

Learning Environments

For the Information Age



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It begins at birth... with the first blink, the first kiss, the first voice.

The human infant awakens with learning at the most fundamental level...

discovering light and sound, smell and taste, motion and touch.

That learning continues throughout one's life...

by attempting, experiencing, and observing actions every day.



The Importance of Knowledge and Learning

In business, learning has always played an essential role. But as the information age has emerged and evolved, learning has taken on new importance... a critical role.

Knowledge is power

Contemporary authors have explored the shifting landscape of power and thought through three contemporary eras: the agricultural, industrial, and information ages. In *Power Shift*, Alvin Toffler explores how power bases shift as eras change and evolve. In the agricultural era, those who owned the land owned the power. In the industrial era, it was the holders of might and wealth who were powerful.

In the information age, knowledge has become the new base of power. This, combined with an unprecedented rate of change, makes continuous learning a fundamental skill for survival.

No longer can workers learn to operate one piece of equipment in their youth and continue to use that same skill for 40 years. Today, workers may need to learn to operate a new machine, or a new software program, or a new hardware configuration every 18 months or less. And when technology makes those old skills obsolete, workers may need to embark on a new career.

The Importance of Knowledge and Learning

(continued)

This environment of change accelerates the need to learn. For workers in virtually any occupation, in any part of the world, learning is part of the job. And, while learning basic tasks is still a requirement for many situations, today's workers are also expected to master a higher order of learning... one that depends on interaction and collaboration with other workers.

In self-directed teams, they are expected to diagnose and solve problems. In collaborative work groups, workers are expected to leverage each other's knowledge to gain a competitive advantage. In research laboratories, they are expected to build on the work of others to seek new solutions.

For today's knowledge workers, struggling to keep up with this world of change and the demands of collaborative work, the workplace must transcend its traditional role. It must be designed to provide more than just shelter and a place to listen to a teacher. It must function at a higher level, actively supporting the kind of work and learning that takes place there.

With intelligent and thoughtful design, organizations can leverage the role of the workplace as a dynamic learning environment, encouraging and facilitating more effective learning.

Learning as a Process

Many in our society still think about knowledge as a product or substance that must be acquired, rather than as a lifetime evolutionary process.

Fostering learning

Learning should be viewed as a systematic process. It must be fostered in each facet of a business or organization: in people and structures, in business or operational processes, in technological support, and in the physical space. Impediments to learning in any one of these areas can prevent individual and organizational learning. A story helps illustrate the point.

An electronics company seeks to train its sales force in a new selling methodology. The sales organization includes talented people capable of learning the new approach. The organization clearly defines the training process, including key prerequisites and milestones. The organization provides state-of-the-art training technology, on-line in every workspace. But after six months, progress is negligible. Only a tiny fraction of the sales force has even logged onto the training network. No one has completed the training.

To boost results, a savvy manager suggests providing a dedicated training room available by half-day reservations only. No phones, no guest chairs, no distractions. Entering the training room means donning headphones and getting into the learning mode.

After another six months, results are dramatic. With the provision of dedicated space, coupled with a process enhancement that encouraged reserving time for training, participation skyrocketed. Workers learned, results improved.

The learning environment is not a passive backdrop. It can distract or focus attention, impede or inspire learning, prevent or promote progress. It can transform a static, passive state into a dynamic, active mental pursuit for knowledge. It can be the key to establishing a competitive advantage in the Information Age.

Learning Trend

In 1997, U.S. organizations budgeted \$58.6 billion for formal training.

Source: Industry report 1997, Training Magazine.

From Individual to Collaborative Learning

From the most solitary endeavor, such as learning to tie one's shoes, to the most interactive effort, such as becoming a team, learning occurs on a continuum of collaboration.

Individual learning

Traditionally, we have thought of learning as a solitary endeavor — something we did on our own. In a typing class, for example, the instructor may direct a large group of students to repeat the same drill. A motivated student may repeat the drill 12 times, training the hands and the mind to execute those keystrokes. A less motivated student may repeat the drill only four times, achieving a lower level of learning. Although they are being taught in a group, each student is learning individually; the level of learning is not dependent upon interactions between the students.

Individual learning takes many forms... from developing basic computer skills to memorizing advanced product information to acquiring the thinking skills required to solve complex problems.

At the individual level, learning must be accomplished to meet a range of needs: from the most basic operating requirements to the most sophisticated demands for concept exploration and development. To meet basic requirements, workers must learn the rules of the workplace, the processes and procedures of the job, and the standards of safety and quality. Students must lay the groundwork for more advanced learning: memorizing multiplication tables, rules of grammar, parts of speech.

At a more sophisticated level, the worker and the student must learn to integrate the knowledge found in primary and secondary sources with their own thinking, analysis, and insights.

For both kinds of individual learning, the environment can have a profound effect on the learning process.

Learning Trend

35% of U.S. organizations use teleconferencing — in audio, video, data, or multimedia form — for distance learning and education. Nine percent of organizational training is conducted with teleconferencing.

Source: *Industry report 1997*, Training Magazine.

From Individual to Collaborative Learning

(continued)

Collaborative learning

Time was, if we “collaborated” while learning, it was called cheating. Now, we realize the value of, in fact the need for, collaboration among learners of all ages.

Collaboration is important for all ages and stages of learning. In a science class, for example, students may form teams to develop and test a hypothesis. From discussion and sharing of ideas, each member of the group acquires a broad collection of perspectives and ideas, achieving higher understanding of alternatives and possibilities. The learning is dependent upon interaction; no member of the group could achieve the same level of learning by reading reference material or doing independent research.

Some experts define learning as an inherently social process. In their book, *The Knowledge-Creating Company*, Ikujiro Nonaka and Hirotaka Takeuchi assert that, in business, the ability to convert individual experience and wisdom (tacit knowledge) to group understanding and action (explicit knowledge) is the key to many Japanese companies’ competitive advantage. This ability enables businesses to leverage the guiding wisdom of senior managers with the innovative creativity of junior engineers to create unprecedented solutions that respond to and redefine their markets.

In schools and educational institutions, collaborative learning can occur in virtually any environment, but some spaces are uniquely suited to fostering the interaction required for this kind of group learning. Media centers, labs, libraries, lounges... spaces that allow students to gather in small groups support collaborative learning to varying degrees.

In many business environments, with offices and workspaces geared to individual work, spaces that support collaborative learning are more rare. Traditional conference rooms and meeting rooms meet basic requirements, but often do not provide the flexibility to foster true “knowledge conversion.”



Huddleboard™ helps people share ideas.

Learning Trend

81% of all formal training courses take place in classrooms with live instructors; of all IT training, 76% are taught by live instructors.

Source: Industry report 1997, Training Magazine.

Self-directed Learning

From tightly defined curricula that form the basis for highly directed lecture classes... to loosely defined learning objectives that set a general direction for student-directed studies... learning occurs across a broad spectrum of approaches.

Self-direction varies

People learn differently and have different strengths and weaknesses. Harvard's Howard Gardner has identified eight distinct human intelligences, which everyone possesses to a certain degree. An intelligence, according to Gardner, is an ability to solve problems or create products valued in one or more cultures.

Self-direction is the degree to which students determine when, where, and how they learn. This adds another dimension to the individual versus group learning dynamic. When you learn alone, you may be guided by a mentor, or you may be directing your own exploration and research. When you learn with others, you may be listening to a lecture, or you may be conducting a group study.

Low self-direction

At one end of the range, an instructor directs the student or students, defining the content to study, the process to follow, the exercises to complete. Many traditional educational models are based upon instructor direction.

High self-direction

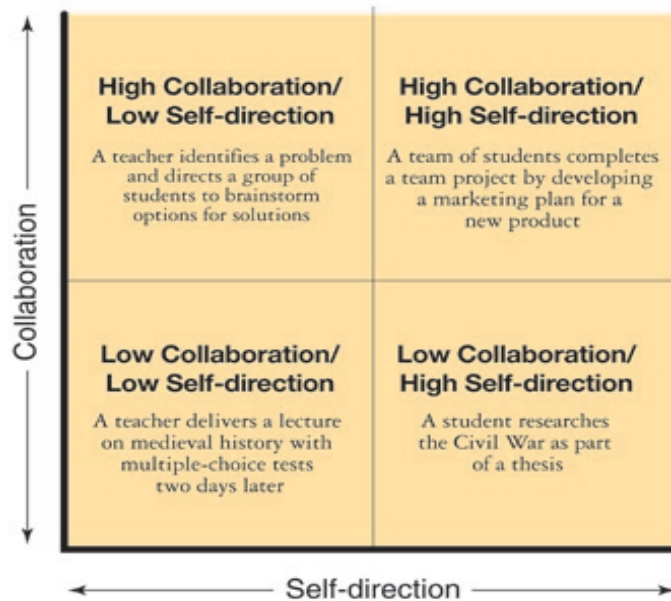
At the other end of the range, pure self-directed learning involves little instructor direction. The learner has more freedom or discretion in determining the methods and circumstances of learning. The learner determines when and where to undertake the studies. Much of the learning that takes place in the business environment is self-directed, because workers often cannot wait for a scheduled class to obtain the information they need. Similarly, college professors employ self-directed learning when they study and publish on a subject of academic interest.

Classifying Learning Environments

By classifying and defining different kinds of teaching and learning styles, we are better equipped to create environments which will support them.

A model

The two attributes of collaboration and self-direction can be combined into a two-dimensional model to better understand types of learning environments. Examples illustrate how the teaching/learning approach varies with the degree of collaboration and self-direction.

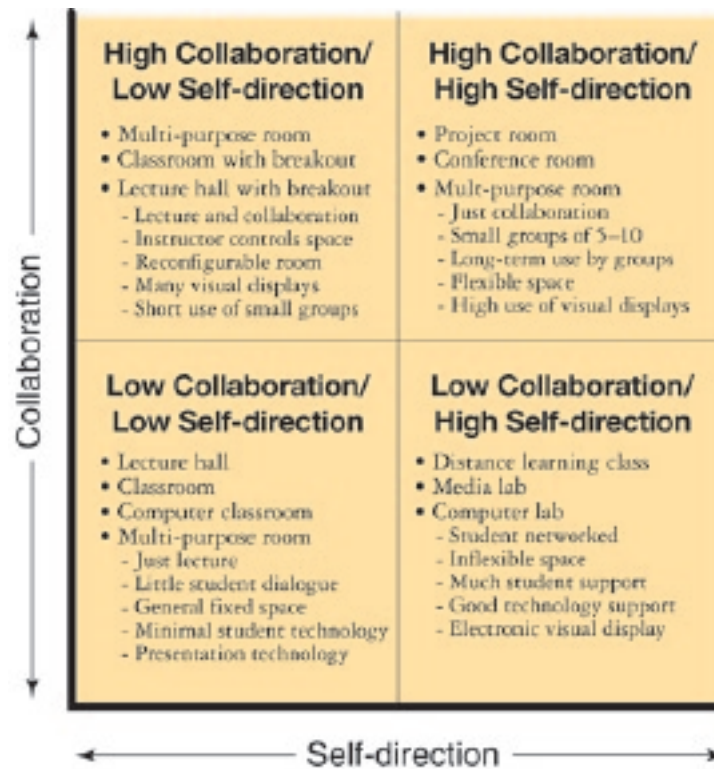


How Space Supports Learning

Organizations increasingly are coming to realize that physical space is a critical, and often overlooked, factor in success.

Matching space and style

Learning environments come in all shapes and sizes. Using the model, Steelcase categorizes these in terms of how they support teaching and learning. Just as a podium doesn't double as a conference table, the space that works for a traditional lecture won't automatically work for a collaborative team study.



“Schools, universities and training rooms were designed with an industrial age, factory model. These fixed, one-size-fits-all environments do not support all the ways we teach or all the tools we use. However, when customized with supportive tools and furnishings, they can shape and encourage the kind of learning that an organization seeks to promote.”

Paul Cornell, Ph.D., Director of Human Factors and Cognitive Environments, Steelcase Inc.

New Environments for Learning

One size does not fit all. The diversity of teaching and learning styles employed in educational institutions and learning organizations today demands a range of learning environments.

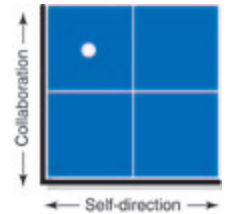
Some examples

To provide the most functional space for learning, it's important to consider the general attributes of the space in light of the teaching or learning style, furnishings, and required tools.

Environments for high collaboration, low self-direction

Classroom with Breakout

The classroom with breakout supports lecture, presentation, note taking, guided discussion, and small-group breakouts. Furnishings designed to move easily can be rearranged by students to suit different needs within one class session. Chairs may stack to allow greater floor space flexibility. Whiteboards or chalkboards allow the instructor to post notes and directions; basic projection equipment supports presentations. A video player/monitor on a mobile cart may serve several classrooms. This space supports traditional instructor presentation and breakouts for 15 to 40 people.



Lecture Hall with Breakout

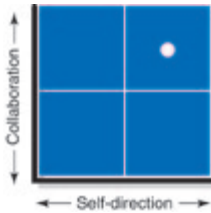
For instruction on a large scale, this facility provides traditional lecture hall capacity with added flexibility for small group breakouts. Rather than anchoring seats to the floor on narrow tiers, the space is designed to accommodate tables and chairs and mobile visual displays that can be moved for small-group activities. Sound and projection systems are designed for the large group. This space accommodates traditional instructor presentations and breakouts for 50 to 200 people.



New Environments for Learning

(continued)

Environments for high collaboration, high self-direction



Breakout Room

For small groups, the breakout room offers privacy for short-term group work or learning, usually in the context of a larger group session. Rooms are often adjacent to the large group facility. Furnishings include tables, chairs, easels, and whiteboards. This supports brief small group collaboration for five to seven people.



Project Room

For long-term teams and special assignment task forces, the project room offers privacy and a dedicated space for a period of time. Furnishings include tables, chairs, equipment carts, and easels. Desktop or laptop computers, computer projection, and whiteboards are essential. Project rooms support intensive small group collaboration for five to 12 people.



Conference Room

In a traditional corporate environment, the conference room is furnished with one large table and comfortable chairs, supporting meetings and collaborative work sessions of two to 25 people. The conference room may also be furnished with modular, flexible tables that can be rearranged for breakouts. Whiteboards, tackable surfaces, computer projection, and video equipment add to the functionality of the conference room.



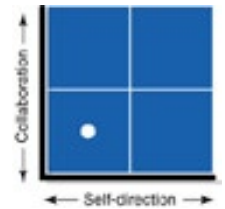
New Environments for Learning

(continued)

Environments for low collaboration, low self-direction

Classroom

The classroom supports lecture, presentation, note taking, and guided discussion. Chairs may have tablet arms to maximize occupancy. As an alternative to tablet arms, tables may be used. Whiteboards or chalkboards allow the instructor to post notes and directions; basic projection equipment supports presentations. One video player/monitor on a mobile cart may serve several classrooms. This space supports traditional instructor presentations for 50 to 200+ people.



Computer Classroom

This learning environment, equipped with multiple computer stations, supports computer-based training programs, software instruction, or on-line learning with an instructor. Adjustable worksurfaces or keyboard shelves, palm rests, mouse pads, and adjustable chairs accommodate a wide range of user sizes and proportions. Projection systems are tailored to user needs. Room arrangement provides line of sight to the instructor. This space supports computer-based learning for 15 to 40 people.



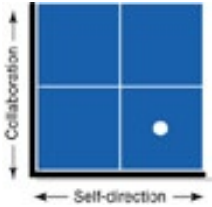
Lecture Hall

Traditional lecture halls accommodate instruction on a large scale. Seats are often anchored on tiers; integrated writing tablets allow higher density. Sound and projection systems are designed for the size of the group.

New Environments for Learning

(continued)

Environments for low collaboration, high self-direction



Distance Learning Room

This dedicated learning environment is outfitted with two-way audiovisual, computer, and/or data equipment. The camera requires fixed positions for chairs and desks. Large displays are positioned to be seen easily by all users. This space supports two-way electronic transmission for 10 to 30 students.



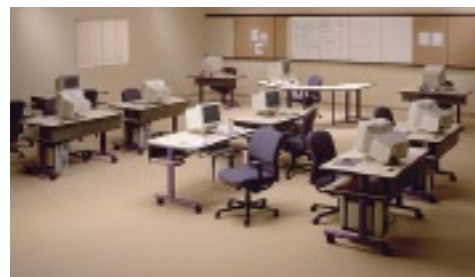
Media Lab

This library-like space is rich with interactive media opportunities: computers, Internet ports, and electronic reference materials. It may be complemented with traditional resources: books, periodicals, and encyclopedias. Tables and chairs support a range of computer and paper-based tasks. Ambient lighting provides glare-free screens and shadow-free paper work areas. This space supports use of multiple media; variable sizes.



Computer Lab

The lab, equipped with multiple computer stations, supports individual computer-based training programs, software instruction, or on-line learning. Adjustable work surfaces or keyboard shelves, palm rests, mouse pads, and adjustable chairs accommodate a wide range of user sizes and proportions. This space supports individual computer-based learning for 15 to 40 people.



New Environments for Learning

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Environments serving multiple learning styles

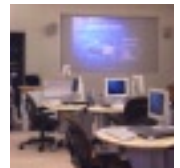
Multipurpose Room

In a multipurpose room, the teaching style can vary: lecture, presentation, discussion, collaboration. Furnishings must be flexible and cross-functional: tables double as desks for note taking, conference tables for collaboration. Chairs are adjustable to suit a variety of students through long hours of sitting. Mobile easels accommodate small group breakouts. Whiteboards around the room encourage recording of work progress and group notes. Overhead projectors, computer projection equipment, and video players and monitors provide presentation support. Conveniently located electrical and voice/data receptacles ensure ample support for laptops and modems. Multipurpose rooms support a variety of learning needs for 15 to 40 people.

Environments for team learning

In an effort to investigate how work environments affect team performance, Steelcase developed a partnership with The Collaboratory for Research on Electronic Work (CREW) at the University of Michigan. In a pilot study, student software development teams who worked in dedicated project spaces practiced persistent information principles and completed their projects while spending only half as much time in meetings as the groups without dedicated space.

In a similar study at IBM, researchers Taylor, Karat, and Bennett found that when groups used flip charts to summarize their ideas, groups increased the number of ideas incorporated in their final decision. Taylor, Karat, and Bennett concluded that the use of large surfaces to display information encourages both breadth of view on issues and an in-depth focus on details for those taking part in the meeting.



Steelcase University Learning Center

Equipped with state-of-the-art technology and work tools, this facility showcases the future of learning environments.

New Environments for Learning

(continued)

Environments for team learning

The studies suggest that the same group, given different learning environments and tools, will achieve different results. With no dedicated space, teams may expend time and energy daily, seeking a place to meet and learn. With no vertical writing surfaces, they may be unable to synthesize the thoughts and ideas shared. Inadequate space may actually impede their performance.

A dedicated group learning environment, however, can effectively function as a mediator... promoting interaction, channeling dialogue, leveraging individual and group performance. Moveable tables and adjustable chairs allow extemporaneous breakouts. Whiteboards or flip charts enable more effective facilitation of discussion. The ability to keep group notes posted and readily available boosts memory and performance.

In a follow-up CREW study, researchers found students in a control group — those not assigned dedicated space — did not comply with directions to share space. Those students who valued dedicated project space “claimed” it... skewing study results, but validating the notion that dedicated space was important to their team process and project results.

A Quick Summary

A study of teaching and learning styles — and how they can be supported by the physical environment — further helps leaders encourage optimal thinking, learning, and knowledge conversion.

Life-long learning, continuous learning, self-directed learning... all are important concepts found in contemporary business and organizational literature, but many organizations are still sorting out how to effectively support learning.

The work of Harvard's Howard Gardner helps organizations — from education institutions to business conglomerates — understand the roles individual differences play in learning and in performance. By considering the different “intelligences” that individuals bring to a class, a project, or a business endeavor, leaders are better able to leverage individual and group learning achievements.

The use of appropriate learning environments, designed to support the appropriate degree of collaboration and self-direction, is key to promoting learning within any school or organization. As new interactive technologies and multimedia training programs emerge, the role of the environment becomes even more important.

New learning environments are not designed to replace all traditional classrooms and conventional lecture halls; these facilities continue to be functional and appropriate for some styles of teaching and learning. New learning environments simply provide more options. For, as we evolve our processes and programs to meet the requirements of continuous learning, self-directed learning, and collaborative learning, we must evolve our environments as well.

The need for learning is a basic fact of life, a fundamental rule of business,
and a critical element of success.

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