

Chapter 11: Ergonomics

Overview

Ergonomics is the scientific study of the relationship of employees to their physical environment, including the workspace and related tools. This has become an active area in the research fields to increase the comfort (and productivity) of employees. Some students may be surprised at the amount of thought and research that goes into these plans, but this chapter should assure them.

Lecture Notes

A. Rationale for Ergonomic Environments

Productivity and morale are very important to job performance, and so is the worker-technology interface. *Emphasize that this has become important so that workers and working conditions are comfortable.*

1. The **Psychological Basis for Ergonomics** is the effect that such factors have on employee attitudes and behaviors.
 - a. Rationale for technology is based on making sure employees understand the reason that tasks are automated; the communication lines should be open.
 - b. Functionality for users includes the perception of the administrative professionals' work area and workspace design.
 - c. Personnel development is increasing with the training associated with information systems; be sure employees are aware of the opportunities that are available.
 - d. Challenges arise as administrative professionals adapt technology to the tasks they completed in other ways before.
 - e. Morale boosters occur when administrative professionals have a voice in the way changes are made.
 - f. Employee attitudes toward environment may be a reflection of individual beliefs or the ability to handle change; these attitudes are often shared.
 - g. Employee reaction to change at different paces – early adapters, late adapters, and nonadapters are going to be part of the work force.
 - h. Motivation comes from a positive environment; administrators should create such an environment with good communication.
2. **Physiological Basis for Ergonomics** implies that physical structures in the office should be geared to the physical needs of the workers.
 - a. Environmental factors include furniture, lighting, atmospheric conditions, sound/office noise, and work area design/workspace preferences.
 - b. Physiology of workers includes their body structure and physical movement demanded of them as they do their job. *Define biomechanics – study of musculoskeletal effort of human beings.)*

3. **Sociological Basis for Ergonomics** is related to sociology and the increased reliance on teams in the workplace.
 - a. The establishment of workplace clusters allows office systems to function cooperatively and effectively.
 - b. An emphasis on teamwork and team effort plays a large role in the success of group activities; groupware is a helpful tool.
 - c. Worker specialization requires some personnel to become specialized in an area while others function in a general capacity.
 - d. Individual needs for territoriality and “ownership” of workspace is necessary for effective job performance.
 - e. Seeking qualified applicants for entry-level positions is important for them to function effectively.
 - f. Career development opportunities are available to work toward advancements or promotion.
4. **Communication Theory as a Basis for Ergonomics** refers to the importance of effective communication in an office environment. It must be conducive to different means of communication in order for employees to be effective in their jobs. The physical structure of the office will either facilitate or hinder communication.
 - a. The types of communication to consider include written, oral, non-verbal, face-to-face, and electronic; availability of technology and the value placed on the information may impact the decision.
 - b. Use of computer-based information systems is essential in today’s workplace with the use of networks.
5. **Other Ergonomic Concerns** relate to work functions and workflow processes.
 - a. Work functions are determined through analysis of the tasks and clusters to determine the people-technology interface.
 - Analyze office tasks to find ways to relate the task to the technology so the worker is comfortable.
 - Analyze clusters of related tasks to determine the best layout of space.
 - Use work logs to see actual time spent on tasks.
 - b. Analyzing the workflow or the path a document takes through the office is helpful to ensure that there are no delays in the process.

B. Understanding Health Hazards

There is considerable concern about the health issues related to employees’ extended interface with computer components.

1. **Employee Health Concerns and Complaints** focuses on specific areas prompting research in those subjects.
 - a. Repetitive-strain injury results from tasks that require continuous repetitive motion. *Alert administrative professionals about the symptoms for their own safety.*

- b. Visual dysfunction may be caused from time at display monitors or due to a design issue related to the monitor or office. There are questions related to the use of monitors as a cause.
 - c. Musculoskeletal problems like carpal tunnel syndrome or tendinitis can be relieved with ergonomically designed equipment that encourages appropriate posture when using it.
 - d. Emotional disturbance may affect performance; both mood disturbances and psychosomatic disorders afflict employees.
 - e. Psychosocial disturbances can be minimized through training prior to making changes in the office, thus reducing the stress associated with the change.
2. **Environmental and Workspace Design** research is influencing ergonomic systems. *Review figure 11-1 and explain the importance of such a layout/position when working at the computer.*
- a. Environmental design considerations include screen glare, possible radiation emissions from the monitor, temperature, and humidity.
 - b. Workspace design issues include the “three measurements” (knee, elbow, and eye) and the adjustments set on equipment (chair, keyboard, and monitor).
3. **Business Research into Productivity** continues to show that comfort and training lead to productivity.

C. Environmental Factors

1. **Lighting** considerations include the quantity of light, brightness, contrast light reflectance, absence of glare, and uniformity.
- a. Task lighting is direct light that illuminates the work surface.
 - b. Ambient lighting is the indirect light in an area.
 - c. Natural daylight is efficient, but it must have alternatives available.
 - d. Fluorescent lighting is the most common source in offices; it resembles natural light.
 - e. Incandescent lighting produces more glare and shadowing on work surfaces, but it is less expensive.
2. **Color Conditioning** says that the effect of color on performance has been studied; people react to different colors. Employees are more relaxed in rooms with variation in color and light.
3. **Sound** is controlled with absorption, reflection, and isolation.
- a. Absorption refers to the engulfing of sound waves by environmental materials.
 - b. Reflection is the bouncing of sound waves off a material and back into space.
 - c. Isolation is the prevention of sound waves from passing through environmental materials.
4. The **Condition of the Air** in the office (temperature, pollution, humidity) affects productivity.

- a. Sick buildings are infected with microorganisms at levels that make people sick; this can be caused by poor ventilation or an airtight building.
 - b. Symptoms of a sick building must be acknowledged. *Review the list on p. 276.*
 - c. Corrective actions should be taken to eliminate the problems related to a sick building. *Review the list on p. 277.*
5. Versatility of office space (**Surface Textures, Shapes, and Arrangements**) enables comfort.
- a. Movable partitions can be matched to many needs in the office with minimal cost and effort.
 - b. Work surfaces affect the ability to produce high-quality work; the height of the surface, amount of surface space, and accessories are important.
 - c. Seating that allows for comfort and personal adjustments should be used.
6. **Control of Static Electricity** is a safety issue.
- a. Static on a person's body can be dispelled by touching a static dissipative table mat or printer cushion before touching equipment.
 - b. Static created from walking across a floor can be avoided with floor coverings or mats.
7. **Adequate Power** should be available (backup systems) and safe. Employees should be trained on what is available and encouraged to SAVE OFTEN.
8. **Security** technologies are available; passwords are still the most common.
9. **Energy conservation** programs are in place in many offices with facilities managed using a computer system.
10. **Employee Response to the Environment** affects comfort and productivity.
- a. Daily time limits for display monitor operation should be set at 5 hours/day; be sure to look away from the screen every 15 minutes to give your eyes a break.
 - b. Rest periods should be taken every hour to get out of the desk and move around.
 - c. Reassignment to another position should be available for pregnant women because of the potential radiation exposure.
- D. Ergonomic Standards and the Office Environment
1. **Ergonomic Standards** have been set based on research.
 - a. German Institute for Standardization and the Trade Cooperative Association have developed 30 standards. *Review the partial list on p. 280.*
 - b. Occupational Safety & Health Administration (OSHA) covers many industries to ensure the safety of employees.
 - c. International Standards specify that well-designed tasks should safeguard the worker's health and safety, promote well-being, and facilitate performance. *(Review figure 11-2: IOA Ergonomic Standards.)*

2. **Ergonomic Workspaces** provide a well-designed workspace for productive and efficient employees.
 - a. Private work tasks require one to think, read, analyze, or evaluate in a quiet atmosphere.
 - b. Public work tasks necessitate a social setting and face-to-face interaction.
 - c. Electronic work tasks use electronic office systems like computers, telephones, and/or fax machines.
3. **Select User-Friendly Hardware and Software** and an ergonomic arrangement to keep employees comfortable and safe.
4. **Human Physiology** – The most important factor is the human element—the worker, physical anatomy of the worker, and how the individual adapts to the office space.

Additional Resources for Students

Recommended readings (no texts should be more than two years old):

- Calkins-Fulton, Patsy J. and Joanna D. Hanks. *Office Technology and Procedures*. South-Western Publishing Co.
- Champoux, Joseph E. *Organizational Behavior: Integrating Individuals, Groups, and Processes*.
- Davis, Fruehling, and Oldham. *Psychology: Human Relations and Work Adjustment*. McGraw-Hill Book Co.
- Keeling, B. Lewis and Norman F. Kallaus. *Administrative Office Management*. South-Western Publishing Co.
- Northcraft, Gregory B. and Margaret A. Neale. *Organizational Behavior*. The Dryden Press.
- Oliverio and Pasewark. *The Office: Procedures and Technology*. South-Western Publishing Co.
- Quible, Zane K. *Administrative Office Management – An Introduction*. Prentice-Hall, Inc.
- Ray, C., J. Palmer, and A. Wohl. *Office Automation: A Systems Approach*. South-Western Publishing Co.
- Robbins, Stephen P. *Organizational Behavior*. Prentice-Hall, Inc.
- Scriven, Kozell, Myers, and Hapke. *Professional Office Procedures*. Glencoe/McGraw-Hill.
- Steers, Richard M. *Introduction to Organizational Behavior*. Harper Collins Publishers, Inc.
- Tilton, R., J. Jackson, and S. Rigby. *The Electronic Office: Procedures and Administration*. South-Western Publishing Co.
- Wagner, J. A. and J. R. Hollenbeck. *Organizational Behavior*.

Current issues of periodicals or business publications are also an excellent resource. Some of the following periodicals have an accompanying Web site.

<i>Current Periodical</i>	<i>Web Address</i>
<i>Business Week</i>	http://www.businessweek.com
<i>Fortune</i>	http://fortune.com
<i>IAAP Complete Office Handbook</i>	http://www.iaap-hq.org/products/handbook.htm
<i>Modern Office Technology</i>	
<i>OfficePro</i>	http://www.iaap-hq.org/officepro/toc.htm
<i>The Office</i>	
<i>Wall Street Journal</i>	http://online.wsj.com/public/us