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### Design in the Classroom

Space is at a premium in New York City. In a metropolitan environment, crowded by over 8 million people, every square inch becomes extremely valuable. The reality of the limited access to space is crucial to the design and functionality of the city. Modern infrastructure has to incorporate multifunctional spaces. One room can no longer serve a singular purpose. New York City faces the challenge of conforming to this new standard of limited space. The architecture and design of learning institutions, such as classrooms in universities, face even higher limitations due to the current space shortage and population growth. Classroom design is a large component of the foundation of a student's learning experience. The physical composition and use of classrooms are too often undervalued by designers. These are spaces that will have a massive impact on society's younger generations. Although students do not often consider classroom design as significant to their education, the space that an individual learns in is directly correlated with how one comprehends and absorbs information.

Classrooms come in all different forms. Design is constricted by many factors relating to location, school size, field of study, etc. All of these elements impact the designer's decisions of what a classroom should look like. In more creative fields of study, students require space for both mental and physical learning. Conventional classrooms consist of four walls and some arrangement of desks with a central focal

point reserved for the teacher or professor. Although this regulated form may seem satisfactory to some, it does not maximize space at the scale at which it should. Small, closed off rooms further cloud learning outcomes by cheating students of an environment that encourages creativity, motivation, and community morale.

How can design work within the size restrictions without compromising the beneficiary elements that every classroom should incorporate? This is a question that forces designers to think abstractly so they can find best possible solution that welcomes both creativity and change within the classroom environment. When a classroom has the ability to transform into a collaborative and individual work space, the overall dynamic becomes more student oriented, allowing for friendships to form and for all students to participate. A solution as simple as changing the desks and chairs students use can optimize how each student and the classroom as a whole functions. The standard chair and desk seen in classrooms across the United States are frequently composed of heavy metal or wood and not easily moveable.<sup>1</sup> This setup, although sufficient, does not grant mobility or encourage collaboration within the classroom. Design elements such as furniture, color, accessibility, flexibility and exposure to light all factor into a lucrative learning environment. Many current classroom models do not offer enough quality equipment, visual stimulation, open or easily accessed corridors, and natural light. Designers can redefine the standards that are set

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<sup>1</sup> Gurzynski-Weiss, Laura, Avizia Y. Long, and Megan Solon. "Comparing Interaction and Use of Space in Traditional and Innovative Classrooms." *Hispania* 98, no. 1 (2015): 61-78. <http://www.jstor.org/stable/24368852>.

for a high quality education. Students that have the ability to transform their own work space can create an individualized, personalized experience for how they learn.

A lot of students do not often reflect on small room they built a project in, the drab space where they presented it to the class, or the dark room they took a final in. At the time, it may have seemed irrelevant to the outcome or results of the assignment. Why would the color or size of a classroom affect how effectively a student grasped information? This is the question researchers sought to answer through studies of student learning outcomes in relation to classroom design. Through data collected in a year long study by the University of Salford, located in Manchester, UK, along with research conducted by the architects of Nightingale Associates, detailed evidence of how student performance in 153 classrooms in 27 diverse schools was affected by design composition was revealed. The findings of the “Clever Classroom Report” stated that, “differences in physical characteristics of classrooms explain 16% of the variation of learning progress over a year for the 3766 pupils included in the study.”<sup>2</sup> The variation of moving a student from the “least effective” to the “most effective” space progressed their learning by a full academic year. This data reveals just how much of an impact classroom design has. The study was broken down into three types of physical characteristics: naturalness, individualization, and stimulation. Each component was assessed in every classroom studied and found to be very influential in student learning outcomes. The naturalness section incorporated light, temperature, and air quality within each room. Individualization entailed ownership and flexibility in the

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<sup>2</sup> Barrett, Peter , Yufan Zhang, Fay Davies, and Lucinda Barrett. *Clever Classroom's: Summary Report of the HEAD Project*. Rep. N.p.: n.p., n.d. *University of Salford Manchester: Clever Classrooms*. University of Salford, Feb. 2015. Web. May 2017. <<https://www.salford.ac.uk/cleverclassrooms/1503-Salford-Uni-Report-DIGITAL.pdf>>.

rooms' composition. The stimulation category rated the complexity of color within the classrooms. These three parameters were further broken down into terms of specific features of design.<sup>3</sup>

The naturalness portion of design elements accounted for around half of the change found in the students monitored. The study found that natural light provided students with both physical and mental ease beyond just the ability to see more clearly. Large windows provide an abundance of natural light as well as significantly increasing the quality of air within a classroom.<sup>4</sup> Alongside central ventilation, heating and cooling, large windows provide major benefits for regulating a comfortable environment. Noise level was also found to affect the quality of communication between students and impacted their productivity as well. The ability to control sound within a space can widen the function within a room. Having controlled, acoustic areas for quiet concentration as well as open communication, can provide students with the ability to work efficiently at their own rate. Collapsible walls and transformable infrastructure is a great alternative to brick or concrete. The effects of these elements are noted in student behavior as well as test scores and recorded learning progress.

Individualization of classrooms can provide unique conditions for learning spaces personalized for different behaviors. This allows for flexibility of the design of classrooms. Working with a larger population of students means that classrooms have

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<sup>3</sup> Barrett, Peter , Yufan Zhang, Fay Davies, and Lucinda Barrett. *Clever Classroom's: Summary Report of the HEAD Project*. Rep. N.p.: n.p., n.d. *University of Salford Manchester: Clever Classrooms*. University of Salford, Feb. 2015. Web. May 2017. <<https://www.salford.ac.uk/cleverclassrooms/1503-Salford-Uni-Report-DIGITAL.pdf>>.

<sup>4</sup> Barrett, Peter , Yufan Zhang, Fay Davies, and Lucinda Barrett. *Clever Classroom's: Summary Report of the HEAD Project*. Rep. N.p.: n.p., n.d. *University of Salford Manchester: Clever Classrooms*. University of Salford, Feb. 2015. Web. May 2017. <<https://www.salford.ac.uk/cleverclassrooms/1503-Salford-Uni-Report-DIGITAL.pdf>>.

to accommodate for a higher rate of students' unique characteristics. The most successful models of this are shown in classrooms that can transform the space. Learning environments with open corridors and designated "learning", "storage" and "breakout" regions were found to have favorable impacts on students.<sup>5</sup> A room that can transform from a space that accommodates a large community to a small personal support area maximizes space while meeting the needs of every individual. Large, walled off areas and varied shapes within the floorplan also aid participation and feedback between students. According the book "Moral Classrooms, Moral Children", "When children feel ownership of the classroom, it appears the stage is set for cultivating feelings of responsibility"<sup>6</sup> Flexibility of design provides students with a sense of ownership. Having both open and closed work regions in a classroom gives people a chance to locate where they feel most comfortable.

Visual stimulation can affect learning ability in both negative and positive ways. What some may see as an awakening color might be a source of distraction to others. A study by renowned phycologists Karrie Godwin and Anna Fisher shows that, "children in low visual distraction conditions spend less time off task and obtain higher learning scores than children in high visual distraction conditions."<sup>7</sup> In contrast, the study "Clever Classroom" found that, "differentiated spaces with varying ceiling heights and wall colors, supported cooperative behavior, albeit the effect could become

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<sup>5</sup> Barrett, Peter , Yufan Zhang, Fay Davies, and Lucinda Barrett. *Clever Classroom's: Summary Report of the HEAD Project*. Rep. N.p.: n.p., n.d. *University of Salford Manchester: Clever Classrooms*. University of Salford, Feb. 2015. Web. May 2017. <<https://www.salford.ac.uk/cleverclassrooms/1503-Salford-Uni-Report-DIGITAL.pdf>>.

<sup>6</sup> DeVries, Rheta, and Betty Zan. *Moral classrooms, moral children: creating a constructivist atmosphere in early education*. New York: Teachers College Press, 2012. Print.

<sup>7</sup> Anna V. Fisher, Karrie E. Godwin, Howard Seltman. Visual Environment, Attention Allocation, and Learning in Young Children. *Psychological Science* Vol 25, Issue 7, pp. 1362 - 1370. First published date: May-21-2014

counterproductive if the space became too complex. (Read Jalil et al, 1999)” Finding common ground between too many and too few visual features within a room is key to creating a successful learning climate. The “Clever Classroom” report found that walls with 50-70% well organized surface coverage were the most productive. Classroom size and ceiling height also affected how visually stimulating the classroom was. Color is one of the most impactful factors that should be prioritized when creating a balanced classroom environment. Color can be used to relieve stress, evoke emotion, and increase attention span. Many studies have gone as far as proving that colored components can affect personal well being as well as brain activity in students. Many researchers agree that having a room with most walls painted a light color and having a few bright colors featured was “most effective for learning.”<sup>8</sup>

How can a classrooms be designed to optimize use and improve functionality in areas confined by high population and limited space? In order to optimize space in a classroom, one must first evaluate the current model. The New School’s 2 West 13th Street building is a hub for first year creative and fine art students. The tall and skinny building stands at 12 floors of entirely square classrooms. After recent renovation projects to maximise building space and improve classroom quality, The New School has addressed a few of the design flaws within the building. The Making Center is a new addition to the building that provides students with a large open space to design and construct their projects. Tall ceilings, large windows, mobile desks and a resource center are what make this space exceptional. While nearing the end of my first

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<sup>8</sup> Barrett, Peter , Yufan Zhang, Fay Davies, and Lucinda Barrett. *Clever Classroom's: Summary Report of the HEAD Project*. Rep. N.p.: n.p., n.d. *University of Salford Manchester: Clever Classrooms*. University of Salford, Feb. 2015. Web. May 2017. <<https://www.salford.ac.uk/cleverclassrooms/1503-Salford-Uni-Report-DIGITAL.pdf>>.

academic year at The New School, I was able to reflect on how the classrooms I have worked in all year have impacted my learning as a student. If I had the opportunity to redesign the current classroom model at the 2 West 13 Street building, I would take the research I have done into great consideration. With my experience using the Making Center, I am able to evaluate the benefits of working within a transformable, flexible space. I would combine the wasted space within each floor of the building to eliminate non integral walls and in doing so, create an open work environment. To make the space multifunctional, I would incorporate collapsable walls that could be guided by ceiling tracks. To go further, I would find lightweight desks and chairs that could fold flat and be rearranged with ease. The walls of the floor would be painted a light color with subtle accents of “New School” red on furniture to compliment the bright atmosphere. On the light colored walls would stand floor to ceiling whiteboards for student idea collaboration. To brighten the floor, I would expand already existing windows to maximise the natural light within the classroom. These design modification would expand on the already valuable resources The New School provides. Supplying optimal natural light alongside a stimulating environment would optimise student learning potential. Ultimately flexible design and improved infrastructure puts design in the hands of the user.

## Bibliography:

Gurzynski-Weiss, Laura, Avizia Y. Long, and Megan Solon. "Comparing Interaction and Use of Space in Traditional and Innovative Classrooms." *Hispania* 98, no. 1 (2015): 61-78.

<http://www.jstor.org/stable/24368852>. This source examines the relationship between the student and the classroom. Gurzynski-Weiss breaks down each aspect of the modern classroom and how it affects a child's ability to understand and succeed at school. This article provides helpful analysis for my research into transformable space.

HASWELL, RICHARD, and JANIS HASWELL. *Hospitality and Authoring: An Essay for the English Profession*. University Press of Colorado, 2015. <http://www.jstor.org/stable/j.ctt14jxwqx>. This essay discusses territory in the classroom and how space affects students ability to learn information. This source also delves into hospitality and ethics within the classroom. I will use this information to back up my thesis statement.

Ming-tak, Hue, and Li Wai-shing. *Classroom Management: Creating a Positive Learning Environment*. Hong Kong University Press, 2008. <http://www.jstor.org/stable/j.ctt1xw9ng>. This source breaks down the understanding of classroom management and how space can influence behavior and culture. The real life examples and detailed analysis will be extremely helpful in explaining the basis for my research and studio project.

New Teachers: Designing Learning Environments." *Edutopia*. N.p., 07 May 2015. Web. 18 Apr. 2017. This website article simply defines how aspects of design influence learning outcomes. It further develops my projects thesis by exploring more effectively designed spaces for students to learn in.

DeVries, Rheta, and Betty Zan. *Moral classrooms, moral children: creating a constructivist atmosphere in early education*. New York: Teachers College Press, 2012. Print.

Active, BBC. "How does the classroom environment affect learning?" *How does the classroom environment affect learning?* © 2010 Educational Publishers LLP, n.d. Web. 18 Apr. 2017. This online article provides concrete evidence of how the design of the classroom influences a student's ability to successfully absorb knowledge. This source also describes the challenge of a large population and limited amount of space, as well as, gives examples of more successful classroom models.



"The impact of classroom design on pupils' learning: Final results of a holistic, multi-level analysis." *The impact of classroom design on pupils' learning: Final results of a holistic, multi-level analysis*. N.p., n.d. Web. 18 Apr. 2017. Copyright © 2017 Elsevier B.V. This is a study that analyzed the impacts of classroom design on learning outcomes. This will serve my research by providing numerical evidence of affected students.

Barrett, Peter , Yufan Zhang, Fay Davies, and Lucinda Barrett. *Clever Classroom's: Summary Report of the HEAD Project*. Rep. N.p.: n.p., n.d. *University of Salford Manchester: Clever* Anna V. Fisher, Karrie E. Godwin, Howard Seltman. Visual Environment, Attention Allocation, and Learning in Young Children. *Psychological Science* Vol 25, Issue 7, pp. 1362 - 1370. First published date: May-21-2014 *Classrooms*. University of Salford, Feb. 2015. Web. May 2017. <<https://www.salford.ac.uk/cleverclassrooms/1503-Salford-Uni-Report-DIGITAL.pdf>>.