A Solution-Finding Report

Title: *Best Practices in the Design of Instructional Spaces*
Date: October 16, 2015

This Solution-Finding Report provides information, requested by the Southeast Comprehensive Center at SEDL/American Institutes for Research, on behalf of one of its states, for resources related to best practices in the design of instructional spaces.

Solution-finding Reports are intended to provide a quick response to the request for information; they are not intended to be a definitive literature survey or synthesis of the topic.

Brooks, D. C. (2011). Space Matters: The Impact of Formal Learning Environments on Student Learning. *British Journal of Educational Technology*, *42*(5), 719–726.

http://www-dev.csusm.edu/iits/ids/documents/flipped-research/Space%20Matters.pdf

The objective of this research is to identify the relationship between formal learning spaces and student learning outcomes. Using a quasi-experimental design, researchers partnered with an instructor who taught identical sections of the same course in two radically different formal learning environments to isolate the impact of the physical environment on student learning. The results of the study reveal that, holding all factors excepting the learning spaces constant, students taking the course in a technologically enhanced environment conducive to active learning techniques outperformed their peers who were taking the same course in a more traditional classroom setting. The evidence suggests strongly that technologically enhanced learning environments, independent of all other factors, have a significant and positive impact on student learning.

Brooks, D. C. (2012). Space and Consequences: the Impact of Different Formal Learning Spaces on Instructor and Student Behavior. *Journal of Learning Spaces*, *1*(2), 1–13.

http://libjournal.uncg.edu/index.php/jls/rt/printerFriendly/285/275

This article presents the results of a quasi-experimental research project investigating the impact of two different formal learning spaces – a traditional classroom and a technologically enhanced active learning classroom – on instructor behavior, classroom activities, and levels of on-task student behavior at the University of Minnesota. Using time-series data collected as part of a series of classroom observations, the authors demonstrate that not only are clear differences manifest in terms of what occurred within each space, but that the different classroom types are linked causally to the observed differences in instructor and student behavior.

Casson, K. (2012). *Instructional Goals and Classroom Space*. Chapel Hill, NC: University of North Carolina at Chapel Hill School of Education.

http://www.learnnc.org/lp/pages/738?ref=search

This article begins, “Your classroom should be arranged to help you meet your pedagogical goals. Any setting, including your classroom, exerts many and frequently subtle influences on the people in that environment. (Restaurant reviewers call it ‘ambience,’ and they rate it along with the quality of the food.) An uncomfortable environment can jeopardize the very climate you are trying to create. Good environments are frequently flexible ones.”

Duncanson, E., Volpe, J., & Achilles, C. (2009). A Case Study: Natural Outcomes of Creating Classroom Space. *National Forum of Educational Administration and Supervision Journal*, *26*(4), 1–9.

http://www.nationalforum.com/Electronic%20Journal%20Volumes/Duncanson,%20Edward%20Natural%20Outcomes%20of%20Creating%20Classroom%20Space%20NFEAS-26-4-09.pdf

Having empty floor space in a classroom contributes to student achievement, but how open space influences teaching and learning is not as well understood. In this case study, researchers coached two teachers in a rural elementary school regarding the reduction of material and furniture, and using storage and classroom organization to support the taught curriculum. The researchers observed the classrooms multiple times to uncover teacher and student behaviors that emerge when a classroom is planned around space. Increasing the amount of empty floor space had a positive influence on affective behavior, organization, and opportunities for student learning.

Educause. (2013). *Things You Should Know About...Collaborative Learning Spaces*. Washington, DC: Author.

https://net.educause.edu/ir/library/pdf/ELI7092.pdf

According to this article, "Historically, classrooms and lecture halls have been designed with all students facing a desk or lectern for the instructor. This arrangement is appropriate for a specific type of teaching but is ill-suited for other approaches, particularly when students work in groups. As a result, a number of alternative classroom designs have emerged to support collaborative learning."

Harrison, G. (2011). *Classroom Seating: Which Arrangement is Best?* Santa Barbara, CA: Lesson Planet.

http://www.lessonplanet.com/article/education/classroom-seating-which-arrangement-is-best

According to the author, "The way you arrange your students' desks is an important choice that will impact your classroom environment."

Harvey, E. J., & Kenyon, M. C. (2013). Classroom Seating Considerations for 21st Century Students and Faculty. *Journal of Learning Spaces*, *2*(1).

http://libjournal.uncg.edu/jls/article/view/578/454

This quantitative, cross-sectional research study explored students' perceptions of five different seating styles within typical classrooms in an urban public higher education institution. The five seating styles included: modern mobile chairs; tablet arm chairs; fixed tiered seating with tablet arms; rectangle tables with standard chairs; and trapezoid tables with chairs on casters.

Julian, S. Reinventing Classroom Space to Re-energise Information Literacy Instruction. *Journal of Information Literacy*, *7*(1), 69–82.

http://ojs.lboro.ac.uk/ojs/index.php/JIL/article/view/LLC-V7-I1-2013-2/1798

This article found, "The classroom design can re-energise instruction if the teacher adapts their teaching style to the more flexible learning environment."

Kaya, N., & Burgess, B. (2007). Territoriality: Seat Preferences in Different Types of Classroom Arrangements. *Environment and Behavior*, 39(6), 859–876.

http://eab.sagepub.com/content/39/6/859.full.pdf+html

For this paper, "Students' degree of territoriality based on gender and seat preferences in different types of classroom arrangements was studied. The types of classroom arrangements included rows of tablet-arm chairs, U-shaped, clusters, and rows of tables with individual chairs."

Kregenow, J. M., Rogers, M., & Price, M. F. (2011). Is There a "Back" of the Room When the Teacher Is In the Middle? *Journal of College Science Teaching*, 20(6), 45–51.

http://faculty.ithaca.edu/mrogers/docs/Publications/ART08Kregenow2011.pdf

For this study, the authors "studied student seating habits in both a traditional lecture hall with the instructor in the front and in a SCALE-UP (Student-Centered Activities for Large Enrollment Undergraduate Programs) studio-style classroom with the instructor in the middle. Like several previous authors, we find that students with higher course grades tend to sit in the front of a lecture hall and those with lower course grades toward the back. However, no clear pattern of either high or low grades appears in a SCALE-UP classroom. We compare our results with previous studies, both those using assigned seating and those allowing free-seat selection, as we did."

Krych, M. P. (2014). *Placement of the Teacher's Desk*. River Falls, WI: Teaching On Purpose.

http://teachingonpurpose.org/journal/placement-of-the-teachers-desk/

The question of where to put the teacher's desk in the classroom often goes unanswered or is lost in the commotion of setting up the rest of the classroom. This article examines and compares the effects of placing the teacher's desk in the front of the room, the back of the room, and having no desk at all.

Langevin Learning Services. (2009). *The Power of Seating Arrangements*. Ogdensburg, New York: Author.

http://www.langevin.com/blog/2009/12/07/the-power-of-seating-arrangements/

According to this article, "When thinking about the learning environment, good trainers must consider many variables including seating arrangements. Having the proper seating arrangement can impact everything from group dynamics to comfort and visibility….[F]or those of you who have the luxury of arranging your seating, the following list provides some scenarios you might encounter in the classroom, and may influence decisions when it comes to making seating arrangements."

Maryland Learning Links. (2011). *Your Classroom*. Baltimore, MD: Author.

http://marylandlearninglinks.org/2021

This article states, "One simple rule for designing your classroom for differentiated instruction is this: different areas for different needs. If your class is filled with auditory learners, you might want to make a listening center a focal point of your room. If you have a great number of students who are more visual, an art area where supplies are easy to reach will be a great help to them."

McArthur, J. A. (2015). Matching Instructors and Spaces of Learning: The Impact of Classroom Space on Behavioral, Affective and Cognitive Learning. *Journal of Learning Spaces, 4*(1).

http://libjournal.uncg.edu/jls/article/view/766/817

This study examined the extent to which instructional proxemics – the physical space of the learning environment – impacts student behavioral, affective, and cognitive learning.

Neill, S., & Etheridge, R. (2008). Flexible Learning Spaces: The Integration of Pedagogy, Physical Design, and Instructional Technology. *Marketing Education Review, 18*(1), 47–53.

http://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1022&context=mkt_fac

To support pedagogical innovation, educators must reexamine physical space. This paper describes a project to redesign an existing classroom into a flexible learning space. The desired outcome was a classroom that would support a variety of pedagogical approaches and learning experiences. The findings, based on data gathered from students and faculty, indicate that the renovated classroom increases student engagement, collaboration, flexibility, and learning. A flexible learning space better enables innovative approaches to teaching and learning when compared to the traditional classroom.

Phillips, M. (2014). A Place for Learning: The Physical Environment of Classrooms. San Rafael, CA: Edutopia.

http://www.edutopia.org/blog/the-physical-environment-of-classrooms-mark-phillips

The author of this article writes, "It's conventional wisdom that different types of instruction require different seating arrangements. It's also a no-brainer that classrooms should be inviting, environments that make students feel good to be there. Unfortunately, over the years I've visited classroom after classroom where conventional wisdom appeared to be disregarded. So here's a short course."

Professional Learning Board. (2015). *Do Seating Arrangements Have an Impact on Student Learning?* Minneapolis, MN: Author.

https://k12teacherstaffdevelopment.com/tlb/contact-us/

This article asks the question, "How can we adjust the seating arrangements to learning's advantage? Let's explore some possibilities of creating optimal seating arrangements to advance learning in class," then discusses the row arrangement, the circle arrangement, the semicircular arrangement, the round table arrangement, and arranged seating vs. free seating.

Sansivero, G. (2015). *Designing Modern Classrooms -- Step 1: Transforming the Traditional Classroom into an Engaging Learning Environment*. Charlotte, NC: SouthEast Educational Network.

http://seenmagazine.us/articles/article-detail/articleid/4702/designing-modern-classrooms.aspx

This article begins, "Technology rich classrooms offer incredible benefits for both students and instructors. From fostering blended learning environments through collaboration, critical thinking and practical problem solving to flipped rooms centered on student engagement; the classroom that was focused on traditional teaching has evolved into active learning. Often, when renovating existing or creating new classrooms, incorporating the technology into the room begins after the furniture placement and room configuration is set. Frequently this process creates an obstacle to the implementation of truly modern active learning classrooms that wasn't considered or foreseeable when the room was originally laid out."

Schibsted, E. (2005). *Rearrange the Desks: Reposition the Students' Seats to Help Retain their Attention*. San Rafael, CA: Edutopia.

http://www.edutopia.org/rearrange-desks

This article describes, in part, the work of Franklin Hill, a well-regarded facility planner and futurist who advises educators on inexpensive ways to improve their classroom's effectiveness. According to Hill, "School classrooms should have no bad seat. Poorly designed learning environments distort the information presented to our students by hindering their ability to see and hear and participate. This hampers their ability to learn."

Szparagowski, R. (2014). *Effects of Altering Student Seating Position on Student Learning in an 8th Grade Mathematics Classroom*. Honors Projects. Paper 115. Bowling Green, OH: Bowling Green State University.

http://scholarworks.bgsu.edu/cgi/viewcontent.cgi?article=1131&context=honorsprojects

According to this author, there are three main categories of seating arrangements – the traditional rows and columns seating, semicircle formations, and group seating arrangements – and each has different benefits to student learning. Seating students in rows has been found to double on-task behavior of students and reduce inappropriate behavior. In a semi-circle formation, students develop a greater sense of community, ask more questions, and interact with other students more often – benefits that could significantly enhance student discussion-based lessons. Group seating arrangements help facilitate student interaction. Each seating arrangement has several benefits, which teachers can utilize to accommodate lessons. To improve efficiency, teachers should let the nature of the task dictate student seating arrangement. Maximizing the teacher's efficiency could include changing seating arrangements on a weekly or even daily basis to accommodate individual lessons.

Taege, J., Krauter, K., & Lees, J. (2015). Personalized Learning in Wisconsin: FLIGHT Academy. *Connect: Making Learning Personal.* Philadelphia: Center on Innovations in Learning.

http://www.centeril.org/connect/resources/Connect_FLIGHTAcademy-2015_02.27.pdf

In the context of discussing the establishment of a school-within-a school academy devoted to a personalized learning model, this report provides a rationale for the design of the academy's floorplan. "The physical layout of the FLIGHT Academy is made up of seven different but interconnected learning spaces, spaces that enable students and advisors to freely rotate to an appropriate space throughout the day. Each area can be configured to support any learning model or strategy."

Wannarka, R., & Ruhl, K. (2008). Seating Arrangements that Promote Positive Academic and Behavioural Outcomes: A Review of Empirical Research. *Support For Learning*, *23*(2), 89–93.

http://www.corelearn.com/files/Archer/Seating_Arrangements.pdf

According to this paper, "The purpose of this synthesis of empirical literature is to determine which arrangements of desks best facilitate positive academic and behavioural outcomes for primary through secondary high school students with a range of characteristics."

Wasnock, David P. *Classroom Environment: Emphasis on Seating Arrangement*. Mathematical and Computing Sciences Masters. Paper 17. Rochester, NY: St. John Fisher College.

http://fisherpub.sjfc.edu/cgi/viewcontent.cgi?article=1016&context=mathcs_etd_masters

This paper reports of the importance of the classroom environment, and has a major focus on seating arrangement. A survey was distributed to 10 different school districts, and reports were

collected from 64 different teachers who taught varying grade levels and subjects. The analyzed data showed that the majority of teachers choose to use combination seating arrangements rather than row seating. The data also reports on why teachers prefer to use grouping in their classrooms, and shares information on the benefits of this type of arrangements.

Watson, A. (2015). *Ideas for Classroom Seating Arrangements*. Fort Lauderdale, FL: The Cornerstone.

http://thecornerstoneforteachers.com/free-resources/organization/classroom-seating-arrangements

This article provides tips on arranging students' desks in four different formations, complete with photos, along with the pros and cons, and a discussion, of each arrangement.