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## **Information Processing**

New information technologies—such as computers, high-capacity, random-access data storage devices, tools for graphics creation and display, audio and video recorders, and communication networks—have altered the ways we work, play, communicate, and learn. As a result, information processing can no longer, if it ever could, be seen as distinct from the concerns of English and language arts education. Instead, it is deeply intertwined with issues central to English education, such as theory, new capabilities for representing and communicating knowledge, and new modes of instruction. Each of these areas poses new challenges and opportunities for English education.

Information processing means manipulating symbols to express meaning, to influence others, to preserve experiences, to create beauty. These are essentially the functions of language, and indeed, the discourse of information processing is replete with terms familiar in language learning, such as: *interpretation, representation, relation between symbol and meaning, structure, function, and communication*. This similarity of terminology reflects deeper shared concerns, which are increasingly being addressed from the perspectives of traditional English education in concert with perspectives from the computer and information sciences.

For example, hypermedia authoring systems and interactive fiction blur the author/reader distinction since they allow multiple authors to create a shared hypertext with links from each text segment to interact arbitrarily with many other texts. At the same time, computer-mediated communication, especially real-time communication, blurs the temporary/permanent distinction long held to exist between spoken and written language. Furthermore, new graphics and video tools challenge traditional definitions of written text, as they allow the creation of new symbols, and the intermixing of words, graphics, images, video, and sound. These changes in the way people communicate push those concerned with English education to rethink *writing, text, authorship*, and other basic concepts of language.

Information processing also means new tools for reading and writing. The electronic availability of huge corpuses of text, library card catalogs, databases, and reference materials make these traditional resources much more accessible and easier to search. Electronic networks facilitate information exchange and community building across boundaries of time and distance. Word processors, style and spelling checkers, dictionaries, thesauruses, outliners, and many other tools make writing much faster and easier. Technological support for writing, reviewing, and publishing processes is transforming traditional books and journals. The existence of these and other new technological tools changes both how students learn and what they need to be learning.

New information technologies are changing the ways English and language arts are learned. The largest impact has not been in direct instruction in reading and writing, although important work

has been done in that arena, but in the widespread adoption of tools such as word processors and electronic mail. In fact, word processing for English and language arts, once viewed as peripheral to other applications such as tutorial programs in mathematics, has become the dominant activity in many classrooms and computer labs. Electronic mail, bulletin boards, and real-time communication, in which students converse in writing over a local-area network, are becoming much more prevalent. These new communication environments cut across accepted ways of organizing schools into disciplines and grade levels. For example, one project has students designing a school that could function in a zero-gravity environment, as in outer space. As they develop designs for classroom furniture, new games, clothing, and so on, they write about their designs and share them over an electronic network. Students from second grade through high school interact with each other and with university faculty and NASA scientists as well.

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**See also:** Cognitive Science, Databases and English Teaching