





THE IMPORTANCE OF ERGONOMIC DESIGN

by Lisa Gibbs, EdD

Having the right tools for the job at hand is unquestionably the most efficient and effective way to execute a task and attain the desired outcome. Over time, human beings have adjusted and adapted tools in ways to maximize time and effort, minimize potential injury, and achieve optimal results.

Consider the table and chair. Stone or wood platforms—early tables—are documented to have been used in Ancient Egypt as a way to keep objects off the floor, and a type of chair has been in recorded existence since at least 3000 BC, as shown on Egyptian tomb paintings. These tools used for sitting and holding objects have evolved from simple platforms into countless varieties of tables and chairs to fit various activities.

Another evolution has been the study of how to design spaces and tools so that humans interact with them easily, safely, and effectively. This research area has been named “ergonomics.” The Merriam-Webster dictionary defines ergonomics as “an applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely.” Ergonomic design of chairs, tables, and other equipment is now an important part of health, wellness, and safety considerations on private college and university campuses.

Case Western Reserve University, Cleveland, OH

At Case Western, the office of Environmental Health and Safety includes Ergonomics as a safety area upon which to focus. As computers and laptops have become commonplace in offices and classrooms, so too have musculoskeletal problems such as carpal tunnel syndrome and trigger finger. The university uses ergonomic principles to solve such issues created by exertion, repetition, and vibration. “By adapting tasks, workstations, tools, and equipment to fit the worker, ergonomics seeks to reduce physical stress on a worker’s body and eliminate many potentially serious, disabling work-related musculoskeletal disorders (MSDs).” Reducing such stress can lead to greater productivity and overall satisfaction across campus.

The office provides guidelines for applying ergonomic principles to campus spaces. Adjustable tables, desks, and chairs can be configured at optimal height and angle

for each person. These adjustments include making sure feet can be flat on the floor, providing lumbar support for the lower back, placing keyboards so that shoulders are relaxed, and installing monitors at eye level. A workstation must be flexible enough to adapt to diverse body shapes and work styles of faculty, staff, and students.

University of Southern California, Los Angeles, CA

Similar to Case Western, the Environmental Health and Safety office at the University of Southern California (USC) considers ergonomics as a way to maximize “job function and productivity of the employee while preventing injuries.” The university accomplishes this end by researching and providing information on ergonomics, training, and regular monitoring of the work environment, tools and activities of faculty, staff, and students. Ergonomic evaluations can also be requested.

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The Merriam-Webster dictionary defines ergonomics as “an applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely.”

Arranging classrooms to maximize function and productivity is also practiced at USC. USC’s Roski School of Art and Design (Roski) received a donation to create a “makerspace”, a dedicated area where people can build together using shared tools and materials. Roski is one of the oldest art schools in Southern California and is a “unique, supportive environment for creativity, experimentation and collaboration in the visual arts and design.” The school offers a major in art or design rather than a specific medium, with the intent to allow students to explore what is relevant to them and to collaborate across disciplines. The makerspace is one concrete application of this open approach to art. After receiving a donation specifically for such a space, the school set about to find furniture that is durable, ergonomically-designed for optimal comfort, and adaptable to multi-use spaces.

After several designs were considered by the design team and faculty, the school created a flexible room with elements that support ergonomic principles. Students can draw plans

on a portable chalkboard, then use a 3-D printer to bring the plan to life. Tables are counter height, a standard three feet tall, to allow for standing and walking around design projects. Stackable bright red stools optimize space and provide flexible seating, and retractable power cords hang from the ceiling. The space is open so that students can share ideas, collaborate on projects, and work in a space suited for productivity.

Saint Louis University, St. Louis, MO

At Saint Louis University (SLU), the Reinert Center for Transformative Teaching and Learning provides instructional and curriculum development programs and services for the campus. The mission of the Reinert Center is “to develop, encourage, and sustain Saint Louis University faculty, graduate students, and academic units as they create meaningful, inclusive learning experiences that serve the intellectual, spiritual, and socio-cultural needs of all learners.” One area in which this mission

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has been put into practice is the Learning Studio in Des Peres Hall.

SLU's Division of Academic Affairs and the Reinert Center planned to design a space that would "create engaging and interactive learning experiences designed especially for today's learners." The university believes that learning spaces have moved far beyond the classic setup of rows of desks with the instructor standing in front of the students at a chalkboard or whiteboard. Optimal learning and teaching occur in spaces that are flexible, collaborative, technology-oriented, and ergonomically designed. A team of faculty, staff, and students collaborated to design such a space.

The main feature of the Learning Studio is flexibility. Each piece of furniture can be reconfigured at any time to suit the needs of the instructors and students. Lightweight, ergonomically-designed office chairs ensure that users are comfortable and supported. Portable tables can be expanded or contracted depending on the number of people to be accommodated.

The room also has tall surfaces with bar-type stools for optional seating or standing. These high tables are supported in part by lockable storage cabinets. Rolling storage bins that are open on one side and topped with cushions offer another seating area. Several lounge-type chairs and side tables provide another space that feels more like a coffee shop or living room. All furniture items can be arranged to best fit the use of the space at the time. Sliding whiteboards and a technology wall with eighteen 46" video screens provide both digital and hand-written styles of instruction.

The Learning Studio has been used for classes across many disciplines, from Public Health to Athletic Training and Biology to English. Professors apply for an Innovative Teaching Fellowship "to develop innovative instructional approaches that effectively optimize the use of the features and technologies" within the space. SLU sees this room as a pilot classroom, where innovative teaching and learning can be explored, then applied to other spaces on campus.

Ergonomic design takes into account how humans interact within workspaces and with products, attempting to minimize effort and maximize productivity. When physical spaces, furnishings and tools are mismatched or out-of-date with the purpose at hand, discomfort and possible injury can occur. Additionally, 21st century students absorb knowledge across a wide array of platforms—books, journals, laptops, tablets and pads, laboratories, studios, etc. Creating flexible spaces with an ergonomic approach enhances efficiency and safety, thus maximizing the ability to work and learn on campus.



ABOUT THE AUTHOR: PUPN staff writer Lisa Gibbs earned her EdD in Higher Education Administration in 2018. She is an advocate for arts, particularly dance, in education and for increasing the financial well-being of artists through financial education.

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