



HAWORTH®



Active Ergonomics for the Emerging Workplace

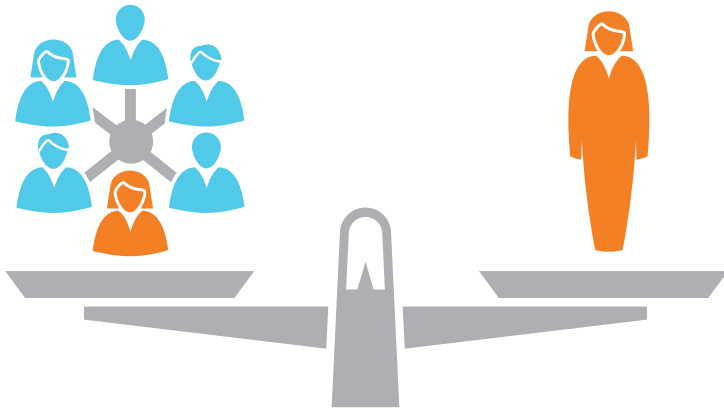
Dr. Michael O'Neill



Technology has freed people to work anywhere, which means they collaborate in a variety of spaces.

The world of work is changing—presenting an opportunity for office ergonomics to evolve as well

The goal of today's office ergonomics is focused on fitting the workspace and technology to the individual, thus reducing the risk of injuries and helping people work effectively. However, the very nature of work is changing. Technology has freed people to work anywhere, and a growing proportion of that work is collaborative and social. In response, organizations are supplementing the private office and cubicle with a wide variety of interactive group and social spaces. But traditional office ergonomics does not address group work or spaces. These emerging space types are being created with no ergonomic guidance. This situation offers a great opportunity to apply ergonomic principles broadly throughout the workplace to create safe and productive settings for both individual and group work—no matter where it may occur.



Technology and the need for collaboration drive people to work in a variety of places, using a variety of postures

For most people the work day is no longer spent heads-down at a computer in a primary workspace for eight hours. They are increasingly engaging in collaborative work that occurs within individual, group and social spaces. And, technology has freed people to work in a wider radius of locations—both within and outside the office building.

Today, collaborative work accounts for the same proportion of work time as individual computer work. It typically involves the casual exchange of ideas between a small number of individuals, in addition to larger, more formal meetings. Information is shared visually through screens of different sizes (smart phones, tablets, laptops, flat screens), whiteboards and flip charts, or other visual means. It is heavily reliant on visual access among participants, and is greatly enriched by the ability to read body language and gestures, scribble, or sketch.

Seated collaborative work may involve many quick postural changes, such as turning to hand a document to someone while seated. In a meeting, lounge, or café space with casual furnishings, the furniture and accessories need to support these movements and the use of portable technology.

Organizations that fail to apply a “big picture” approach to office ergonomics are missing the opportunity to provide a safe and high-performing workplace for their employees—regardless of the space they are using.



Activities that occur in the office environment over the course of a day: talking on the phone, writing notes, looking up data in a reference document, working on the computer, informal problem solving with a colleague, project team meetings, blended social/work interactions at the company cafe, working in a casual lounge area, etc.

Active Ergonomics extends good ergonomic principles to the entire workplace

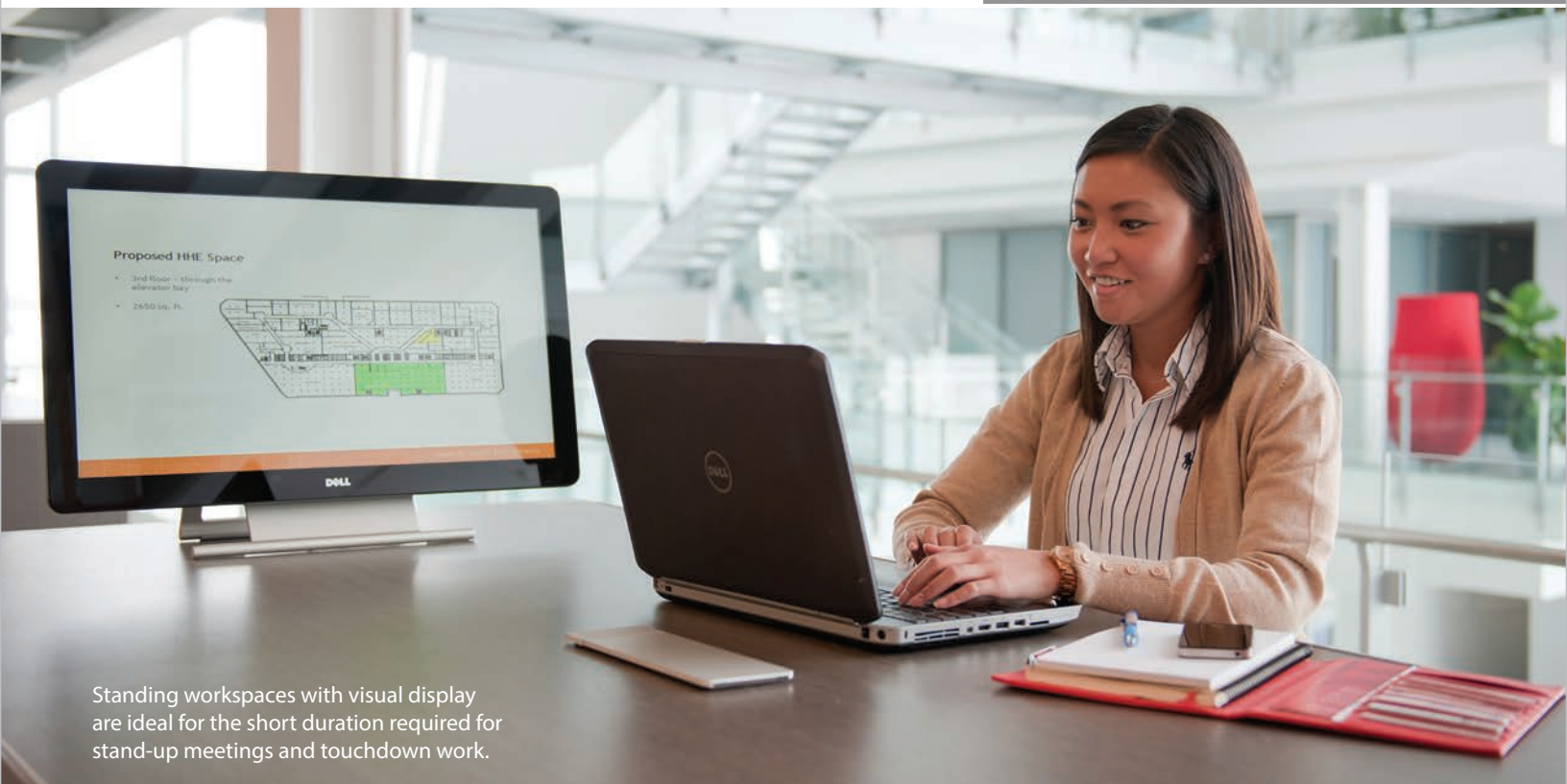
The scope of traditional office ergonomics is limited to individual work within the primary workspace. Active Ergonomics is a new approach in which good ergonomic principles are applied to all elements of workplace planning, group and individual workspaces, furnishings, and technology. It builds on a foundation of thinking about the need to expand the scope of ergonomics.^{1, 2, 3, 4} Active Ergonomics offers organizations the opportunity to better support the health and performance of their employees—regardless of their work location.

In the following sections, we offer examples of how to apply Active Ergonomics principles to both the planning of workspace, and for group spaces and their furnishings.



The office workspace is evolving from a heads-down environment to one that highlights a collaborative, social context for work—and offers choice and flexibility.⁵

- Gensler, 2012



Standing workspaces with visual display are ideal for the short duration required for stand-up meetings and touchdown work.

1 Hendrick and Kleiner, 2002

2 Wilson, 2000

3 Taylor and Felten, 1993

4 O'Neill, 2007

5 Arieff, 2012

“Legibility” is key to Active Ergonomics in space planning

Legibility is related to how easily people can understand, and navigate, the interior layout of a building, and effectively understand the intended use of all the workspaces within.

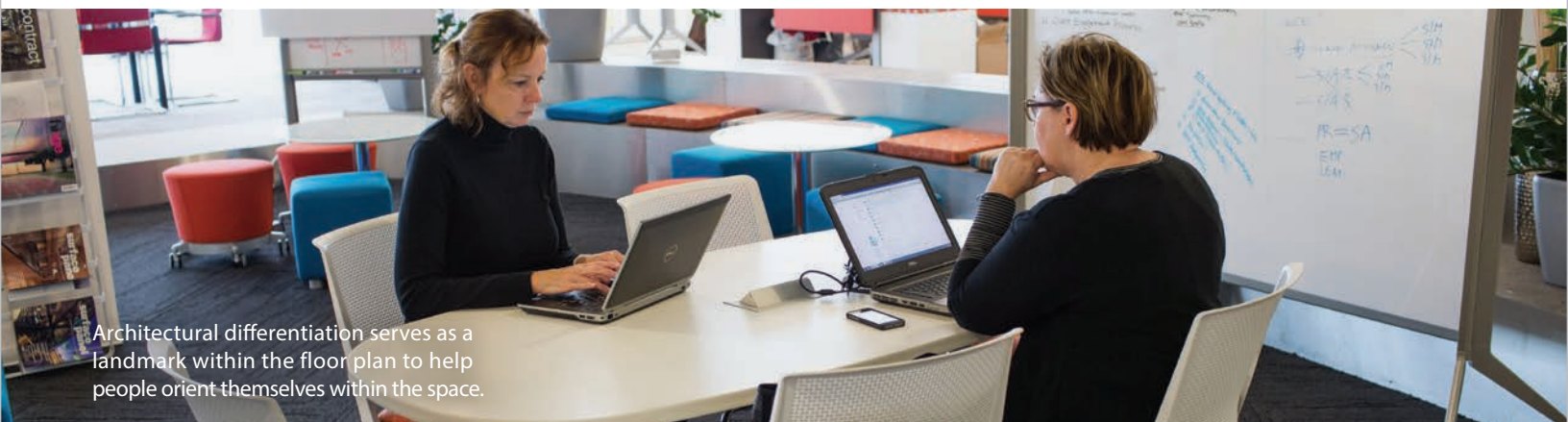
Legibility is a fundamental part of Active Ergonomics because it puts people’s needs first—it is intended to create a positive work experience that makes it easy to locate the type of space needed, and quickly and effectively use each space type.

The layout of a legible office space is clearly organized. People can easily create a “mental map” of the layout and find any location within the building, even with limited experience within the space.⁶ In terms of design, the layout of the office should set up a predictable rhythm that makes it easy for people to learn, or guess, where a desired space type might be found.

Conversely, a “cube farm,” where the floor plan is laid out with monotonous regularity and every location looks the same, forms a disorienting maze. Complex “illegible” layouts can suppress desirable movement of workers between workspaces, increase wasted time, and reduce overall sense of control in people. If the intended use of a space and its technology is ambiguous (such as café spaces, lounge areas, etc.) people will avoid using them or waste time trying to figure out how to use the space and furnishings.

Poor legibility of floor plan and spaces has been linked to negative health impacts.⁷

The purpose of an Active Ergonomics approach is to create successful *workplaces*, not just successful *workspaces*.



Architectural differentiation serves as a landmark within the floor plan to help people orient themselves within the space.

⁶ Weisman, 1981

⁷ Garling and Evans, 1991

The overall “legibility” of the space can be improved by five design elements

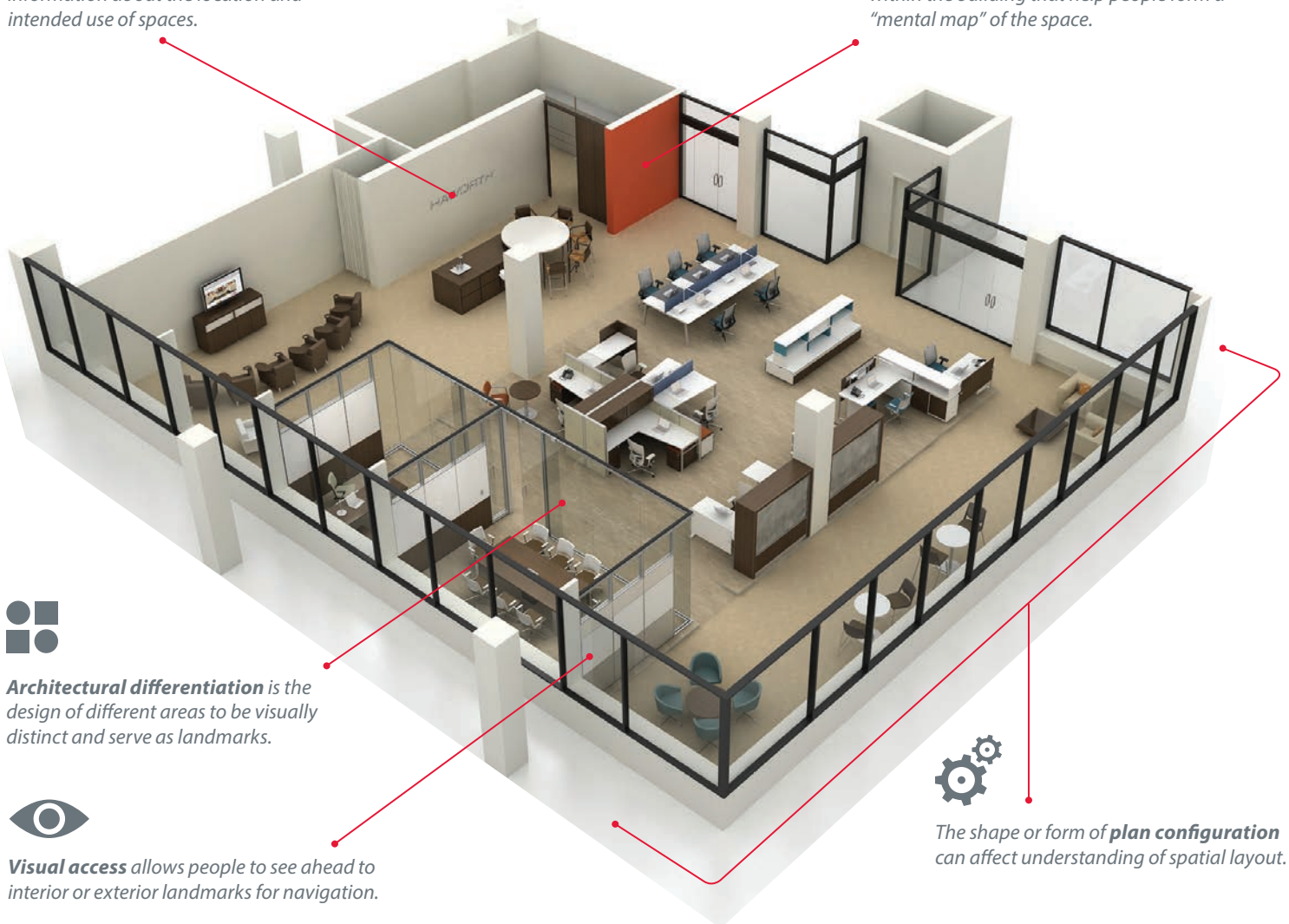
Legibility can be “designed in” to the office space by offering a floor plan layout that is easy to understand and learn, landmarks that help people orient themselves, visual access within the space and outside to landmarks, and signage that guides people with information about the intention and use of the space.⁸



Signage or graphics can provide information about the location and intended use of spaces.



Landmarks are obvious physical elements within the building that help people form a “mental map” of the space.



Architectural differentiation is the design of different areas to be visually distinct and serve as landmarks.



Visual access allows people to see ahead to interior or exterior landmarks for navigation.



The shape or form of **plan configuration** can affect understanding of spatial layout.

⁸ O'Neill, 1999

Active Ergonomic principles can be applied to the design of group and social spaces, and their furnishings

Most organizations offer a variety of spaces to facilitate the collaborative work and social interactions that occur throughout the workplace.⁹ Following are some general tips for specifying ergonomic furnishings in group spaces.

1. **Lounge spaces and their furnishings are not intended to be an “all day” work environment.** While these furnishings can support individual work, they are typically intended for group interaction and should be furnished and designed to facilitate safe postures during collaboration. In addition, the spatial relationships between furniture elements should not cause unsafe postures when people are interacting (for instance, leaning too low or too far forward while talking or sharing a display device).
2. **Use furniture elements that provide access to power and data modules** within group and social spaces. Power modules should be located to accommodate the typically short cord lengths of devices so people do not assume unsafe postures (e.g., bending, stooping) when plugging in.
3. **Use height adjustable tables whenever possible in collaborative meeting spaces.** Standing height meetings tend to be shorter in duration and provide people time a break from prolonged seated postures.¹⁰ Consider providing a foot rail for fixed standing-height tables.
4. **Lounge furniture (couch, casual seating) can support safe ergonomic postures** for people using devices such as laptops and tablets.¹¹ Select furniture with firm seat and back cushions, preferably with soft, wide armrests. Offer support pillows so users can adjust for seat depth and lumbar support, and for arm support when seated in the middle of a couch, and when holding a tablet or other device.



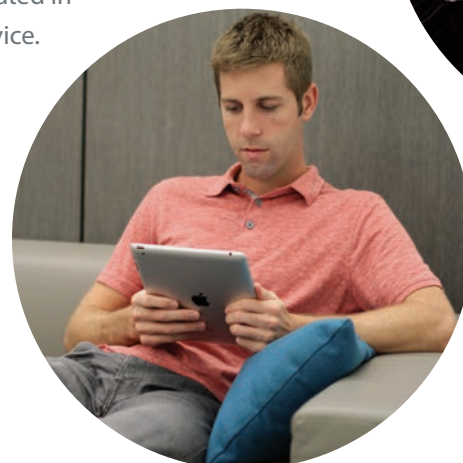
1



2




3



4

9 O'Neill, 2010
10 Vlahos, 2011

11 Gold, et al, 2012




To drive innovation, people need to interact in different ways throughout the work day, using a variety of group spaces.

Active Ergonomics broadens the benefits of healthy productive workspace to include the *entire* work environment

Office work has fundamentally changed. For most people, the days of continuous heads-down work in a cubicle are a thing of the past. The daily work experience is now inseparable from technology use, and includes individual, group, and social interactions that occur in a widening range of space types. However, the scope of traditional office ergonomics is limited to individual work in the primary workspace.

The Active Ergonomics approach includes all work environments where social, interactive, and focused work is conducted. Active Ergonomics broadens the scope of influence of good ergonomics principles to the entire workplace—not just the primary workspace. It can help organizations create an overall environment that reduces health risks and increases the performance of people—wherever they may be working.



People no longer spend all day in a cubicle. Heads-down work happens anywhere.

References

- Arieff, Allison (2012). Workplace revolution 2.0, in Dialogue Magazine 22, A Gensler publication.
- Garling, T. and Evans, G. (Eds.) (1991) Environment, Cognition and Action: An Integrated Approach. New York, NY: Oxford Press.
- Gold, J., Driban, J., Yingling, V. and Komaroff, E. (2012). Characterization of Posture and Comfort in Laptop Users in Non-Desk Settings. Applied Ergonomics, 43, Elsevier Science Ltd.
- Hendrick, H. and B. Kleiner (Eds.) (2002). Macroergonomics: Theory, Methods, and Applications. Lawrence Erlbaum Associates, New York, NY.
- O'Neill, M. (1999). Theory and Research in design of 'You Are Here' maps. In: H. Zwarg, Boersema, T, and Hoonhut, H. (Eds.), Visual information for everyday use: Design and research perspectives. Taylor & Francis, New York, NY.
- O'Neill, M. (2007). Measuring Workplace Performance. Taylor & Francis, New York, NY.
- O'Neill, M. (2010). A model of environmental control and effective work. Facilities, Vol. 28, No. 3/4, London: Emerald Group Publishing Limited.
- Taylor, James C., and David F. Felten. (1993). Performance by design: Sociotechnical systems in North America. Englewood Cliffs, N.J.: Prentice Hall.
- Vlahos, J., "Is Sitting a Lethal Activity?" The New York Times, April 4, 2011 (<http://www.nytimes.com/2011/04/17/magazine/mag-17sitting-t>).
- Weisman, J. (1981). Evaluating architectural legibility. Environment & Behavior, 13, 189-204.
- Wilson, J. (2000). Fundamentals of ergonomics in theory and practice. Applied Ergonomics, 31, 557-567, Elsevier Science Ltd.

Haworth research investigates links between workspace design and human behavior, health and performance, and the quality of the user experience. We share and apply what we learn to inform product development and help our customers shape their work environments. To learn more about this topic or other research resources Haworth can provide, visit www.haworth.com.

Author's Bio



As Senior Research Strategist for Haworth, Dr. Mike O'Neill conducts research projects with leading companies to assess how workspace

design affects employee performance and health. Previously, as a professor of interior design and industrial engineering at the University of Wisconsin, he taught and conducted workplace ergonomics research.

O'Neill is the author of several books, including Ergonomic Design for Organizational Effectiveness (1998), and Measuring Workplace Performance (2007). He is a co-author of the ANSI/HFES 100-2007 workstation standards and is a member of the current ANSI/HFES 100 Workstation Standards revision committee. In 1993, Michael was an early recipient of the Board Certified Professional Ergonomist (CPE) designation.