REL PACIFIC
Regional Educational Laboratory at McREL International

REL Pacific Ask A REL Response

Postsecondary

November 2019

Question:

What are examples of effective learning spaces and design in higher education institutions?

Response:

Following an established REL Pacific research protocol, we conducted a web-based search for resources related to learning spaces and design and their influence on student outcomes (see Methods section for search terms and resource selection criteria). We focused our search on studies in the Pacific and other indigenous contexts for greater relevancy to our partners in the Pacific region; however, we included studies with more generalizable findings due to the limited amount of research available in these contexts.

References are listed in alphabetical order, not necessarily in order of relevance. Descriptions of the resources are quoted directly from the publication abstracts. We have not evaluated the quality of references and the resources provided in this response. We offer them only for your reference. Also, our search included the most commonly used research resources, but they are not comprehensive and other relevant references and resources may exist.

Research References

Byers, T., Imms, W., & Hartnell-Young, E. (2014). Making the case for space: The effect of learning spaces on teaching and learning. *Curriculum and Teaching, (29)*1, 5–19. Retrieved from https://eric.ed.gov/?q=making+the+case+for+space&id=EJ1177387.

From the abstract: "An explanatory, mixed method study examined the impact of learning spaces on teachers' pedagogy, student engagement and student learning outcomes in a technology-rich school setting. Its quasi-experimental design allowed examination of differences in these variables between two settings— 'traditional' classrooms, and 'new generation learning spaces' (NGLS). Results from quantitative analyses over a one-year period indicated that particular configurations of learning spaces did have a measurable effect on how students' perceived their learning experiences and their engagement levels, with improvements often linked to NGLS. In addition, comparative analyses of experimental and control group standardized assessment data in subjects English and mathematics indicated a similar effect for the same participants. The study suggests that a single-subject, repeated measures design (SSRD) can be used to measure the outcomes effect of space on student learning outcomes. In this regard, this approach addresses a perceived lack of empirical data highlighted by recent reviews of research on this topic."

Chen, V., Leger, & A., Riel, A. (2016). Standing to preach, moving to teach: What TAs learned from teaching in flexible and less-flexible spaces. *Collected Essays on Learning and Teaching, 9,* 187–198. Retrieved from https://eric.ed.gov/?id=EJ1104468.

> *From the abstract:* "This paper examines the effect of the architectural layout of two classrooms (one flexible and one less-flexible) on Teaching Assistants' (TAs) movement and interactions with students. Four TAs from a first-year undergraduate introductory course were chosen for the two studies. In study 1, the TAs taught the same lesson twice to two groups of students on the same day but in different classrooms, thereby controlling for content differences. Study 2 investigated the impacts that flexible and non-flexible spaces have on the same cohort of students, as the TAs continued to teach the same students but the students switched classrooms for the second half of the course, thereby controlling for differences in student participants. From the video analyses, there was a clear difference in how the TAs moved in the classroom and the interactions they had with students. Both TAs and students reported in surveys that there was a difference in their movement in the respective rooms that had an impact on their teaching and learning quality. This finding starts the conversation on how space can affect TAs, in order for TAs to consider how their movement is affected by classroom configurations, and how this change in movement can affect teaching strategies and impact their students' learning."

Cleveland, B. & Fisher, K. (2014). The evaluation of physical learning environments: A critical review of the literature. *Learning Environments Research, 17*(1), 1–28. Retrieved from https://eric.ed.gov/?id=EJ1038900.

> *From the abstract:* "This article critically reviews the methodologies and methods that have been used for the evaluation of physical learning environments. To contextualize discussion

about the evaluation of learning spaces, we initially chart the development of post-occupancy evaluation (POE) for non-domestic buildings. We then discuss the recent evolution of POE into the broader evaluative framework of building performance evaluation. Subsequently, a selection of approaches used to evaluate higher education and school learning environments are compared and critically analyzed in view of contemporary approaches to teaching and learning. Gaps in these evaluative approaches are identified and an argument is put forward for the evaluation of physical learning environments from a more rigorous pedagogical perspective."

Cotterill, S. T. (2015). Tearing up the page: Re-thinking the development of effective learning environments in higher education. *Innovations in Education and Teaching International, 52*(4), 403–413. Retrieved from https://eric.ed.gov/?id=EJ1062219.

From the abstract: "The development of effective learning environments in higher education (HE) appears to become increasingly prioritised by HE institutions. This approach reflects an increasingly 'consumer' focused student body, and HE attempt to further quantify the quality of their products. However, all too often attempts to build more effective learning environments are hampered by the structures and processes that have historically existed in HE. The traditional lecture-seminar approach is increasingly been seen as not supporting effective student learning. As a result, the quality of the student learning experience is being compromised. This paper explores some of the factors currently limiting the development of effective learning environments and considers relevant questions and possible solutions. In particular, this paper explores the degree to which University interactions with student groups are driven by quality assurance processes rather than for maximising student learning."

Crawford, C. M. (2016). Designing and instructing hybrid open learning spaces model to support lifelong learning engagement. *International Journal on E-Learning, 15*(3), 285–312. Retrieved from https://eric.ed.gov/?id=EJ1113354.

From the abstract: "With a focus upon open and lifelong learning understanding, the real world delineation between formalized higher education graduate school efforts and professional career position lines may be suggested as being blurred. This case study offers an analysis of one university instructor's efforts towards developing hybrid learning spaces that specifically focus upon not merely knowledge acquisition but the implementation of learned information within real world professional work environments, which suggests not only the business and industry realm, but also the elementary and secondary school education environments, medical education, and higher education. The outcome of the discussion is a hybrid open learning spaces model. Through this style of instructional design at the graduate level of higher education instruction, the work place professionals become engaged and participatory within the higher education coursework environment."

Ellis, R. A. & Goodyear, P. (2016). Models of learning space: Integrating research on space, place and learning in higher education. *Review of Education, 4*(20), 149–191. Retrieved from https://eric.ed.gov/?id=EJ1104278.

From the abstract: “Learning space research is a relatively new field of study that seeks to inform the design, evaluation and management of learning spaces. This paper reviews a dispersed and fragmented literature relevant to understanding connections between university learning spaces and student learning activities. From this review, the paper distils a number of core concerns and identifies some gaps in the literature. One of its primary goals is to clear the ground for the construction of ‘models’ of learning space that can be used by the various parties involved in the design and evaluation of new learning spaces: teachers, architects, interior designers, IT managers, educational leaders and students. A closely related goal is to help those participating in learning space research locate and understand each other's contributions. Fragmentation in research related to learning and physical spaces makes progress in the field slow. Our review makes two passes over the field: drawing together research from architecture, the learning sciences, environmental psychology, human computer interaction and elsewhere to identify research foci and gaps, and then also capturing some work by learning space researchers that directly attempts to model the main relationships in the field. The paper ends with a summary of implications for research and practice.”

Perks, T., Orr, D., & Alomari, E. (2016). Classroom re-design to facilitate student learning: A case study of changes to a university classroom. *Journal of the Scholarship of Teaching and Learning*, *16*(1), 53–68. Retrieved from https://eric.ed.gov/?id=EJ1092431.

From the abstract: "This case study examines the physical aspects of a particular university classroom, and what affect specific changes to the classroom had on the perceptions of students, instructors and observers regarding the room as an effective learning space. We compare survey and focus group data collected from students taking courses in the classroom prior to changes to the physical environment with comparable data from students taking courses in the same classroom after specific changes had been made. Immediately following changes to the classroom, notable increases were observed in reported perceptions of student satisfaction with the physical environment, including perceptions of the classroom as a more effective and engaging learning space. Similar perceptions of improvement as a teaching-learning space were reported by instructors and observers. However, subsequent follow-up data collection and analyses suggested little if any sustained increase in perceptions of efficacy of the room as a learning space; indeed, most reported variables returned to baseline levels. The implications of these findings and their relevance to classroom design nevertheless may provide insight regarding the manner in which physical space might support or even enhance teaching and learning."

Rabidoux, S. & Rottmann, A. (2018). Re-envisioning the archaic higher education learning environment: Implementation processes for flipped classrooms. *International Journal on E-Learning*, *17*(1), 85–93. Retrieved from https://eric.ed.gov/?id=EJ1164379.

From the abstract: “Flipped classrooms are often utilized in PK–12 classrooms; however, there is also a growing trend of flipped classrooms in higher education. This paper presents the benefits and limitations of implementing flipped classrooms in higher education as well as resources for integrating a flipped classroom design to instruction. The various technology resources will assist higher education instructors in effectively implementing flipped

classrooms. The paper also states the need for further empirical evidence to validate the implementation of flipped classrooms in higher education."

Vercellotti, M. L. (2018). Do interactive learning spaces increase student achievement? A comparison of classroom context. *Active Learning in Higher Education, 19*(3), 197–210. Retrieved from https://eric.ed.gov/?id=EJ1193764.

> *From the abstract:* "Research on interactive learning space classrooms has reported that instructors and students find them engaging, and engagement is expected to increase learning outcomes. Positive findings about interactive classrooms, though, are often confounded with active learning pedagogy since instructors who teach in interactive classrooms tend to also promote active learning pedagogy. More research is needed to tease apart learning gains from the instructional design, classroom context, and the related incorporation of technology. This study examined the relationship between learning gains and classroom context (traditional and interactive learning space) in a pretest/posttest design and reviewed student survey responses about learning experiences. Participants were enrolled in one of two sections of a course. Both groups were taught by the same instructor using active learning pedagogy with the same activities, materials, and assignments. The results showed that classroom context did not result in differences in students learning overall. Some findings pointing to subtle differences, however, indicate that the interactive classroom could have made the classroom instruction more effective and efficient."

Methods

Keywords and Search Strings

The following keywords and search strings were used to search the reference databases and other sources:

- "learning environments" and "higher education"
- "learning spaces" and "higher education"
- "learning space design" and "higher education"

Databases and Resources

We searched ERIC, a free online library of over 1.6 million citations of education research sponsored by the Institute of Education Sciences, for relevant resources. Additionally, we searched Google Scholar.

Reference Search and Selection Criteria

REL Pacific searched ERIC and other academic journal databases for studies that were published in English-language peer-reviewed research journals within the last 10 years. REL Pacific prioritized documents that are accessible online and publicly available, and prioritized references that provide practical information based on peer-reviewed research for the higher education

leader who requested this Ask A REL.[1] Sources included in this document were last accessed in November 2019. Methodological priorities were given to evaluative studies (including randomized control trials, quasi-experiments), when possible, in the review and selection of the references. Considerations were given to target population, sample size, and study duration, as well as study limitations, generalizability of the findings and conclusions. As always, REL Pacific works to find and prioritize research generated in or addressing its service region for greatest relevancy to our partners.

[1] This memorandum is one in a series of quick-turnaround responses to specific questions posed by education stakeholders in the Pacific Region (American Samoa, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, Guam, Hawai'i, the Republic of the Marshall Islands, and the Republic of Palau), which is served by the Regional Educational Laboratory (REL Pacific) at McREL International. This memorandum was prepared by REL Pacific under a contract with the U.S. Department of Education's Institute of Education Sciences (IES), Contract ED-IES-17-C-0010, administered by McREL International. Its content does not necessarily reflect the views or policies of IES or the U.S. Department of Education, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.