generational shifts have altered trust levels in authority and, consequently, lowered the level of trust we can expect from today's students at the start of each semester.

The students in our classrooms today do not trust authority as older generations once did. In fact, the lack of trust in authority is a defining feature for millennials, born between 1981 and 1997, and Generation Z, born between 1997 and 2012 (Cillizza 2015). These generations of students matured as teenagers and

[3] Architecture studio instruction may also benefit from integrating Mihaly Csikszentmihalyi's extensive research on cultivating creativity into the curriculum. Csikszentmihalyi (1996), who coined the psychological concept of "flow," argued that an optimal and enjoyable creative problem-solving process is challenging, includes working toward goals, and involves feedback on how well one is performing. Introducing challenges with clear goals and feedback may help improve not only motivation, but also creative outcomes, among students.

Table 2. Six strategies for establishing the value of assignments (Ambrose et al. 2010, p. 83-85)

1. Connect the material to student interests
2. Provide authentic, real-world tasks
3. Show relevance to students' current academic lives
4. Demonstrate the relevance of higher-level skills to students' future professional lives
5. Identify and reward what you value
6. Show your own passion and enthusiasm for the discipline

young adults amidst the 2008 economic crash caused by the mortgage lending crisis. At a young age, many of these students witnessed families and friends lose homes and jobs. The political turmoil, the rise of misinformation, and a global pandemic have only intensified our students' mistrust of authority. A recent poll of Generation Z, for example, found that just 7% trust the U.S. Congress (Adamczyk 2019).

Given the lack of trust in authority among the students entering our classrooms, we cannot expect them to willingly take part in rote or opaque exercises without a clear understanding of the value of the assignments relative to their long-term goals. We cannot ask them to craft a meticulous section drawing of a watermelon and expect them to simply trust us when we say it is critical to becoming an architect. The burden is on us to communicate the value of the work. Faculty credentials, titles, advanced age, awards, and publications no longer automatically confer authority on the instructor or instill trust in the student.

This lack of trust in authority among our students makes communicating the purpose of the work we ask them to do all the more important if we want them to be motivated. Yet in architecture studios, the purpose of assignments and projects is often shrouded in mystery or described in ways that are so opaque as to be illegible. A cursory look at academic papers in which faculty describe assignments used in beginning design studios usually turns up some combination of the following words: topology, disembodied, hybrid, tectonic, optimization, embedding, simulation, simulacra, workflows, disturbances, flaneur, gestalt, artifact, apparatus, and abstraction. Often beginning design assignments are naïve experiments based on personal interest of the instructor and written for an audience of other architecture faculty rather than the students in our classrooms (Brody et al. 2019).

For those students who arrive in our classrooms and studios eager to engage communities in need or address climate change, the opaque and exclusive language of studio assignments from their titles to their confusing descriptions undermine learning goals by obscuring the value of the work. Instead, these types of assignments seek to create a sense of exclusivity; anyone who questions their meaning clearly doesn't "get it" and, thus, doesn't belong. These deliberately confusing assignments and the culture they create recalls the story of the Emperor's New Clothes; rarely is anyone brave enough to observe and speak the truth, for doing so would result in community expulsion. Rather than clearly communicating the value of the work undertaken in beginning design studios, our academic culture often aspires to do just the opposite; we obscure, overcomplicate, and distort foundational skill-building exercises to make their purpose and meaning unclear. Yet, if we are to be serious about creating inclusive design studios, we must develop curricula and assignments in which the value and purpose of assignments is clearly communicated and explicitly linked to students' goals and course learning objectives. This is not to suggest that we cannot have complex or abstract learning objectives in beginning design studio curricula; only that these goals must be clearly communicated in an accessible way tailored to our audience of students. Drawing a meticulous section of a watermelon may be a worthwhile assignment so long as the instructor is able to clearly connect the value of the work to the long-term learning goals of their students.

Efficacy

The second key factor in student motivation is efficacy or a student's belief in their ability to complete the work and get the desired outcome. As Ambrose et al. explain, "in order to hold a positive expectancy for success, a student must not only believe that doing the assigned work can earn a passing grade, she must also believe that she is capable of doing the work necessary to earn a passing grade" (2010, p. 77). For architectural curricula, an understanding of efficacy often drives scaffolding of learning objectives and projects over a multi-year period. Design studio projects, for example, typically progress from small and simple programs to increasingly more complex sites and programs at a larger scale. Such scaffolding helps to ensure that projects are tailored to meet the students where they are. In contrast, assigning overly complex and/or incomprehensible exercises may cause students to feel hopeless rather than motivated. One student reflected on their experience, writing: "I'm in second year of architecture. … Still, even though I should be grateful I'm in a good place and I do well on projects, it's a lot of stress. I cry and have panic attacks - and they're not fun" (Reddit, n.d.). Take, for example, the student who, after staying up until 3:00 a.m. multiple nights to finish his project recalled the feedback from the design jury: "The professors didn't like any of the projects in the class! Then whose fault is it if no project is up to their standards? Something must be wrong with the instruction! I feel disgusted!" (Anthony 2012, p. 37). Understandably, this student might feel hopeless or rejected rather than motivated in such a learning environment. To help improve student efficacy, Ambrose et al. share eight strategies (Table 3).

Even with careful scaffolding in architectural curricula, students often struggle to envision a path to success when confronted with a new project. To counter this, experiencing previous successes in similar types of assignments can help build student confidence. As Ambrose et al. explain:

> if a student attributes the good grade she received on a design project to her own creativity (ability) or the many long hours she spent on its planning and execution (effort), she is likely to expect success on future design assignments. This is because she has attributed her success to relatively stable and controllable features about herself. These same features form the basis for positive expectations for similar situations in the future. (2010, p. 78).

Instructors can help students imagine and believe in their potential for success by showing examples of previous student work. Seeing that students with similar abilities and experience were able to complete the assigned projects successfully helps develop student efficacy. Examples of good work also help illustrate the instructor's expectations. Rubrics that explicate how the work will be evaluated help students focus their attention on aspects of a project that matter most and build efficacy by removing that mystery. Providing an assignment early in the semester that gives every student a chance for an early win—an early success—can help develop our students' confidence in their ability to succeed in a course. Finally, Ambrose et al. caution instructors to be fair, provide targeted feedback and carefully educate students about success and failure.

Learning environment

Whether a learning environment is perceived as supportive or unsupportive is the third factor that influences student motivation. Instructors and students both play a role in creating supportive learning environments, particularly in courses where students interact with one another a great deal, such as discussion-based seminars and design studios. As Ambrose et al. describe the influence of the learning environment (2010, p. 79):

> If students perceive the environment as supportive (for example, 'The instructor is approachable and several of my classmates seem willing to help me if I run into trouble'), motivation is likely to be enhanced. If students perceive the environment as unsupportive (for example, 'This instructor seems hostile to women in engineering'), it can threaten expectations for success and erode motivation.

Many of the traditions of architectural school culture foster an unsupportive learning environment. A 2018 architecture student survey described an instructor who suggested a student better manage their workload by "sleeping less" and summarized, "Unhealthy by nature, the culture encourages bad habits and toxic expectations from students, tutors, and practices alike" (Dobbins 2018). The words and actions of

Table 3. Eight strategies to address student efficacy (Ambrose et al. 2010, p. 87-88)

1. Create assignments that provide the appropriate level of challenge
2. Provide early success opportunities (stereotype threat)
3. Articulate your expectations (stereotype threat)
4. Provide rubrics
5. Provide targeted feedback
6. Be fair
7. Educate students about the ways we explain success and failure
8. Describe effective study strategies

instructors have a tremendous influence on the nature of the learning environment and often have long-term effects on students' choices and career paths. Award-winning designer Ronette J. King recounted the influence of two instructors (Anthony 2012, p. 200-201):

> I had a teacher who was a Bauhaus student. She was extremely tough, and everyone in school knew it. That same instructor also said in class once, in front of everyone, that I would never be a good designer because I knew how to draw and I would always use that as a crutch. I was so devastated by her comment…. A different teacher later recognized the fact that I had grasped basic ideas of concept planning. He encouraged me by giving me a good grade and telling me that I did a good job. It was wonderful. I can remember that day so clearly. My attitude about my skills did a 180-degree turn. He neutralized my previous teacher's negativity.

King's recollections highlight the lasting effects one positive or negative interaction with an instructor can have in terms of student motivation. The power of instructor's words on student performance is further highlighted by studies on stereotype threat.

BIAS AND STEREOTYPE THREAT IN LEARNING ENVIRONMENTS

Scholarship on the ways in which our identities—as men, women, old, young, short, tall, Black, white—intersect with stereotypes about those identities demonstrates that our behavior and performance can be deeply affected by reminders of those stereotypes. Claude Steele recounts one example: when white college students were told that a round of mini golf was designed to test their natural athletic ability, they underperformed relative to their ability. The stereotype that white people are not naturally athletic influenced their performance without them even realizing it. The reasons these groups underperformed stems from the reality that we are all aware of the stereotypes that follow or precede us wherever we go. Whether we are male or female, young or old, tall, or short, Black or white, we are well aware of the stereotypes about our identities. Awareness of these stereotypes and our fear that our actions may confirm negative stereotypes creates anxiety, often subconsciously, and undermines our performance (Steele 2010).

Claude Steele has described the ways in which our awareness of and anxieties about stereotypes connect to our identities, in turn influencing our performance, as the "stereotype threat," which he characterizes as "the effect of stigma pressure on intellectual functioning" (Steele 2010, p. 66). As he explains:

> despite the strong sense we have of ourselves as autonomous individuals, evidence consistently shows that contingencies tied to our social identities do make a difference in shaping our lives, from the ways we perform in certain situations and the careers we choose to the level of pressure we feel in important situations and whom we choose as friends (Steele 2010, p. 14).

In the context of architecture, the stereotypes are well known; architects in films and novels are almost always ego-centric, elite white men from upper class backgrounds.[4] Furthermore, recent scholarship has highlighted intersections between the white elite nature of architectural education and racism (see, for example, Choi 2020). At the University of Oklahoma, one design student responded to a 2020 survey, writing, "...as one your few Black students, it seemed as if the courses were taught with the preconceived notion of what a contemporary designer is" (Gibbs College 2020). The reality is, however, that the demographics of the profession do not match the demographics of our communities. For example, as of 2020, only 17% of licensed architects in the U.S. were women (AIA 2020), while fewer than ten percent of licensed architects in the US are Hispanic or Latino (Nicholson 2020b). For Black men, who currently make up less than two percent of licensed architects in the US, but nearly a third of the sentenced prison population, cultural stereotypes pose a real threat to their sense of belonging in architecture school (Nicholson 2020a). Despite the reality of stereotype threat, research suggests that design studio instructors can provide a means to help support student identities. Galil and Kandil's case study research in Egyptian design studios, for example, illustrated how studio projects can help students develop a sense of identity by fostering a connection to place (Galil and Kandil, 2015).

Stereotypes about who is typically an architect and who is not nevertheless serve as a constant source of anxiety that distract our subconscious minds from the tasks at hand. Masdéu and Fuses describe the negative impacts of traditional studio hierarchies, students "lose confidence in their thoughts and language, making them defensively silent in the presence of a teacher who apparently has the answers worked out already." (Masdéu and Fuses, 2017). As Steele explains, "Identity threat isn't a passing threat that happens just on tests. It's a cloaking threat that feeds on all kinds of daily frustrations and contextual cues and gets more disruptive over time" (Steele 2010, p. 179). Given the cultural stereotypes and persistent realities about who architects are and are not in our society, we might expect that nearly every student in our classrooms may be negatively influenced by some kind of stereotype threat at some point. Women, students of color, first generation college students, and those from working class backgrounds may all, for example, face anxieties due to stereotypes about architects and their own identities. Take, for example, the female student who recounted of their design jury feedback, "I was told that I would be better off 'selling dresses.' (Yes, I am a female)" (Anthony 2012, p. 37). In this case, the demeaning action of a juror reinforces stereotypes about who belongs in architecture and necessitates energy to overcome. The mental energy spent trying to resist conforming to negative stereotypes and worrying about them undermines students' academic performance. Studies consistently show that students encountering stereotype threats underperform relative to their abilities; Steele notes, "identity threat is a poignant cause of minority underachievement in American higher education." (Steele 2010, p. 161).

Despite the looming presence of stereotype threats in our classrooms, research indicates that instructors have the capacity to help counteract the effects of stereotype threat. Two strategies may be employed by instructors with particular relevance for architectural design studios. First is what Steele refers to as the "Tom Ostrom strategy" after his own dissertation advisor. This strategy entails setting and communicating high standards clearly along with your faith in the students' ability to meet those standards. Decades after finishing school and becoming a successful architect, Cynthia Weese could still recall her own experience of this kind: "My freshman year I nearly failed...The dean called me in. I had a scholarship and I had to be put on academic probation. And he said, 'I know it's hard and I know you'll do better.' And the second semester I did much better" (Anthony 2012, p. 217-18). The dean, in this case, did not suggest architecture school was easy or manageable. He was honest about the difficulty, but he coupled that honesty with his confidence in Weese's ability to succeed. Making high standards explicit and clear helps alleviate student anxieties about being treated differently based on identity stereotypes. When instructors communicate high expectations coupled with confidence

[4] See, for example, ArchDaily's story on architects in movies: https://www.archdaily.com/33366/fictional-architects-in-movies

in a student's ability to meet them, it helps create a sense of belonging.

Narrative intervention, the second strategy relevant for architecture instructors, counters stereotype threats by providing narratives of success shared by students further ahead in the program. Studies demonstrated that when students entering a program learned firsthand about the struggles and success of more senior students, they recognized that success was possible. One study, for example, saw the grades of Black students who had a brief narrative intervention average a third of a letter grade higher than students in a control group (Steele 2010, p. 168). Narrative interventions that provide real life examples through mentoring programs, for example, help entering students develop perspective on their own struggles and quiet stereotype anxieties. In architecture school, one can imagine that hearing more senior students' narratives of struggling with, but ultimately succeeding in, a challenging structures course would help incoming students develop confidence in their own ability to do the same.

These two strategies, drawn from Steele's decades of work in this field, provide architecture studio instructors with tools to counter the effects of stereotype threat on students. They do not, however, address the full complexity and power of stereotypes in our society, profession, and classrooms, which is beyond the scope of this paper. More research is needed to understand how instructors may be able to actively reveal, counter, and break stereotypes. "The Elephant in the (Well-Designed) Room," summarized research and recommendations for how to interrupt and counter bias in the professional realm of architecture (Williams, Korn, and Mass, 2021). To understand how design studio instructors might actively interrupt, reveal, counter and break stereotypes in their classrooms is another research challenge we must collectively confront.

CONCLUSION

Several strategies intersect all three bodies of research—Ericsson and Pool's tools for developing expertise (2016), Ambrose et al.'s techniques for improving motivation (2010), and Steele's suggestions for reducing stereotype threat (2010)—and offer excellent starting points for rethinking the instructor's role in inclusive design studios.

Mentoring

First, it is important to prioritize the development of a positive environment, which improves motivation and reduces stereotype threat. One important way to do this, while also improving student efficacy, is through peer-to-peer and professional mentoring opportunities. When students have the opportunity to learn from peers or professionals who have advanced through the design studio and found ways to overcome the challenging curriculum, it gives them hope and affirmation that they, too, will be able to complete the curriculum. For design programs whose faculty are not as diverse as the student body, these mentoring relationships can be especially important for helping students of color and first-generation college students overcome stereotype threat. When they can be matched with mentors whose backgrounds align with their own, research shows that it is easier for them to see a path to success: their efficacy improves significantly. Mentoring does not have to come from peers or professionals but can also be a role that the design studio instructor takes on—and this is an important piece of helping students develop expertise. By providing consistent, constructive feedback in a manner that maintains a positive environment, the instructor can mentor the student toward developing the deliberate practice necessary to achieve expertise.

Clear assignments and assessments

It is crucial that design studio assignments are clearly laid out in a way that makes sense to a student "audience." Assignment requirements and learning objectives need to be written in plain language. The manner of assessment should be clearly laid out in a rubric, with each part weighted according to how important the knowledge, skill, or ability is at the present studio level. This will help students prioritize their investments of time and energy, while also building student efficacy and improving student trust in the process. The value of the assignments within the larger curriculum should be explained as well. This will help students view each assignment as part of their larger "deliberate practice" toward becoming a design professional. Setting well-defined, specific goals is an important part of developing expertise, and clear assignments can help students lay the foundation for setting their own goals.

Scaffolding

Finally, studio instructors can help their students build self-efficacy and enjoy a positive learning environment through intentional scaffolding. Here, it is important for instructors to understand clearly where each student's skills lie, so that they can help them stretch just beyond those skills to gradually achieve success over time, all while getting out of their comfort zones. This baby step approach allows students to achieve a feeling of early success ("I've got this!"), which improves their self-efficacy. This also helps to reduce the stereotype threat, as it affirms students in their belief that they belong and can progress through the curriculum. Where possible, connecting assignments to student interests can also help reduce the stereotype threat, as students can see an alignment between their sense of self and the curriculum.

Narrative interventions can also be a helpful part of the scaffolding process—where students learn about how past students achieved success in the same assignments and program and are even shown examples of past final products. Furthermore, instructors can scaffold student learning by being explicit about their own belief that all students can meet the high standards being set for them (the "Tom Ostrom strategy"). The ability for all students to achieve expertise is supported by research on deliberate practice (Ericsson and Poole 2016). As a part of scaffolding, it may be helpful for instructors to share this research and the required ingredients with students, so they understand that it is possible for each of them to succeed. This research also reinforces the notion that it's important for students to develop a sense of ownership and agency in their learning process, in particular, making time and space for focused practice.

Every design studio represents a unique community comprised of individuals from diverse backgrounds. In an inclusive design studio, it is the instructor's responsibility to help students understand that each of them can be successful, and that their paths don't need to be identical. Some students may need more or less attention, mentoring, or affirmation at different stages of the process. By building a positive learning environment designed to increase efficacy through tailored mentoring, clear expectations, and gradually shifting comfort zones, we can help motivate our students to navigate their own unique paths toward design expertise.

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