

Informal Learning

Informal learning is a late 20th century term referring to widespread practices of knowledge and skill acquisition undertaken by individuals and groups studying and experimenting outside formal settings and instruction. Known by other terms, such as *experiential*, *transactional*, or *lifelong*, these learning practices have prevailed throughout human history. Apprenticeships have fostered the individual talents of hunters, blacksmiths, illustrators, printers, ironworkers, mechanics, and medical technicians. Stories of auto-didacts and self-taught geniuses populate the annals of religion, science, and the arts. The creative productions of self-taught craftsmen and artists fill museums and theatres of the world. Common household conveniences as well as technologies behind power supply, communication, and transportation have resulted from the independent experimentation of individuals who took their curiosity and drive beyond what they had learned in formal schooling.

Diverse methods, models, motives, and outcomes characterize voluntary or informal learning. No gender, age, race, ethnic group, organization, or period of history has more claim than another on informal learning. The valuation of such learning depends on context, need, agency, will, and access to opportunities to practice, experiment, find guides and critics, and reflect on one's mistakes and accidental discoveries as well as advances and achievements.

This entry interchanges the terms *informal*, *voluntary*, and *self-directed* throughout all sections. The entry's first section explores theories of voluntary learning. Following this review is a history of voluntary learning that illustrates its evolution, particularly in relation to the rise and spread of formal schooling and more recently of digital media. The entry closes with a brief look at methods for the study of informal learning and prospects for such learning in the future.

Theories of informal learning

Historians of science and art, as well as social scientists, examine practices of informal learning in laboratories and studios, as well as within the dedicated independent learning of amateurs in field archaeology, family and local history, ornithology, citizen science, and community garden development. Social scientists have shown that voluntary learning calls on a wide spectrum of methods and contexts through which learners acquire and advance their skills, knowledge, and sense of direction toward goal achievement. Fundamental to all points along this spectrum is the human capacity for curiosity — the desire to know and do beyond what is given, immediately evident, or within current practice. This desire for learning motivates individuals and groups to recognize potential within situations and to take risks in order to engage available resources in the process of exploring what one can learn by seeing and doing. Visual acuity and direct experience, along with a high tolerance for trial and error and repetition of activities and experiments, provide the foundations of self-direction in learning.

Researchers studying laboratory and studio life have documented the extent to which non-directed learning co-occurs with high attentional focus on chosen models or situations and keen observation and awareness of environmental resources relevant to learning goals. Voluntary learners are mental gleaners who discern, sort, and assess whatever crosses their path that could potentially become useful information, support, or impetus for self-correction. These learners value experience and action over verbal explication; they rely on intent sustained observation, careful imitation, creative adaptation, and repeated practice toward advancement of skill levels. They

mark the course of their learning by the degree to which they gain a comfort level in the role(s) associated with their area of advancing achievement. They select associates, tools, spaces, and resources that reinforce their sense of being “like those” Who also Work to learn independently and value their own means of getting better at what they do. Self-directed learners take pride in thinking in ways that differ from routine approaches. They have a special genius for identifying problems and potentials that others cannot see and for expanding knowledge as they test possible solutions. These learners have a driving sense of envisionment that enables them to play with ideas and materials and to imagine, test, collect, consider, and refine techniques.

The revolutionary changes in digital technology that took place in the late 20th century brought self-taught independent learning into celebrity status. Individuals who created highly significant break-throughs in the World of information technology represented themselves as loners and dreamers who puttered in garages and isolated settings, trying and testing unique combinations of ideas and techniques. The best-known individual early creators in the world of computers, such as David Packard and William Hewlett, Steve Jobs, and William Gates, went beyond what they had been taught. Creative individuals, such as Steven Spielberg and George Lucas in the world of filmmaking, did the same. Their widely told stories of relying on their creative envisioning of what could be possible to guide them lay the narrative groundwork for the prevalent idea that within corporate and research centers of technological exploration, workers need time and space for self-directed learning. Corporations such as Google developed in their organizational framework an ethos of voluntary learning by individuals and small groups. Specific dictates of task, time, or setting would not be allowed to crimp the creative imagination of individuals Working in markets dependent on constant innovation to maintain their competitive status.

Theories of independent, voluntary, or informal learning that relate to setting and behaviors come from historical and social science studies. Cognitive neuroscientists use fMRI technologies to study the brain’s activity during the experiences that independent learners use to train their body and mind, select their resources, and develop their specialized practices of observation, experimentation, envisionment, enactment, and embodiment. Examinations of cognition in practice explore topics such as consciousness, thinking and seeing, mental modeling, emotional responses, and intentions and intentionality in self-directed learning.

History

Key to self-directed learning is a guiding sense of the need to achieve something, make events happen, and to change one’s own state of being or role. Since the beginnings of recorded history, tales have come forward about the auto-didactic prowess of great statesmen, military and spiritual leaders, artists, and scientists. Before the institutionalization of learning through religious institutions and nation-state political systems, self-direction was the primary means by which individuals found for themselves guides and teachers, resources, and routes to positions in which they could channel what they saw as their special talents and interests.

From ancient India and China, stories tell of great teachers dedicated to the preservation of collective wisdom (often through collections of aphorisms), bodies of philosophical or religious knowledge, and grammars of specific languages believed to be the highest variety of regional tongues. Oral transmission provided the primary means of enabling one generation to pass to the

next information and particular craft skills believed to have qualities and character essential to the group's continuity. Sculpture, architecture, seasonal rituals, costuming, and public celebrations of coronations, feats of war, and funerals provided incentive and means of learning for individuals among the common people — those without royal blood, land, or financial resources. Quests for great teachers, models, and guides, and the fortune of good apprenticeships enabled the most ambitious and talented to move into positions that allowed them to gain recognition and alter their social positioning.

Archaeological evidence from Africa, China, India, Greece, and the Americas suggests the extent to which astronomers, stone masons, and metal workers, as well as cartographers and textile artists, learned through trial and error, repeated practice, guidance from experts, and the imperative of need. Anthropologists, in their studies of groups whose ecological and navigational expertise has exceeded that of Western or academically-legitimated science, demonstrate the extent to which local experts have for centuries passed on this expertise through guiding the participation of the young. Transmitted largely through demonstration and opportunity for trial and error as well as extensive practice, these bodies of knowledge relate to health and medical plants and practices and land formations, climatic changes, water routes, and celestial bodies. Public events, such as rites of passage and seasonal festivals of music, dance, and visual arts, reinforce the importance of skills and knowledge that explain history, ideology, group membership, and means of sustaining the character of the group.

Religion, writing, schools, and the printing press

Around the world, religious teachings have inspired self-directed learning, often leading to the development of specific sub-groups of different religions and the creation of collections of wisdom from venerated individuals, some of whom were also political leaders. Sumerian cuneiform writing, created around 3000 B.C., appears to have recorded first laws and administrative accounts, but within the first thousand years after its development, writing provided hymns of praise, histories of feats of the gods, and records of the dead. The Torah, Psalms of King David, and clay tablets of Moses provide evidence of early beliefs in the power of writing to preserve allegiance to political leaders and deities as well as to provide accounts of the songs of praise, sadness, and remorse by leaders such as David. Use of all these sources relied on informal learning for centuries.

The influence of religious leaders such as Mohammed, Buddha, and Confucius was initially transmitted through oral traditions before being collected into bodies of written literature between 1000 and 500 B.C. when systems of writing developed in different parts of the world. Throughout the medieval period, scribes learned to create illustrated manuscripts through intently studying prior illustrations, observing masters, and imitating as they copied and created the vignettes that accompanied written texts. The work of scribes may be thought of as the first records of the human faith in the self-directed power of individuals to undertake self-reform and new directions in belief and behavior as a result of “teachings” of great individuals. Across the centuries, interpretations of these writings remained inspiration and impetus for learning among both elites and commoners. The rise of Judaism and Christianity came along with standardization of Aramaic, Hebrew, and Latin, and other languages designated as chosen tongues for written forms of religious texts. Temples gave way to smaller edifices that offered enclosed spaces for storing and studying religious texts as well as large indoor spaces for the assemblage of those who came to hear expositions of religious texts and choirs singing ancient hymns and to observe the

lives of religious figures illustrated in mosaics and stained glass windows. The history of Christianity emphasizes the founding of the church as the creation of both an edifice and a membership of believers willing to study Scriptural stories with only occasional instruction by a designated teacher.

The coming of the university

As early as the 6th century A.D., the linkage of designated physical structures and members of a body listening to chosen individuals as interpreters of written texts led to the creation of Christian cathedral schools, sometimes called monastic schools. From these came the university which brought together a community of teachers and scholars, referred to in Latin as *universitas magistrorum et scholarium*. From the 11th century when both the University of Bologna and Oxford University were founded, universities exerted their rights to determine the courses of study and language, promote research and its objectives, and award degrees to mark levels of achievement through formal study. The spread of universities from Medieval Europe throughout the world carried with these institutions designation of the primary areas of study as philosophy, arts, sciences, and humanities plus theology, medicine, and law. Within universities and religious institutions, sacred texts and those designated for study were available in vernacular languages from the 16th century forward.

An unchanging set of formal procedures came to mark education and what it means to be schooled. Skills of logico-linguistic reasoning increased in importance as the means for gaining power and demonstrating intelligence. From the earliest days of universities, only the elite could be chosen to become teachers or to enter universities as scholars and to prepare to live without having to labor. To be common and unschooled meant one had to labor as worker, soldier, sailor, craftsman, merchant, agriculturalist, builder, or explorer. Around the world in all stages of schooling, students as novices gathered in front of experts who lectured from and toward textual knowledge. Students demonstrated what they knew of the matters in which they had been instructed by rendering their knowledge through prescribed forms of oral recitation and written representation. Until the closing decades of the 19th century, the primary means of rendering such knowledge was through oral recitation and prescribed performances, such as the defense of the dissertation at the culmination of study toward a doctoral degree.

By the end of the first few decades of the 20th century, selected written genres, such as the essay, case, brief, article, and monograph, became preferred means of displaying the range and substance of one's knowledge. Academic leaders believed skills in verbal expression, oral and written, or level of articulateness equated with extent of knowledge and intellectual prowess. Saying what one knew came to be far more important than showing what one could do. This evolution meant not only that engaging in manual or menial labor excluded one from achievement of elite status, but also that ways of gaining skills outside the academy and across lifelong learning went largely unnoted.

The 18th century

In the 18th century oral-visual knowledge mattered. In England and throughout Europe, royal societies sponsored evenings of conversation about the meaning of natural curiosities explorers brought back from the seas, lands, and societies of distant worlds. Libraries of these societies col-

lected the increasingly available maps of different parts of the world and illustrations of botanical and zoological specimens as well as mathematical and navigational instruments. Fashionable social gatherings centered in conversations stimulated by cabinets of curiosities, collections of paintings in museums and galleries, and the increased circulation of books of illustration. These social means of learning derived from the notion that individuals learn most effectively when projects engage sensory learning. Public intellectual figures celebrated intuitive ways of knowing that fostered invention of new tools and means of experimentation in science.

Learning grew to be popularized as ways of seeing. Museums, with endless displays that inspired optical cabinets in homes, as well as the widespread peddling of illustrated children's books and popular books and magazines for adults, brought about a form of public pedagogy in which individuals could relish learning by looking. Throughout Europe, the middle class expanded throughout the 18th century, as merchants, explorers, scientists, artists, craftsmen, and designers, as well as civic workers came to have discretionary time and money to use for their entertainment and the improvement of their homes and surroundings. In doing so, they sought out models and specimens from around the world. They consulted museums, illustrated garden and home decoration books, and public exhibitions of gardens and home decoration. Lectures evolved as popular forms of entertainment in regional theatres and state buildings, as well as museums, and no experience in the scope and sequence of formal education was required for admission.

Simultaneously, the grip of religion and formal regulation on what could and should be known weakened as science came to be a matter of popular fascination. Europe and the Americas were entering the industrial revolution, and machines, experiments, and explorations of new lands exploded across the periodical presses of these nations as topics of general interest. Artists, such as the English painter Joseph Wright (known as Wright of Derby), captured the drama, mystery, and emotion of scientific experimentation, while botanical illustrations and the birth of photography widened the public's access to people, places, and phenomena previously accessible to only the elite. The Royal Society of London and its counterparts in other capitals of the world democratized their earlier iron grip on acceptable science, and as they did so, individuals and other groups without credentials increased in number, influence, and general appeal to the practical interests of citizens of all classes. From lightning rods to electricity to photography, popular science came to be recognized as responsible for inventions that could do everything from preserve visual images to reduce destructive forces of nature and the need for time-consuming labor. Ocular instruments, from improved eye glasses and telescopes to hand-held magnifying glasses, shaped access to information for a growing portion of the populations of economically advancing nations around the world. These inventions led to new kinds of manufacturing, widening markets of consumers, and increased use of optical technology in fields that ranged from medicine to botany to astronomy. Oral-visual engagement dominated in the pleasures, work, and learning of the 18th century.

19th and 20th century developments

Universities in the 19th century shifted from their earlier emphasis on oral recitation to written representation. By the end of the century, as compulsory education became more common in economically advancing nations and more students entered university study, standard textbooks, routines, and means of assessment came to be seen as critical gatekeepers in formal education.

The 18th century's appreciation of oral-visual culture eroded with the force of schooling that insisted on text-centered learning for all.

The industrial revolution and most especially the spread of electric power made possible an explosion of manufacturing. Sweat shops in which handwork had produced goods gave way to factories that employed individuals in routine piecemeal repetitive labor under harsh conditions. Internal and cross-border as well as trans-Atlantic migration of labor brought groups from widely differing ethnic, national, and cultural backgrounds together in urban centers and in massive engineering projects, such as the creation of the subway systems in New York, Paris, and London. Discoveries of gold and increased extraction of minerals, along with the need for extended rail transportation systems, increased employment opportunities. These projects needed not only those willing to do the lowest and most dangerous forms of manual labor, but also foremen and engineers who headed up the hierarchical structures that became common to manufacturing and construction. Those at the bottom had little opportunity to look and learn from experts to whom they could become apprentices. Architectural designs, engineering plans, and layouts for distribution systems called for specialized training in reading structured symbol systems, including technical language.

Learning to interpret structured symbol systems, such as alphabets or numeral systems, requires some direct instruction, whereas exploration, craft work, and scientific and artistic experimentation can be learned by observing and taking part in guided participation. Those with little or no literacy who determined to leave manual labor in manufacturing, mining, and construction turned to adult education. In the United States, where the institution of slavery had kept Blacks locked in manual labor since the colonial era, free blacks and former slaves found ways to teach themselves to read, establish reading groups, and build libraries in cities such as Philadelphia. These individuals and groups took up practices of self-directed learning and sought guidance from experienced readers whenever possible.

Adult classes enabled study in formal settings by those who had little prior schooling and often little knowledge of the national or standard variety of language of their current place of residence. Many of these adults had extensive life experience "in the trenches" through which they could make the most of their literacy skills within trade and manufacturing, enabling them to accumulate sufficient capital to enter the middle class. They had lifted themselves up by hard work and a sufficient amount of formal schooling to enable them to use their life experience to raise their economic position. These parents resolved that their children would not labor as they had but would secure the benefits of formal education so that they would never have to learn by seeing and doing. Their children would excel in school in order to gain knowledge and skills that were, in essence, invisible, but held to be essential to one's legitimation as an interpreter of texts. Reading and writing came to be valued as the highest reflections of achievement and the means of learning through which one "earned the rights and responsibilities" that came along with the awarding of a university degree.

Over institutional walls

By the final decades of the 20th century, however, the confidence that modern economies had placed in formal education wavered. In addition, families as fundamental inspiration and support for effective participation by the young in formal schooling were no longer predictably reliable. Diversities of household arrangements resulted when two parents needed to work outside the

home or when divorce, sickness, or death left only one parent as economic, moral, and emotional support for the young.

Employers now complained that even workers with university educations could not successfully meet industries' demands for creative critical thinkers. The science behind top moneymakers in the corporate world — computers, biotechnology, communication, global finance, and energy production — was changing rapidly. Research and development took place less frequently in separate facilities and institutions, and more often on the corporate job in the midst of high-demand tasks and calls for on-going innovation. If they were to succeed, workers had to bring to the workplace all that marked voluntary learning or experiential learning.

Some secondary-school and even university graduates turned to service jobs and sometimes to manual labor. Some became apprentices to experts who worked with their hands. Fiber optic technicians, transportation workers, medical and dental technicians, electricians and plumbers, and repairmen for power and communication lines grew in demand in modern economies. Individuals who could read, handle mathematical calculations, and maintain self-discipline and commitment could learn informally after short-term training and formal instruction. Most of what had to be learned was “on the job.” Here theories and practices of informal learning had to become operational.

By the opening of the 21st century, students enrolled in primary and secondary school in modern economies found their after-school hours regimented within extended school days, sports teams, or a host of scheduled lessons and activities in community organizations. Descriptive terms captured the goals of these kinds of learning beyond the classroom: *extended learning*, *extra education*, *supplementary education*, and *out-of-school or after-school learning*. The number of weekly committed hours in these activities by students often matched the number of working hours of their parents. Time for hobbies, free play, free-ranging exploration, and self-directed learning disappeared from childhood in modern economies.

Digital media experimentation for those supplied with technological access became the major form of voluntary learning. As these technologies became more widely available in homes as well as offices, adults realized that the young learned more and faster than their elders. The knowledge and skills of children outpaced the competence of adults who saw the young undertake fearless experimentation with technologies, often pushing these beyond what manufacturers had envisioned. Thus informal learning emerged as oppositional to formal learning, for the expertise of the young seemed to grow increasingly independent of authorities and to require no expert adult, curricula, or external forms of assessment. Long-standing expectations for transmission of skills and knowledge from elder-as-expert to child-as-novice had been turned on its head. Yet nations with state systems of schooling and compulsory education continued to place primary emphasis on formal schooling and to leave informal learning or any learning that might go on beyond the classroom to *ad hoc* forces and agents.

However, experts in youth development saw what changes in the labor force meant for the traditional roles that families had played in child and youth socialization. Community organizations, especially those devoted to political action and civic learning, the arts, environmental sciences, and community development, organized in some parts of modern economies in order to ensure that working mothers would know their children were safe and happy during their out-of-school

hours. These organizations created innovative means to bring science and art learning together in social entrepreneurial ventures in which the young could earn funds to support the work of their groups. Adults from a wide range of professional fields either worked or volunteered in these community organizations, providing the young with close-up opportunities for apprenticeship, critique, and access to articulate knowledgeable specialists often likely to have benefitted themselves from self-directed learning. The phenomenon of community citizenry quietly became the visible epitome of informal learning freely sought and usually freely given across a wide spectrum of activities beneficial to society.

Employers in cutting-edge software development emerged as keen supporters of the exploratory creative learning of young people, and in some geographic regions, corporations set up learning laboratories in conjunction with science or art museums. These settings offered opportunities for independent exploration of technologies, the devising and testing of ideas with experts from professional fields, and creation of software programs and ideas for hardware development. In many modern economies, corporations (such as Intel) sponsored science fairs that enabled them to identify highly creative young people who evidenced a commitment to self-directed learning.

Methods of studying

Scholars in the learning sciences and psychological and social sciences have centered their attention on four arenas of informal learning: early child development, experimental settings, classrooms, and individuals and groups who have difficulties with social maturation or learning delays. Early child developmentalists, aided by cognitive neuroscientists, carry out most of their studies within the children's homes, observing interactions with toys, play, books, and playmates. Often aided by experimental studies, these scholars demonstrate the social foundations of learning: the "scientist" orientation of young children that leads them to explore, test, discover, and remember; and the critical role of rich language input (ideally from two or more languages) in the early years. Infants sustain their attentiveness, visually follow the actions and eye gaze of those around them, and use their hands to participate with others whenever possible. In doing so, they illustrate the social foundational nature of voluntary learning. With maturation into toddlerhood, children show their capacity for imitation that quickly takes them to creative renderings of the actions of models and guides around them.

During middle childhood (from school entry through the primary grades), children focus on peer interactions and assessments. Imitation works as social control, with individual variations in dress, manner, and adoption of a compliant student role highly dependent on the nature of the school as cultural context. Casual language input during these years, particularly from written materials, expands the life experience of young learners as well as their capacity for negotiation, hypothetical thinking, and explanation of situations in which they are not key actors. Critical during these years is rich language input during joint play or work projects within groups of different ages and levels of expertise. Such occasions include independent neighborhood play groups, building and gardening work meaningful to the household, and explorations of the natural world. Within these situations, learning takes place without direct instruction toward specified levels of achievement but toward the goals of work or play. Language is open-ended, mistakes are made and repaired or glossed over, and ambiguities, disappointments, and pleasure come in unexpected ways. Within urban and suburban areas of modern economies, play is highly supervised and rule-governed (particularly in sports and arts programs), sports and arts, and exploration, creativity, and inclusion of tasks related to the world of adult work tightly controlled by governing adults.

Rural environments and communities in the developing world involve the young in the full daily life of families, because their labor is needed and valued. Learning by doing comes most easily in situations where the young can take part directly in the on-going rhythms of work as well as play.

In the early 21st century, both neuroscience and computer science have increased attention to means of learning beyond those sanctioned in formal learning. Human developmentalists focus on lifelong habits of self-directed or voluntary learning that emerge in early childhood. These habits rely on the sustained attentiveness of intent observation that lead to effective mimicry and imitation as well as independent exploration and creativity. Play, when free from external direction, offers the best laboratory for studying both individual experimentation in voluntary learning and the social foundations of learning. Throughout the life span, individuals and groups engage in joint play and creative projects, experiments, and adventures in which they develop and try new ideas and innovative practices. Recreational and leisurely pursuits linked with hobbies, special interests and needs, new personal contacts, and serendipitous occurrences demonstrate the continuous paths of voluntary learning through the life course. Though infrequently acknowledged, formal and prescriptive learning environments such as schools and work places benefit when individuals and groups bring to bear their informal learning habits on prescribed curricula and courses of action. Scientists and artists attribute their creativity and innovative thinking to informal ways of learning by means of observation, trial and error, imaginative and contrarian thinking, and visualization.

Prospects

As the term “knowledge society” becomes more widely acknowledged in modern economies, the practices of research, expertise development, exploration, invention, and discovery by individuals outside and beyond formal education will draw increased attention from not only behavioral and cognitive scientists, but also political theorists. As leaders in democratic nations increasingly turn to citizens for their voluntary help in maintaining the social and moral fabric of the nation, the field of voluntary learning — in one’s own time and manner -- will draw more attention from scholars. In addition, as citizens dedicate their attention and activism to specific problems, they will also undertake research formerly considered the domain of only universities. Voluntary learning will also be called for as institutions and organizations such as schools, libraries, and social service bureaucracies find that their financial and human capital resources cannot meet citizen needs. Throughout modern economies as well as developing nations, citizens have for decades voluntarily sustained the cultural commons or public festivals, seasonal parades, and holiday events; they will increasingly be called on to sustain and increase these efforts. Informal self- and group-directed learning will be needed to ensure that each successive generation of local citizens will rise to meet the technological demands of advertising cultural events and providing visual records of these occasions as learning materials for those who follow.

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