Heads Up/Heads Down: A Pattern Language for Fostering Thinking in the Workplace

Jill Blass

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HEADS UP/HEADS DOWN: A PATTERN LANGUAGE FOR FOSTERING
THINKING IN THE WORKPLACE

by

JILL BLASS

Under the Direction of Michael White, Sr., AIA, IDEC

ABSTRACT

Heads Up/Heads Down: A Pattern Language for Fostering Thinking in the Workplace is
a handbook presenting architectural design strategies for how to best support thinking in the
workplace. It follows the concept of a pattern language, a theory originated by architect
Christopher Alexander in his 1977 book A Pattern Language: Towns, Buildings, Construction,
where each pattern describes a problem and offers a generic solution that can be customized to
suit the reader’s project. While Alexander uses experience to inform his patterns, my work is
generated from current scientific and social science research. Alexander’s work spans scales,
from the organization of cities down to the thickness of an interior wall, while my work focuses
solely on the interior scale in the context of an office. My goal is to add upon Alexander’s vast
work by narrowing down the patterns to address the modern workplace and its demand for creative knowledge work.

INDEX WORDS: Interior design, Workplace design, Human-centered design, A pattern language, pattern language, Christopher alexander, displayed thinking, Open-plan office, Focused work, Concentration, Knowledge work, Industrial revolution, Ernest g. welch, Georgia state university, The burren college of art, Thinking, Wiki
HEADS UP/HEADS DOWN: A PATTERN LANGUAGE FOR FOSTERING THINKING IN THE WORKPLACE

by

JILL BLASS

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Fine Arts

in the College of the Arts

Georgia State University

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DEDICATION

For Ernest G. Welch, who earned his bachelor of fine arts degree in photography at Georgia State University when he was 93 years old and to all the other lifelong learners, thinkers, and creators out there.
ACKNOWLEDGEMENTS

This thesis was born from insights gained from faculty at Georgia State University. Thanks to Dr. Dawn Haynie for sharing your expertise in spatial organization, Michael White for encouraging me to pursue my idea of “thesis as toolkit” and for suggesting I take a look at *A Pattern Language*, Ryan Crooks for teaching me about architectural awareness in the moment, Jeff Boortz for showing me how to convey complex design strategies in an accessible manner, Carrie Wallace Brown for introducing me to tactical urbanism and the idea of a designer’s toolkit and Craig Drennan for teaching me about academic writing.
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1 INTRODUCTION

“Providing time, space, and inspiration” is the founding motto of the Burren College of Art (BCA) located on the northwest coast of County Clare, Ireland. Georgia State University, through generous funding from benefactor Ernest G. Welch, flew me and nine other class of 2020 Master of Fine Arts candidates to an all-expense paid, two-week residency in this charming, fairy-tale of a place (complete with its own castle), where sheep outnumber people. Time, space, and inspiration were provided in spades. We had the freedom to walk around the charming, limestone cladded campus with its vast, green pastures and picturesque views of the rugged karst landscape. We had uninterrupted time to work in the wood/stone/metal workshop, printmaking studio, darkroom/photographic studio, digital lab, and library.

For me, the best amenity was my individual, semi-private workspace. Like an overjoyed kid that no longer has to share a bedroom, this was my first GSU experience in having my own

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1 www.burrencollege.ie/about-us/
2 Evans, Odile
workspace. The graduate design studio in Atlanta looks like a large storage closet for unused equipment and supplies. There's just enough room for a shared conference table that functions as an eating space and shared computers on narrow tables hugging the side walls. It’s windowless, cramped, cluttered, loud with breakroom talk, and not conducive to deep thinking. Conversely, at BCA, my glorious workspace provided a place of my own, where I could read, think, and create.

My days at BCA usually began with a solitary, peaceful walk to campus. I’d walk a block along the main country road and say hello to the pair of donkeys in the marsh. Once I passed the thatched cottages on the right, I’d turn down a gravel road and walk a short distance to a horse paddock near an elementary school’s soccer field. Then I’d climb over a low limestone wall, marked as the Wood Loop Trail to enter a hazelnut thicket. The grassy thicket opens up to a clearing with deeply grooved limestone. The rocky terrain would again transition back to being grass covered and provide a pasture for the herd of grazing sheep. I’d say hello to the sheep and continue to hike through the pasture. I’d walk towards Newton Castle, a 16th-century tower house that marked the entrance to the school.

Figure 2 Ballyvaughan Wood Loop Sign.
Photo from Tripadvisor.com
While sitting at a desk in my workspace at the Burren College of Art, I had the opportunity to reflect on my experiences at the college and think about the qualities that make this geographic area so special. With a pen and markers, I drew a series of postcards, mainly landscapes that tried to capture the sense of place of the Burren. Its great natural beauty and history seems magical and irreproducible, but I am hopeful that some of the “magic” of the place, specifically the inspiring workspaces at the school, can be deconstructed and understood.

![The Burren](image)

*Figure 3 Jill Blass. Greetings from The Burren. Postcard series mailed from Ireland in June 2019*

Recently, I’ve read several sources about how to design comfortable workspaces that facilitate thinking. I found architect and architectural theorist Christopher Alexander’s *A Pattern Language* and environmental/design psychologist Sally Augustin’s book *Place Advantage*:
Applied Psychology for Interior Architecture to be especially helpful. Instead of focusing on what Will Wright calls “the artistry of the form,” both authors have more of an anthropological approach where spatial design comes from an investigation of how humans interact with each other and with one’s space. Alexander and his co-authors used their combined 28 years of experience and architectural practice to guide their recommendations in A Pattern Language, published in 1977. This contrasts with Place Advantage, where Augustin uses contemporary scientific research conducted by psychologists, biologists, physicists and social research from anthropologists, sociologists, and designers to inform her recommendations. In my readings, I discovered that the artist workspaces at BCA fulfill many of the recommendations.

My workspace had the same dimensions and layout as the other workspaces. Each one has a spacious 13’ x 13’ square footprint. Alexander advises at least a 60 square foot workspace and Augustin mentions that a square shaped footprint is what people most prefer. Each workspace is bordered on three sides with tall drywall partitions. While not the thick wall that Alexander advises placing behind where one sits, the tall height gives the worker (or artist) visual and acoustical privacy. The three walls with an open side along the circulation path give a clear delineation of one’s territory and fulfill Alexander’s recommendation that 50% to 75% of the space is enclosed, while being open enough to see people approaching and able to talk to the coworker in the workspace across. Alexander recommends being able to see 3-8 other workers.

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3 “Will Wright Interview”
4 Alexander
5 Augustin
6 Alexander
7 Augustin, p. 202. Partitions between workspaces need to be a minimum of 60 inches tall to provide visual screening and 64-66 inches tall to provide acoustic shielding.
8 Alexander
Worrying about inadvertent eye contact was a non-issue, as there is no one sitting opposite and facing you. There are many comfortable focal lengths. The desk has more than the recommended 8’ of space in front of you to rest your eyes. There are longer focal lengths available when you look across to your coworker’s space. Augustin recommends that one have a view of at least 15-20 feet while sitting in a comfortable seat.

There are tall ceiling heights, which research has shown promotes abstract thinking and more open thinking (lower ceilings are correlated with thoughts about details and specifics). Daylight is maximized as the partitions don’t reach the ceiling and allow sunlight coming in from skylights to penetrate the space. Increased productivity, improved learning, happiness, and general well-being is associated with natural sunlight.

There is a comfortable density of two rows of five workspaces. The workspaces at the beginning of the circulation path offer a feeling of refuge as they look out upon the larger gallery space. Workspaces near the end have a view of nature. There is a large window with a view out to the meadow. Cows come right up to the window and peer in. Environmental psychologist, Rachel Kaplan has studied people’s responses to viewing nature when at the workplace. Factors that influence productivity, like motivation, job productivity, and well-being all increase when people view nature.

“Displayed thinking”, where sketches and ideas on paper are posted as they come up during the process of creating, facilitates creative thinking. The gallery walls and the pin-up walls in the individual workspaces provide areas of displayed thinking. At BCA, the entire

\[ \text{References:} \]
\[ 9 \text{ Alexander} \]
\[ 10 \text{ Augustin} \]
\[ 11 \text{ Meyers-Levy and Zhu} \]
\[ 12 \text{ Augustin, p.188} \]
\[ 13 \text{ Augustin, p.191} \]
\[ 14 \text{ Kaplan, p.193} \]
creative process is on display from inspirational images and preliminary sketches to the finished work. All these pinned up ideas show the body of work and allow for a collaborative, open sharing of ideas. It helps viewers better understand the work and facilitates a contribution of input and shared ideas. The displayed work also may inspire others in their own work.

BCA’s verbal promise of offering “time, space, and inspiration” is strongly supported by its physical space. Augustin writes about how physical messages conveyed in the built environment must match verbal messages. She writes, “For an organization to be successful, the enduring statements made by a workplace and workspace design must be consistent with the group’s organizational culture.”\textsuperscript{15} This matching of statements makes BCA a truly creative place.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{workspace.png}
\caption{Workspace at the Burren College of Art}
\end{figure}

Retrieved from burrencollege.ie/facilities
\textsuperscript{15} Augustin, p. 184
1.1 Why thinking spaces?

Questioning, quietly thinking, and solving problems is the core of who I am. I have a pensive, analytical personality characterized by the Myers-Briggs INTP personality type, called “The Logician” or “The Architect”. Personally, I believe that there isn’t enough critical thinking happening in the world and I believe design can help alleviate this problem. I want to learn more about how to design spaces for thinking and share this information with others, especially to improve thinking while in the workplace, where people spend the bulk of their lives.

The ability to think at work is of growing importance as the workplace is becoming more knowledge based and is placing an increased value on creativity and innovation. Complex problem solving, critical thinking, and creativity are the top three skills needed in the 2020 workplace according to the World Economic Forum and its *Future of Jobs Report*.16 I’d like employees to be able to access their full thinking potential. Susan Cain in her book, *Quiet: The Power of Introverts in a World That Can’t Stop Talking*, talks about how human potential is often wasted in the contemporary workplace. She says exceptional performance requires the right working conditions.17 The aim of this thesis is to promote information on how to create these right working conditions.

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16 “Future of Jobs Report”
17 Cain, p.83
1.2 Why A Pattern Language?

It’s been more than twenty years since I last thought about Christopher Alexander and his 1977 book, *A Pattern Language: Towns, Buildings, Construction*. I was first introduced to his theories in Dr. Jo Hassell’s Theory of Interior Architecture class at the University of Florida. My distant memory of her lecture was that Alexander discussed good design in terms of human rights. To my twenty-something-year-old self, this was a groundbreaking idea. I had previously considered design as a luxury or a commodity that was unfortunately limited to a few, not as a universal right.

Professor Hassell talked about how in one of Alexander’s patterns “Access to Water,” that since there is a natural human attraction to water, everyone should have the ability to experience the beach. Previously, I just accepted the common practice in Florida of beaches being privately owned. When I thought about it, it did seem unjust that one person could claim ownership of the ocean's edge and forbid another’s access to it. In his book, Alexander
recommends that private development can occur close to the water, as there is a natural desire to do so, but the land right at the water’s edge must be preserved for common use.

Christopher Alexander and *A Pattern Language* recently was brought to my attention again when I met with my committee chair Professor Michael White to discuss my goal for this thesis. I explained that I wanted to present usable, practical information about how to better design workplaces, specifically places for thinking. I didn’t want to write a dense, highly specific or highly personal paper that would have little interest to other people. I wanted to provide easy to understand tips and strategies that could be quickly read, absorbed, and hopefully used by my audience. He mentioned a previous student’s thesis where she diagrammed how one’s national culture, Indian compared to American, changed one’s perception of the workplace. He also suggested that I take a look at *A Pattern Language*. 

*Figure 6 Christopher Alexander, “Access to Water”, p.136-137*  
*A Pattern Language*
2 WHAT IS A PATTERN LANGUAGE?

About the same dimensions of a Bible, 5 ½ inches wide by 8 inches tall and 1 ¾ inches thick, *A Pattern Language* is dense with over 1,000 pages attempting to address the entire built environment from the organization of cities down to the thickness of a wall. There are 253 discrete patterns that describe the way humans respond to aspects of the physical environment. Each pattern describes a timeless reoccurring problem and fundamental solutions that can be used, “in such a way that you can use this solution a million times over, without ever doing it the same way twice.” The solution is presented in a basic, generic way so the reader can personalize it to fit one’s preference, site condition, etc.  

Seen as a living, growing thing, by its authors, *A Pattern Language* networks its entries through references to each other and are intended to be built upon each other, hence the term “language”. Originally intended to be published in a three ring binder where pages could be edited and added on, the authors consider the book as continually evolving where readers are encouraged to edit the patterns and develop new patterns to contribute.

When writing this thesis, I was initially worried about seeming pretentious for wanting to contribute my ideas about workplace design to this historic, weighty tome. The requirements of the workplace have changed a lot since the book’s publication in 1977 and I believe the book needs updating. I was relieved to read that this kind of user revision was the authors’ intention. This do-it-yourself spirit in updating the patterns is also seen in the book’s central aim to lay out a theory that can empower all people to create well-functioning environments for themselves.

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18 Alexander, p. x
2.1 Lineage

*A Pattern Language* has ideas that originated in Christopher Alexander’s doctoral thesis at Harvard (where he received Harvard’s first architecture Ph.D.). His thesis *Notes on the Synthesis of Form* (1964) was published as a book in 1977 and won the American Institute of Architects Gold Medal. This was the first time a work of research was awarded.\(^{19}\)

In his thesis, he talks about his belief that traditional societies, and their use of time-tested building forms, that have minor adaptations depending on circumstance, are more inherently beautiful than contemporary architecture where form is derived from abstract concepts and formal rules. He describes contemporary architecture as centering “upon a single design episode, creating an outcome where the ‘forces’ are unbalanced.”\(^{20}\) He tries to solve this problem by applying a complex mathematical method\(^{21}\) to the “forces” acting in a design. When put into practice, he found that this process was too cumbersome and demanding. Alexander then focused on particular groups of forces that created generic situations that occur repeatedly in the built environment. Resolving these forces resulted in generic solutions that could be modified into an infinite variety of specific circumstances.\(^{22}\) This concept of generic problems and solutions became “patterns” in his “second theory”.\(^{23}\)

Alexander’s “second theory of architecture” applies to his trilogy of books, *The Timeless Way of Building* (Alexander 1979), *A Pattern Language* (Alexander et al. 1977), and *The Oregon Experiment* (Alexander et al. 1975). *A Pattern Language* is intended to be the second half of one book, with *The Timeless Way of Building* as the first part, where he criticizes modern

\(^{19}\) Rybczynski
\(^{20}\) Dawes and Ostwald, p. 2
\(^{21}\) Before attending Harvard for his Ph.D., he studied mathematics and architecture at Cambridge University, United Kingdom
\(^{22}\) Grabow
\(^{23}\) Grabow
construction methods and contemporary architecture. *The Timeless Way of Building* describes the theory of pattern language and how to use the language. *A Pattern Language*, provides the actual language and the authors see it as a “sourcebook”. Alexander is the sole author of *The Timeless Way of Building*. In *A Pattern Language*, Authors Sara Ishikawa, and Murray Silverstein joined Alexander in the writing of the book with additional writing credit to Max Jacobson, Ingrid Fiksdahl-King, and Schlomo Angel.²⁴

![Image of an open book showing pages from *A Pattern Language*](image)

*Figure 7 Christopher Alexander, A Pattern Language: Towns, Buildings, Construction*

### 2.2 Components

Each pattern has the same format. The entries are numbered in ascending order from 1 to 253, and discuss a topic from large scale to small, for example, 1. INDEPENDENT REGIONS to 253. THINGS FROM YOUR LIFE. The title can name the thing created by the pattern, i.e.

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²⁴ This was his team at the Center for Environmental Structure that he established in Berkeley, California.
241. SEAT SPOTS, the process of creating a pattern, i.e. 30. ACTIVITY NODES, or some attribute of the solution, i.e. 25. ACCESS TO WATER.

Following the title, there is an asterisk system where 0-2 asterisks denote the certainty of the pattern. No asterisks mean that the hypothesis is still being tested and is uncertain, while 2 asterisks denotes more certainty. All the entries are considered a work in progress with each pattern being a testable hypothesis. The authors wanted the theory to be added onto and improved upon. The hope was that *A Pattern language* would become a common language that is shared by everyone.

The title is followed by a picture that illustrates the problem, usually a photograph. Then there is a description of the context, a problem statement in bold, longer text with examples and explanations, and a solution statement in bold preceded by the word “therefore”. There is a sketch of the solution. The last paragraph talks about other entries that are related and how the patterns are interconnected.

In the introduction, the authors comment of this interconnectivity,

This is the fundamental view of the world. It says that when you build a thing you cannot merely build that thing in isolation, but must also repair the world around it, and within it, so that the larger world at that one place becomes more coherent, and more whole; and the thing which you make takes its place in the web of nature, as you make it.\(^{25}\)

\(^{25}\) Alexander, p.xiii
Figure 8 Components of Alexander’s Pattern Language

2.3 Examples of workplace patterns

A Pattern Language has a few entries describing office design such as SELF-GOVERNING WORKSHOPS AND OFFICES (pattern number 80), OFFICE CONNECTIONS (82), and FLEXIBLE OFFICE SPACE (146). In “Self-governing Workshops and Offices,” Alexander writes about how the enjoyment of work is fundamental to one’s life. Work should be organized in a way that brings meaning, fulfillment, and development to an individual. He references the Buddhist point of view where to not do so would be, “…short of criminal, indicating a greater concern with goods than with people.” 26 He states that “no one enjoys his work if he is a cog in a machine.” He says people need their workplace to be at a human scale

26 p.399
and in a setting where employees have a say. He recommends a pattern where workgroups are organized into self-governing, autonomous groups, with 5 to 20 workers, housed in a building of their own. This pattern is less relevant today as automation has begun to replace menial tasks. Today there is more of a need for human knowledge of operating and maintaining robots instead of performing repetitive, manual labor and being a “cog in a machine.”

In “Office Connections,” the distance between parts of an office and the effect of travelling that distance is discussed. He counters the Taylorian concept where stations with frequent movement should be placed closest together, so there is less “wasteful” walking. Instead he recommends that walking is “good for the body,” as long the distance doesn’t reach what he calculates as a “nuisance distance.” This pattern is still relevant today, but doesn’t go into enough depth about the benefits of walking on thinking and creative problem solving, skills required in today’s workplace.

Alexander acknowledges that both “Self-governing office” and “Office Connection” are global patterns that don’t yet give concrete detail about how to design and build. In “Flexible Office Space” he does begin to talk about how to shape and physically construct an office. He recommends that when starting with an open floor plan, install two rows of evenly spaced columns. This will organize the space into a central aisle with the potential for flanking bays on each side. Employees can later add partitions to the columns as the need arises.

\[\text{References}\]

27 P. 401  
28 P. 399  
29 P. 402  
30 P. 403  
31 Alexander, p. 408  
32 P. 409  
33 P. 693
Alexander’s workplace patterns are still relevant today, but do not delve into how the attributes of a space can affect one’s ability to think. The nature of work has changed a lot since the 1970s. Today’s workplace has a greater demand for knowledge work where one must “think for a living”. In addition to “heads down”, linear, convergent thinking, employees must be able to think creatively and expansively in a “heads up” manner to effectively solve problems. My thesis aims to address the modern workplace with its emphasis on thinking. My method of using Augustin’s recommendations (based on current research) and formatting this information into a pattern language will allow the new patterns to “speak to,” integrate, and build upon Alexander’s. This is in line with his original intent that A Pattern Language be a “living” and flexible thing, where readers are invited to edit and add upon his book, similar to how Wikipedia is set up today.

2.4 Work that it has inspired

Two things surprised me while researching Christopher Alexander and A Pattern Language. I was surprised to learn at how far reaching of an impact it has made on seemingly diverse areas of contemporary society and how despite its mass popularity, it is rarely taught in architecture schools. It is one of the best-selling architecture books of all time. Today, forty-two years after it was published, it has an Amazon Best Sellers rank of #2 in Architectural Criticism, #2 in Urban & Land Use Planning (Books), and #3 in Architecture (Books).34 William Saunders, former editor of Harvard Design Magazine, says “A Pattern Language could very well be the most read architectural treatise of all time, yet in architecture schools I know, it is as if this book did not exist.”35 His statement concurs with my specific academic experience. Other than the one

34 Amazon retrieved 11/25/2019
35 Saunders, William
mention in Dr. Jo Hassell’s theory of interior architecture class, this book was not mentioned in any of my architecture classes or graduate design coursework.

A variety of people such as computer scientists in software design, city planners in the New Urbanism movement, and DIY home builders have been inspired by *A Pattern Language*. In an article titled, *Wiki as Pattern Language*, Ward Cunningham, the original developer of wiki, a knowledge based website where users collaboratively update content, and Michael W. Mehaffy, an architectural theorist and colleague of Cristopher Alexander talk about how *A Pattern Language* inspired the creation of “pattern languages” also called “design patterns” in software design. These software design patterns then informed the creation of wiki, websites that allows visitors to make contributions, with Wikipedia being the best known.

Pattern language also inspired the creation of the computer game *The Sims*. Will Wright, the creator of *SimCity* and *The Sims* tells *Icon Magazine*, “SimCity was actually originally inspired by Chris Alexander, and going back and looking at design in general I’ve found a lot of inspiration from Charles and Ray Eames, Jay Forrester, Jane Jacobs, all the people who are sort of spanning the division between design, theorist, and a specific field – you know, urban design, architecture or whatever. I find that triangle really interesting to draw inspiration from.” When asked “How have these ideas manifested themselves in your games?” he replies:

Chris Alexander I find particularly interesting because he was writing about architecture, but not in terms of form – a lot of architecture is totally stuck on the artistry of the form, what the form of the building conveys emotionally and all that, and in some senses I think that architecture has run off the beaten track (in focusing on form) when really what their job is to design spaces for human

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36 Cunningham et al.
37 “Will Wright Interview”
interaction. And Christopher Alexander approached the whole thing much more like an anthropologist and he would go and study culture and understand what people spend their time doing, and in what sized groups, and what they need around them to facilitate that activity, and then design from the ground up from there, so rather than starting with the abstract form, what is the artistic statement we are making with this building, he would say what is the human interaction I’m trying to facilitate with this structure, and so *The Sims* really started out as an architectural game – you were designing a house and then the people were the scoring system. They came in and you were looking at how happy they were and how efficiently your house met their needs. In *SimCity*, in a similar way but on a larger scale, you were designing this layout to facilitate certain forms of human interaction, so really design is serving human interaction at the end of the day. That’s the point of pure design. And I really wanted to put the player, in both games, in that role of designer, where you design something, and then the simulation takes over and shows you the fitness of that design.38

*SimCity* is used as a teaching tool. Barbara Porado in an article in *ArchDaily* writes, “The new *SimCity* is subtly teaching its players the pros and cons of serious, real-life issues such as renewable energy, preservation of natural resources and cooperation between neighboring cities - all within an entertaining virtual interface whose fate rests at your fingertips.”39 Last semester when sophomore GSU undergrads were asked “What inspired you to pursue an interior design education?” An interest and background in art was the most common response. I was surprised to

38 “Will Wright Interview”
39 Porado, Barbara
hear that playing *SimCity* was the second most popular response. Sophomore Karhtat Wallace is an avid player and even used the *SimCity* interface to model her ideas for a class project.

![Image](image.png)

*Figure 9 Karhtat Wallace, GSU student, where she used SimCity’s interface.*

*A Pattern Language* has influenced the New Urbanism movement with its ideas and its form. Andres Duany and Jeff Speck’s 2009 *The Smart Growth Manual* consists of 148 patterns where new places are built upon observations of existing places that work. Another example, *Ideo’s Method Cards* represent the "diverse ways that design teams can understand the people they are designing for". Each card has a title, a picture example, a section on how you would use the method and why you would use the method, and specific examples.

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40 Duany, et al.
THE RISE OF THE OPEN-PLAN OFFICE

The open-plan office is the most popular office design.\(^{41}\) 68% of people work in an office with low or no walls according to a 2010 study by the International Facility Management Association. Unfortunately, it is also the most hated type of workspace and is correlated with higher job dissatisfaction, increased sick leave, employee turnover, loss of productivity, and low performance.\(^{42,43}\) Open-plan offices are loud, distracting, and offer little privacy.\(^{44}\)

In terms of thinking, open plan workspaces hinder one’s ability to focus and concentrate. While having little impact on repetitive work, the presence of noise and interruptions are concentration killers when performing knowledge work. Libby Sander, an

\(^{41}\) Brill et al.  
\(^{42}\) Schwab  
\(^{43}\) Augustin  
\(^{44}\) Schwab
assistant professor of organization behavior at Bond University writes, “Knowledge work requires employees to attend to specific tasks by gathering, analyzing, and making decisions using multiple sources of information. When any of these cognitive processes are interrupted, inefficiency and mistakes increase.”

Noise, interruptions and seeing people moving around result in decreased ability to concentrate. "The detection of changes in the visual stimulation results in distraction of cognitive processing," according to the journal *NeuroReport*.

Freedom from interruptions was a major factor in DeMarco and Lister’s *Coding War Games*, a software programming/coding competition that had unexpected results. Factors such as a programmer’s years of experience, salary range, and time spent completing the work did not predict success at completing the task. Susan Cain in her book *Quiet* writes,

> It was a mystery with one intriguing clue: programmers from the same companies performed at more or less the same level, even though they hadn’t worked together. That’s because top performers overwhelmingly worked for companies that gave their workers the most privacy, personal space, control over their physical environments, and freedom from interruption. 62% of the best performers said that their workspace was acceptably private, compared to only 19% of the worst performers; 76% of the worst performers but only 38% of the top performers said that people often interrupted them needlessly.

Supporting quiet work is one of the two top productivity enhancers and job satisfiers. However, two-thirds of those in open offices (the most prevalent workspace type) are “often

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45 Sander
46 Berti and Schöger
47 Cain, p. 84
distracted by others’ conversations” and can’t do focused work. Author and journalist Geoffrey James calls this a “productivity disaster”. He says, “Open-plan offices are the management equivalent of climate change denial. No amount of scientific truth is going to extract proponents from their willful stupidity”.48

3.1 The New Groupthink

The New Groupthink is a term coined by Susan Cain in her book *Quiet: the Power of Introverts in a World that Can’t Stop Talking*, where teamwork is elevated above all else. She also describes it in her New York Times article, *The Rise of the New Groupthink*, where she says:

> Our companies, our schools and our culture are in thrall to an idea I call the New Groupthink, which holds that creativity and achievement come from an oddly gregarious place. Most of us now work in teams, in offices without walls, for managers who prize people skills above all. Lone geniuses are out. Collaboration is in.49

It is a myth that open plan offices increase collaboration and innovation. Open-plan offices actually decrease face to face communication. A Harvard Business School study in 2018 showed 73% less time in person conversations while online conversations (email and messaging) increased over 76%.50 Group work diminishes creativity. Organizational psychologist Adrian Furnham says, “…evidence from science suggests that business people must be insane to use brainstorming groups. If you have talented and motivated people, they should be encouraged to work alone when creativity or efficiency is the highest priority.”51

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48 James, Geoffrey
49 Cain, New York Times article, *The Rise of the New Groupthink*
50 Bernstein and Turban
51 Furnham
The best innovation happens when people brainstorm on their own and then share ideas, a kind of “hybrid structure” combining open and closed offices. There is an exception, people perform better in groups when brainstorming happens online.

3.2 Perceived Cost Savings

Companies’ attempt to save money in real estate costs may be the biggest reason why the majority of offices use an open plan. An open plan allows greater density of employees with less square footage. The average space allotted to each employee has decreased from 225 square feet in 2010 down to 176 three years later and is projected to keep decreasing. In addition to trying to save costs by creating a denser office, there is a perceived cost savings in not having to build walls. There are also tax incentives for installing cubicles, considered office furniture, in 7 years versus 39.5 years for real walls, which are considered a permanent structure.

While office space is the largest cost for most businesses, human resources is second. In my thesis work, I argue that the harder-to-calculate value of talent, specifically employee productivity and attainment is higher than real estate costs. Open-plan offices will suffice for repetitive work, but for thinking work, workers need private personal space free from interruption. Research shows that workers in open offices lose 28% of their productive time to interruptions and distractions. When wanting to retain talent, it is wise to invest in individual workspaces as they are closely related to job satisfaction. An employee puts more emphasis on one’s individual workspace over the workplace overall.

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52 Girotra, et al.
53 Montgeau and Morr
54 Schwab
55 McCoy
56 Spira and Feintuch
57 Augustin, p.200
3.3 Corporate Image

Money is often spent on making a good impression on visitors. Many workplaces are image driven, where projecting a corporate image overshadows the need for workers’ ability to think. Businesses copy well known corporate offices, for example Google’s open-plan office as it is seen as the “face of innovation in Silicon Valley”. Calvin Newport, computer science professor at Georgetown University says, “Open offices have become a way to indicate a company’s value to venture capitalists and talent. The goal is not to improve productivity and collaboration, but to signal that the company is doing something interesting.” More attention is needed on the workspaces for everyday workers.

4 MY PREVIOUS PROJECT- HEADS UP/HEADS DOWN

This thesis is an expansion of my office design proposal for 229 Auburn Ave, where the building will be renovated to house a hypothetical software development company, Tech Company X. This office requires two types of work spaces that are separated onto two floors. About 2/3 of the staff are developers and need a quiet work environment for focused, heads-down work. My design houses them in a partitioned and carpeted, lower floor with limited public access. 1/3 of the staff have noisier tasks, such as sales, customer support, and business development. They are housed in the “social” third floor that has direct elevator access and a receptionist. There are individual workspaces as well as spaces for group work and socializing, such as conference rooms, lounge, and kitchenette.

58 Davis
59 Schwab
Heads Up/ Heads Down

Tech Company X is a small information technology company that will renovate and occupy the top two floors of a brick building, built in 1935, located in the Sweet Auburn Historic District of downtown Atlanta. The design calls for a separation of the employees, by floor, according to whether their work is “heads up” sales and business activities or “heads down” development work.

How does our built environment influence our ways of thinking?
Specifically, how can architecture foster deep, focused thought and also expansive, creative, cross-disciplinary thought?

How does the organization of space (in plan) foster vertical thinking vs. horizontal thinking in its occupants?

How do the spatial elements (in elevation) encourage these different types of thinking?

How can design address human factors, specifically the senses (psychological factors) to further influence thinking?

Figure 11 Jill Blass, “Concept”, Proposal for 229 Auburn Ave, 2019

Heads Up!

Visual “active zone” color and pattern is limited to areas 3’ to 6’ in height
Framed views (windows) are in this zone at 4’-6’

Focused on possibilities
Embracing new things
Welcoming outside influence
Curiosity and awareness
Questioning everything
The future
What could be
Imagination

Most of the furniture is in the visually muted zone (below the 3’ to 6’ high visual “active zone”) Simple, clean-lined furniture in muted colors and natural materials.

Figure 12 Jill Blass, “Heads Up Concept Drawing”, Proposal for 229 Auburn Ave, 2019
Third Floor

The third floor is the social “heads up” floor and houses the sales team (approximately one third of the staff), the business managers and offers social areas, such as the lounge and pantry area. Visitors arrive on this floor and are greeted in the reception area.

Program

<table>
<thead>
<tr>
<th>Room</th>
<th>Sq Ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reception</td>
<td>332</td>
</tr>
<tr>
<td>Conference Room</td>
<td>276</td>
</tr>
<tr>
<td>CEO's Office</td>
<td>180</td>
</tr>
<tr>
<td>Business Manager's Cubicle</td>
<td>80</td>
</tr>
<tr>
<td>Human Resource Mgr's Office</td>
<td>143</td>
</tr>
<tr>
<td>Sales Desks (v8)</td>
<td>512</td>
</tr>
<tr>
<td>Huddle Room</td>
<td>100</td>
</tr>
<tr>
<td>Pantry</td>
<td>120</td>
</tr>
<tr>
<td>Lounge</td>
<td>225</td>
</tr>
<tr>
<td>Cost Closet</td>
<td>15</td>
</tr>
</tbody>
</table>

Figure 13 Jill Blass, “Heads Up Floorplan”, Proposal for 229 Auburn Ave, 2019

Heads Down!

Visual “active zone” color and pattern is limited to areas 0-30” in height

Muted color and pattern on desktop area and above.

Focused on delivery
Tuning out distractions
Avoiding influence from your surroundings
Execution
Getting things done
Right now
What is
Deadlines

Figure 14 Jill Blass, “Heads Down Concept Drawing”, Proposal for 229 Auburn Ave, 2019
5 GOAL OF THESIS

There is a great need for better designed workplaces. Frequently the layout and furnishing of an office is designed by an office manager or other non-design professional due to budgetary constraints. Even when the workplace is professionally designed and has an abundant budget, for example the $5 billion dollar Apple Park, the architect may prioritize visual appeal over user performance and result in an office that while stunning to look at, fails to serve the human needs of its users.\(^{60}\)\(^{61}\) The irony is that by employing jazzy architectural innovation, the space actually diminishes the user’s ability to be innovative.

The aim of this thesis is to promote design strategies for fostering thinking in the workplace in an accessible format. There is a trove of evidence-based research on how people respond to and interact with their work environment. This information, typically in the form of

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\(^{60}\) Headquarters for Apple, Inc., designed by Foster and Partners,

\(^{61}\) Aouf, Rima Sabina
research papers, is not being accessed by the people it is intended to serve. Dr. Sally Augustin in her book *Place Advantage: Applied Psychology for Interior Architecture* has compiled credible research and synthesized this information to provide guidance for interior designers. 62 I rely heavily from her book and further distill her language and put it into the Alexandrian format of a Pattern Language. My goal is to transform her findings into simple, concrete recommendations that are quickly and easily understood by non-professional designers. By presenting this information as a pattern language, I hope to add upon Alexander’s important work.

5.1 Definitions

**Heads up**- thinking that is expansive, creative, cross-disciplinary, and collaborative. *Fast Company* Magazine describes being “heads up” at work as scanning possibilities, embracing new things, welcoming outside influence, curiosity and awareness, questioning everything, the future, what could be, and imagination.

**Heads down**- thinking that is internal, concentrating, and focused on the task at hand. The same *Fast Company* article describes being “heads down” as focused on delivery, tuning out distractions, avoiding influence from your surroundings, execution, getting things done, right now, what is, and deadlines.63

**Patterns**- the repeatable ways people interact with their physical environment. Patterns are observed and documented by researchers.

A **pattern language**- theory coined by architectural theorist Christopher Alexander, where patterns describe good design practices, originally in the field of architecture, that have been proven by research and observation. The patterns are predictable human responses and

62 Augustin, p xi
63 Linkner, Josh
interactions with the built environment. They are recurring and aim to help non-professionals make design decisions. The patterns form a language in how they are networked together and build upon each other.\textsuperscript{64}

**Physical environment**- the part of the human environment that includes purely physical factors (as soil, climate, water supply) and the built environment.\textsuperscript{65}

**Built environment**- defined as part of the physical environment that is constructed or modified by humans for human activity.\textsuperscript{66} This includes workplaces.

**Traditional office space**- an enclosed office space with 1-2 people

**Open-plan office**- has a lack of interior walls and is usually a larger space that contains many more employees with individual workstations arranged in groups.

**Psychological privacy**- the degree that individuals feel visually and/or acoustically exposed\textsuperscript{67} and the amount of control one has in limiting their social contact with others.

**Displayed thinking (graph visualization)**- originally a business management term coined by Mike Vance, the former managing director of Walt Disney, where ideas that come up while creating a strategy plan are documented and displayed in a graphical form.\textsuperscript{68} The term has expanded to include any brainstorming or creative process that is openly shared by being visible in a pin-up board. It allows for others’ input to be added. It is a physical visualization of ideas and how they are interconnected.

\textsuperscript{64} Alexander
\textsuperscript{65} www.merriam-webster.com/
\textsuperscript{66} Saelens and Handy
\textsuperscript{67} Sundstrom, Burt, and Kamp
\textsuperscript{68} Karlof, & Lovingsson
Heads Up/Heads Down: A Pattern Language for Fostering Thinking in the Workplace

By Jill Blass, candidate MFA in Interior Design at Georgia State University

This handbook is a proposed addendum to Christopher Alexander’s *A Pattern Language: Towns, Buildings, Construction*. My proposed entries follow Alexander’s format, where first a problem is posed and then its solution is offered. His original patterns are numbered 1–253. My patterns are numbered 254–260. The typography and layout I use is a close approximation to the original book.

**BACKGROUND**

In 1977, Christopher Alexander, Sarah Ishikawa, and Murray Silverstein published their ambitious catalog of the entire built environment, *A Pattern Language*, with its corresponding text *The Timeless Way of Building*. Both sought to describe universal and timeless building practices. There are a few entries describing office design such as SELF-GOVERNING WORKSHOPS AND OFFICES (pattern number 80), OFFICE CONNECTIONS (82), and FLEXIBLE OFFICE SPACE (146).

These patterns are still relevant today, but in terms of the nature of work, a lot has changed since the 1970s. Today’s workplace has a greater demand for knowledge work where one must “think for a living”. In addition to “heads down”, linear, convergent thinking, employees must be able to think creatively and expansively in a “heads up” manner to effectively solve problems. This handbook aims to address the modern workplace with its emphasis on thinking.

*Figure 16 Heads Up/Heads Down Handbook page 1*
SUMMARY OF THE LANGUAGE

Heads Up/Heads Down: A Pattern Language for Fostering Thinking in the Workplace consists of 7 entries (or entities) that describe built conditions that will facilitate thinking. While Alexander’s patterns are based from his and his team’s vast experience in building and planning, these new entries are based on social science research that can be interconnected. They are also meant to be networked with Alexander’s language.

Alexander best explains how these entries synthesize into a language. He writes, “The elements of this language are entities called patterns. Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice.”

254. LAYOUT FOR INNOVATIVE THINKING

255. PARTITION WALLS FOR FOCUSED THINKING

256. DISPLAYED THINKING

257. RESTORATIVE VIEWS OF NATURE

258. WALKING FOR CREATIVE THINKING

259. OPERABLE WINDOWS IN THE OFFICE

260. REDUCE NOISE FOR CONCENTRATION

Figure 17 Heads Up/Heads Down Handbook page 2
LAYOUT FOR INNOVATIVE THINKING

Steelcase’s Quite Space Office with view of informal group space

Figure 18 Heads Up/Heads Down Handbook page 3
spaces should be different to suit the required task. Open-plan offices are suitable for conversing with others and for repetitive tasks, but innovative thinking requires a combination of individual work areas for focus and a group area for the exchange of ideas. (Davis, et al).

There is a myth that innovative thinking occurs best in group settings.

Studies show that the best innovation happens when people first brainstorm on their own and then share ideas (Girotra, et al). An office layout that combines both closed work spaces for individual thinking and open areas for group brainstorming will best foster innovation.

Therefore:

When innovative thinking is needed, provide closed offices for individual, focused thinking and an open area for the group to gather and share ideas. Locate the group area near the individual workspaces. Give these workspaces a view of the group area, so that the employee can see if others are gathering. Locate the group area midway along a circulation path. If it is located at the end, it will instead be used for individual work (Augustin).

Figure 19 Heads Up/Heads Down Handbook page 4
Include a pin-up board in the group area to facilitate the sharing of ideas—DISPLAYED THINKING (245). The individual work areas should be free from visual and auditory distractions—PARTITION WALLS FOR FOCUSED THINKING (246).

Alexander's *A Pattern Language* discusses three patterns related to the layout of office space; FLEXIBLE OFFICE SPACE (146), COMMON AREAS AT THE HEART (129), and INTIMACY GRADIENT (127) and two patterns about working in groups, SMALL WORK GROUPS (148) and SMALL MEETING AREA (151). . . .
PARTITION WALLS FOR FOCUSED THINKING

Steelcase’s modular Privacy Walls

Figure 21 Heads Up/Heads Down Handbook page 6
The open-plan office is the most common office design, but unfortunately, it is also the most hated type of workspace (Schwab, 2019). It is correlated with higher job dissatisfaction, loss of productivity, and low performance (Augustin). In terms of thinking, open plan workspaces hinder one’s ability to focus and concentrate. Noise, interruptions and seeing people moving around result in decreased ability to concentrate (Berti and Schöger, 2006).

+++

Individuals perform better on straightforward and complex tasks when working in an enclosed room. Unfortunately, most offices have an existing open plan and don’t have walls to block visual and auditory distractions. This results in hindered thinking and low performance.

Focused work areas should have high percentage of enclosed walls (ideally a private office), low density with sufficient distance from noisy areas, high circulation area, high level of acoustical treatments (Heerwayen, 2004).

Therefore:

If building walls is not an option. Install partitions. Modular kits are available or use stick-built construction. Partitions between workspaces need to be at least 60” tall on three sides to provide visual screening and 64-66” tall for acoustical shielding (Charles, K.E. et al.).
In addition to installing partitions for individual work areas, consider the layout of these areas in relation to a group area for collaborative work — LAYOUT FOR INNOVATIVE THINKING (254). RESTORATIVE VIEWS OF NATURE (257) can help replenish energy after intense focus and WALKING FOR CREATIVE THINKING (258) can help one solve a problem.

Alexander’s A Pattern Language discusses workplace enclosures in HALF PRIVATE OFFICE (152) and WORKPLACE ENCLOSURE (183). . . .
DISPLAYED THINKING

Jonathan Adler's workspace and pin-up board
Photo from Lommy magazine

Figure 24 Heads Up/Heads Down Handbook page 9
When thinking creatively and strategically, there are many ideas and lines of thought that need to be pursued and developed.

It can be difficult to remember, organize, and track the numerous ideas in our head. It is also difficult to explain and share ideas that are not represented in physical form.

During the brainstorming and creative process many ideas are flying around. It is helpful to “pin down” these ideas by documenting them in graphical form. This documentation allows the ideas to be visible and shared with others. Designer Jonathan Adler uses corkboards to visualize workflow and project deadlines, ideas for patterns, and inspirational sculptural forms (Santiago).

Therefore:

Use a pin-up board as a dedicated space for ideas, inspiring imagery, notes from work, etc. This can help you follow your own ideas and enhance collaboration with others as a shared visual of what you and others are working on. Pinning ideas on a pin-up board is a way to share work physically in real time versus on a screen with a delayed response.

Use cork or other sound absorptive material. This will help you focus by lessening auditory distractions — REDUCE NOISE FOR CONCENTRATION (259).

Alexander writes about what kinds of things to pin up on one’s walls in THINGS FROM YOUR LIFE (253). . . .
257  RESTORATIVE VIEWS OF NATURE

Etsy’s living, green wall
Photo by Garrett Rowland, courtesy of Gensler

Figure 26 Heads Up/Heads Down Handbook page 11
When working in an indoor office, we are obviously not outdoors. We typically are not relaxing with our feet on the grass, while smelling flowers and basking in the sunlight. We are plugging away, working at our desk and becoming cognitively exhausted.

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When thinking at work all day, we become cognitively depleted and need to recharge our mental energy.

Dr. Sally Augustin writes, “People who spend hours every day solving mental problems, as most knowledge workers do, become cognitively exhausted; they deplete their mental stocks of energy. Cognitive exhaustion spreads insidiously from its root cause and degrades performance on all mental tasks, whether they involve processing information, solving a problem, or determining appropriate behavior in a particular circumstance. We become distracted, irritable, and impulsive when mentally exhausted.” (Augustin, p.31)

Rachel Kaplan’s research on workplace design and restorative places has found that views of nature can replenish mental energy. Views of nature (or other natural things) from a window result in one feeling better, being more satisfied with one’s job, and performing better. In addition to improving job performance, seeing plants promotes creativity and makes knowledge workers better at doing their jobs (Augustin, p.187).

Figure 27 Heads Up/Heads Down Handbook page 12
Therefore:

**Provide views of nature through a window and also bring natural elements into the workplace to help employees relax and recharge.**

Ensure that the view out the window is of trees or grass. In Kaplan’s research, views of just sky or buildings were not as effective as nature views.

Inside the workplace, incorporate large potted plants into the floor plan, smaller potted plants on furniture and hang plants from the ceiling. Emulate outdoor environments with large installations of plants, such as living green walls.

+ + +

Plants can improve air quality and thus improve cognitive function. This can also be achieved by opening windows — OPERABLE WINDOWS IN THE OFFICE (259). Plant installations also help with noise reduction — REDUCE NOISE (260), an important goal when designing spaces for thinking.

Alexander’s *A Pattern Language* talks about tree plantings outside a building — FRUIT TREES (170) AND TREE PLACES (171). There are two entries about interior views looking out into the landscape — ZEN VIEW (134) and A WINDOW PLACE (180). There’s an entry that describes climbing plants that can be grown inside the office or outdoors — CLIMBING PLANTS (246). . . .

*Figure 28 Heads Up/Heads Down Handbook page 13*
258  WALKING FOR CREATIVE THINKING

Photo from Medium.com article Why Walking Helps Us Think: Stanford Study Finds that Walking Improves Creativity

Figure 29 Heads Up/Heads Down Handbook page 14
Many people seem to do their best thinking while walking. In the Netflix docuseries *Inside Bill’s Brain: Decoding Bill Gates*, Melinda Gates describes how Bill typically paces around while working. Other thinkers such as Joyce Carol Oates, Wordsworth, Thoreau, and Dickens have reported walks are integral to the creative process (Augustin, p.194).

+++ Workplaces typically encourage one to be sedentary, to sit at a desk and work. Sitting versus walking limits one’s creative thinking and ability to problem solve.

People are active beings and need to sit, stand, and move. Movement, specifically walking, has been shown to benefit creative thinking. Researchers at Stanford University found that a person’s creative thinking increased by 60% when walking compared to sitting (Oppezzo and Schwartz). Walking around helps one be creative and solve problems.

Therefore:

Add walking paths inside and outside the office to aid in creative thinking. Design the paths to be safe from external factors; free from obstructions, tripping hazards, speeding cars, etc. Locate paths away from employees that are performing focused work.
While walking benefits creative brainstorming, the Stanford study showed no positive effect on focused thinking (required for single, correct answers). Focused thinking, or “heads down” thinking, benefits from hunkering down in place — PARTITION WALLS FOR FOCUSED THINKING (255).

The Stanford study found that the movement of walking itself, not the indoor or outdoor environment, spurs creative thought, although including views of nature can help recharge one’s focus— RESTORATIVE VIEWS OF NATURE (257).

For more ideas about designing walking paths, read Alexander’s A Pattern Language entries; PROMENADE (31), THE NETWORK OF PATHS AND CARS (52), RAISED WALKS (55), PEDESTRIAN STREET (100), PEDESTRIAN DENSITY (123), PATHS AND GOALS (120), PATH SHAPE (121), and TRELLISED WALK (174). . . .
259  OPERABLE WINDOWS
IN THE OFFICE


Figure 32 Heads Up/Heads Down Handbook page 17
Human beings need daylight to regulate our circadian rhythms, it’s vital to our well being. Unfortunately many offices lack access to natural light. This negatively affects our ability to work. In addition, poor indoor air quality further causes our mental cognition to decline (Allen, MacNaughton, et al.).

Access to natural light is important for well-being in the workplace. Humans also need fresh air. Many workplaces aren’t designed to provide these basic human needs.

Daylight can improve one’s ability to think and areas that have natural light at linked to higher worker satisfaction (Augustin, p.186).

A Harvard study showed that cognitive scores were 101% higher when tasks were done in an environment with air similar to a high outdoor ventilation rate versus air typically found in office environments, where there are high levels of VOCs and CO2 (Allen, MacNaughton, et al.)

Therefore:

**Plan the workspace, so that it has access to natural light and operable windows. Use windows, skylight, transom windows, glass partition, etc.**

Prioritize windows with a view. Minimize windows on east and west sides due to glare from direct rays. Glare from southern exposures can be controlled with overhangs.
and awnings (Karlen, Benya, Spangler, p.24). Provide light control with roller shades, blinds, curtains, etc.

Daylight, light from the sky is preferable over sunlight because direct sunlight creates shadows and glare (Karlen, et al, p.20).

Penetration of daylight is generally twice the width of the window and 2-2.5 times the window’s height (Karlen, et al. p.24).

Place workstations near windows. The larger the window and the closer the proximity will increase one’s sense of wellbeing, happiness and alertness. People that sit closer to a window are more on task and are more productive than employees sitting farther away (Augustin, p.188).

Windows may also provide a view of nature, which can replenish mental energy — RESTORATIVE VIEWS (257) .. This is especially important when doing “heads down” thinking where one may become cognitively exhausted — PARTITION WALLS FOR FOCUSED THINKING (255).

A Pattern Language, published in 1977, has four entries about windows that are not specific to the workplace; WINDOWS WHICH OPEN WIDE (236), WINDOW PLACE (180), WINDOWS OVERLOOKING LIFE (192), and NATURAL DOORS AND WINDOWS (221) and INTERIOR WINDOW (194) ..
260 REDUCE NOISE FOR CONCENTRATION

Photo from www.commercial-acoustics.com

Figure 35 Heads Up/Heads Down Handbook page 20
Noise is the biggest issue that employees would most like to be able to control. Studies have shown that background noise is related to task performance (Leaman and Bordass). Noise has been shown to increase stress level, distract, and make workers less satisfied with their physical environment. Sometimes people don’t realize that noise is making them physically tense. In one study, the body’s stress levels were tested in noisy and quiet environments. Workers perceived experiencing the same level of stress in both environments, but their measured physiological stress levels were higher in the noisy environment (Augustin, p. 192).

 Offices are noisy. Exposure to noise creates stress in employees and diverts brainpower, thus taking away focus. This hinders thinking.

Workers need to be calm to do their best thinking. Noise makes one stressed and distracts from the task at hand. Instead of doing one’s job, one instead thinks about understanding the stressful situation and how to fix it (Evans and Cohen).

Therefore:

Reduce noise with proper space planning, use of sound absorptive materials and sound rated wall, floor, and ceiling assemblies.
Proper space planning includes locating noisy office activities, such as the lounge or printer area, away from work areas. Separate loud and quiet rooms. Ensure that partition dividers are at least 64-66" tall to act as a sound screen—PARTITION WALLS FOR FOCUSED THINKING (255). Use sound absorptive materials like cork or felt on the walls and partitions.

Cork covered pin-up boards can help absorb noise—DISPLAYED THINKING (256). Dense areas of plants can also absorb unwanted sound—RESTORATIVE VIEWS OF NATURE (257).

Alexander writes about the conditions needed for a good workplace in WORKPLACE ENCLOSURE (183). He talks about needing at least 8' of distance between employees to reduce overhearing conversations...
REFERENCES


https://www.lonny.com/Jonathan+Adler+At+Work
7 CONCLUSION

In today’s workplace, employees’ ability to think is the most valuable “input” or resource in a company. The World Economic Forum’s *Future of Jobs Report* lists complex problem solving, critical thinking, and creativity as the top three skills needed in the 2020 workplace. I want to help employees access their full thinking potential. My *Heads Up/Heads Down Handbook* has strategies for how to design offices to optimize this important resource.

There is an abundance of evidence-based research showing what spatial conditions will enhance thinking, but there seems to be a problem in accessing this information and getting it into the hands of people charged with setting up offices. Dr. Sally Augustin, in her book *Place Advantage: Applied Psychology for Interior Architecture*, does a good job in compiling some of this research and presenting it in terms of how interior designers can improve the workplace. In an effort to further increase accessibility, I have transformed her findings into simple, concrete recommendations that are quickly and easily understood by non-professional designers.

My handbook is easy-to-follow with ideas to consider when designing spaces for thinking. I was inspired by the concept and the simple, straight-forward format of Christopher Alexander’s *A Pattern Language*, where he catalogs the entire built environment, poses problems, offers solutions, and networks this information so it may build upon itself. My handbook’s “links” network my new proposed patterns as well as integrate with his historic ones. His patterns really are timeless and still relevant today. I hope that people read my handbook, build better offices, and go on to read his book to build a better world.
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