Emerging research findings demonstrate a relationship between learning styles and approaches to using the World Wide Web and other hypermedia, especially in terms of success with information retrieval. One of the most widely used conceptions of learning styles is Witkin's Field Dependence (FD)/Field Independence (FI). FI individuals perceive details and rely on internal cues, whereas FD individuals use their entire surroundings, including other people, to process information. Although most research findings show that FI's perform more efficient searches in less time and are more comfortable with "surfing" in hyperspace, FD's can use hypermedia as efficiently as FI's can, provided their learning style preferences are accommodated. Accommodations include providing a site guide or a global overview (for example, menus listing all possible choices). Other variables affecting information-seeking processes include the following: motivation; perceived importance or value of information; prior computer experience or subject knowledge; degree of self-direction; and knowledge of interface. The key is to recognize the implications of one's preferred learning style, know how to select and use hypermedia tools to match one's style, and learn to create mental models and use metacognitive strategies. (Includes an annotated bibliography of 22 print and hypertext publications, which comprises more than half of the document.)

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Learning Styles and Electronic Information
Trends and Issues Alerts

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Learning Styles and Electronic Information

It has been said that the World Wide Web and other hypermedia-based systems are modeled on the way the brain processes information (Ayersman 1993; Kussrow 1997; Small and Ferreira 1994). Individuals process information by using distinctive patterns known as learning styles to select, organize, and store it. Emerging research findings demonstrate a relationship between learning styles and approaches to using hypermedia, especially in terms of success with information retrieval. This Alert highlights some of these findings and provides an annotated list of resources so that adult educators can help learners make the best use of electronic information.

Among the most widely used conceptions of learning styles is Witkin's Field Dependence (FD)/Field Independence (FI). Much of the hypermedia research compares IT individuals, who perceive details and rely on internal cues, with FDs, who use their entire surroundings—including other people—to process information. Although hypermedia integrates aural, visual, and textual elements that accommodate various learning styles, most findings (Chou and Lin 1997; Cline 1991; Hsu et al. 1991; Kim 1997; Leader and Klein 1994) show that FDs perform more efficient searches in shorter time and are more comfortable jumping around (“surfing”) in hyper-space. FDs more often report feeling disoriented or lost, navigate more linearly (frequently using back or home keys), and tend to follow sequences instead of jumping around, accepting the environment as presented. This may be because FDs use active approaches such as hypothesis testing; form mental models of how the Internet is constructed and information is organized, revising them continuously; use metacognitive strategies (planning, monitoring, reflecting, regulating); and transfer concepts and search methods to new situations. FDs prefer to be guided and want a global overview, such as explicit menus listing all possible choices (Chou and Lin 1997). Liu and Reed (1994) found that both FDs and FDIIs perform well, but approach the task differently.

Other variables affect information-seeking processes: motivation, perceived importance or value of information, self-efficacy, problem-focused or emotion-focused problem-solving styles, prior computer experience or subject knowledge, degree of self-direction, and design of the interface (Grabowski and Curtis 1991; Hsu et al. 1994; Kim 1997; Small and Ferreira 1994). In addition, the use of hypermedia itself can influence the development of different strategies or approaches (Chou and Lin 1997).

Cline (1991) envisions a day (perhaps not far off) when we will carry cards coded with learning style information and individual profiles that we will plug into a machine, which will adapt itself to our preferred style. Until that happens, educators helping adults learn to be lifelong information seekers (as well as designers of hypermedia systems) should bear in mind that the average user learns only what is needed to perform a task (ibid.). "A rich array of support is possible within the information landscape" (Hilligren 1994, p. 37). The key is to recognize the implications of one's preferred learning style; know how to select and use hypermedia tools such as indexes and site maps that match one's style; and develop the ability to create mental models and use metacognitive strategies.

Resources


Provides a conceptual foundation for the development of hypermedia as a tool for addressing learning style differences. Examines information processing theory, semantic networks, concept webbing/mapping, frames/scripting, and schema theory.


Discusses the implications of Hanson, Silver, and Strong's typology of learning styles (sensing feelers, intuitive feelers, sensing thinkers, intuitive thinkers) for the development of multimedia.


Presents a cognitive view of how adults learn to use the Internet and describes a practice-oriented approach to teaching basic Internet skills.


A study of how managers and information technology specialists use the Web to find work-related information was used to develop a behavioral model that relates motivations (strategies and modes of searching) and moves (tactics used to find information).


Two of four types of navigational maps used in a hypertext system had significant effects on the number of search steps used, search efficiency, and development of cognitive maps. Cognitive style (field dependence/independence) had a significant effect on the development of cognitive maps but not on search performance.


Examines how people interact with information retrieval systems in order to develop a model of a system that accommodates diverse user styles.


Discusses cognitive models that define learning as the accumulation and organization of knowledge structures. Compares these models to the structure of hypermedia systems and addresses ways to maximize learning in hypermedia environments.
Defines holosagogy as a new system of learning and teaching that is based on how the brain processes information and that can accommodate different learning modalities, styles, and intelligences in a culturally diverse, information-based society.


Suggests that performance differences on an information retrieval task of field-dependent and field-independent subjects using different types of hypermedia search tools (browse, index/find, map) may derive from the cognitive style differences.


Use of a hypermedia language-learning environment by nonnative speakers of English revealed differences in approach to the system by field dependent and field independent users. Ways to match hypermedia type to learning style were identified.


Hypertext with network structures accommodated learning styles better than hierarchical structures. Both structures equally accommodated users who preferred observation and those who preferred experimentation.


Computer science students organized a multimedia workshop to give older adult classmates hands-on experience. Design implications for older adults using computers resulted from the findings.


Identified differences in engagement of text and context information, expectation of success, and type of knowledge representation between adults and children and between users of multimedia and print information.


Explores the various definitions of learning styles; different theories (information processing, personality, and social interaction models) and learning style research among diverse groups. Finds that learning styles may follow cultural patterns.

Developed with funding from the Office of Educational Research and Improvement, U.S. Department of Education, under Contract No. RR9302001. Opinions expressed do not necessarily reflect the position or policies of OERI or the Department. Trends and Issues Alerts may be freely reproduced.