LEARNING ADDS

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LEARNING AIDS

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1. Core Definition and Evolution

Learning aids encompass the extensive variety of materials, techniques, and devices specifically designed and utilized to enhance and facilitate the educational process. Historically, these aids were limited to fundamental classroom materials such as the blackboard, textbooks, workbooks, and printed charts. However, contemporary instruction has witnessed a substantial expansion in this domain, integrating sophisticated media and electronic devices into instructional design. The evolution of learning aids has been driven by both pragmatic necessities--such as managing expanding school enrollments and addressing teacher shortages--and, more significantly, by a refined understanding of how fundamental **learning principles** can be applied more effectively.

In the modern context, learning aids commonly include, but are not limited to, films, closed-circuit television systems, audio recordings, magnetic tapes, slides, film strips, educational games, and highly complex teaching machines. This technological progression has been facilitated by several external factors: closer collaboration between educational psychologists and specialized technologists (such as film producers and electronic experts), the pressing need of the armed forces for rapid and efficient instruction, governmental appropriations enabling schools to acquire new resources, and the growing commercial interest shown by large corporations in the nascent educational technology industry.

2. Underlying Principles and Motivations

The most important justification for the wide-scale implementation of new learning aids lies in their capacity for more effective application of established psychological principles of learning. These aids are intentionally designed to increase **student motivation** through the use of interesting and dramatic materials, ensure stronger reinforcement through the repetition of core content presented in diverse forms, and achieve multisensory stimulation. Furthermore, advanced instructional aids often afford a greater opportunity for active participation and immediate feedback from the student, which is paramount for both skill acquisition and concept mastery.

Motivation Enhancement: Utilizing novel and dramatic materials to increase student engagement and willingness to learn.
Reinforcement: Repeating material in different media or forms to solidify memory and understanding.
Multisensory Stimulation: Engaging multiple senses (sight, sound, touch) simultaneously to

improve retention.

Active Participation: Providing opportunities for students to interact directly with the material rather than passive review.

3. Traditional and Audiovisual Aids

Among the earliest forms of modern instructional aids were educational films and television, both of which were subjects of considerable psychological investigation regarding their efficacy. Studies involving instructional films consistently demonstrated that carefully selected media can stimulate learning significantly. For instance, investigations, such as those conducted by May et al. (1947), found that presentations which elicit **active participation and practice** from the viewer are demonstrably superior to those that provide only passive review. The effectiveness of filmed instruction is further enhanced when the speaker addresses the viewer directly, particularly when demonstrating practical skills (Zuckerman, 1952).

Research also focused on optimizing the combination of auditory and visual cues. In studies examining the learning of technical subjects like meteorology, Nelson and Vandermeer (1953) found that complex technical and numerical data were most successfully learned when pictures were combined with sound, provided the commentator utilized vivid verbal expressions, strategic repetition, and devices to direct the student's attention to specific visual aspects. High-stakes application studies, such as those conducted by the Army Air Force comparing animated cartoons to detailed manuals for teaching flexible gunnery, revealed that the films taught "fifty percent more facts per person per minute" and were particularly effective with students identified as slower learners (Gibson, 1947).

Educational television offers several general advantages, including intriguing students with the medium, allowing for the maximum utilization of the best teachers and teaching techniques, and delivering quality instruction to deprived areas. Investigations have shown that when informational TV presentations are preceded and followed by discussion and individualized instruction, the overall results are generally comparable to those achieved through ordinary classroom lectures and demonstrations. An early college-level experiment at Iowa State University involving a psychology credit course compared traditional classroom instruction with various forms of televised presentation, including watching at home, watching in the studio, and viewing **kinescopes** (films of the talks) followed by discussion. The kinescope-discussion group consistently showed the greatest academic profit, demonstrating the value of integrating passive viewing with active, instructor-led dialogue (Husband, 1954).

4. Computer-Assisted Instruction (CAI)

The emergence of digital technology ushered in **Computer-Assisted Instruction (CAI)**, also

termed computer-based learning, representing one of the most promising and flexible teaching methods. Pioneered for research purposes at institutions like Stanford University, CAI employs sophisticated automated instruction devices far more complicated than traditional teaching machines. This technique involves presenting programmed material, typically of the "branching" variety, where the student sits before a cathode-ray tube, often wearing earphones. A computer instructs a microfilm device to project an image while simultaneously playing an auditory message.

The student typically responds to the message, which usually consists of a test question, by pressing keys on an electric typewriter or touching the screen with an electronic pencil. This response is immediately fed back into the computer for evaluation. The adaptive nature of CAI is its core strength: if the response is correct, the computer moves to the next instructional item; if incorrect, it automatically evaluates the type of error made and branches into appropriate **remedial material**. The system also records the student's progress and difficulties, ensuring that slow learners are branched back for review, while rapid learners are branched ahead at a faster pace or directed toward special enrichment materials to maintain interest (Suppes, 1966; Atkinson and Hansen, 1966). This results in a highly flexible system that automatically adjusts to the unique learning pace and needs of the individual child.

5. Specialized Literacy Aids and Adaptive Devices

A second notable automated-instruction device is the Edison Responsive Environment (ERE) System, a computer-controlled "talking typewriter" developed by Omar K. Moore. This machine teaches reading by presenting letters, symbols, words, sentences, or pictures on a screen while simultaneously pronouncing, spelling, and explaining them. The child sees a particular symbol and must press the corresponding key on the typewriter (all other keys being automatically blocked) in order to see the symbol typed and hear it spoken. This **multi-sensory activity method** has proven effective in the preschool and early school years, and has shown particular value when working with retarded children and youngsters from underprivileged environments.

A significant test of the ERE System conducted in the Freeport, New York, public schools involved an experimental group of twenty five-year-old kindergarten children who were carefully matched with a control group. After five months and an average exposure of less than thirty hours per child, the self-taught experimental group significantly outperformed the control group, despite the latter being taught by exceptionally well-equipped teachers in enriched classrooms. Notably, children with more limited intelligence advanced at the same relative rate as their brighter peers, and the scores of children from underprivileged environments were indistinguishable from the remainder of the group. Further tests suggest that the ERE system may hold considerable value for teaching handicapped children, including the cerebral-palsied, the hard of hearing, and the autistic.

6. Adult Reading Improvement Courses

For older students and adults, specialized courses and teaching devices have been developed specifically for improving reading skills. These programs, such as those offered by the SRA (Science Research Associates) or the Rutgers University-Book-of-the-Month Club Reading Skills Program, aim to improve both reading rate and reading comprehension simultaneously, moving far beyond mere skimming ability. Given that the average adult reading rate is typically an inadequate 200 to 250 words per minute--little more than that of an eighth-grader--these sound courses can often double or even triple the reading rate through structured practice. Studies show that even individuals starting at a relatively rapid rate (e.g., 450 words per minute) can often double their speed, and contrary to popular opinion, these rapid readers often demonstrate **greater comprehension** than their slower, plodding counterparts.

A comprehensive approach is employed in these courses, involving exercises and self-tests across multiple domains: vocabulary building, grasping the main idea and its relationship to supporting facts, rapid scanning, and training the student to read thoughts rather than individual words. A critical feature of these courses is training in **flexibility**--the ability to adjust the reading process based on the nature of the material and the reader's purpose. This training helps overcome the common habit of reading novels, newspapers, and scientific articles at the same, inefficient pace. These programs also incorporate self-diagnosis of common reading defects, such as backtracking and mouthing words, using special exercises designed to alter these ingrained habit patterns.

7. Debates and Criticisms

While structured learning aids and courses provide measurable academic benefits, the field has historically been susceptible to extravagant and scientifically unsupported claims, particularly concerning purported breakthroughs in reading speed. Certain programs have promised reading speeds of 2000 to over 6000 words per minute with complete understanding, often based on techniques like practicing "vertical" rather than "horizontal" reading.

These hyperbolic claims are refuted by definitive scientific evidence regarding the physiology of reading. Spache (1962), a past president of the International Reading Association, cited established limitations, demonstrating that it is biologically **impossible to read faster than 800 to 900 words per minute**. This limit is due to several physiological factors: the requirement that the eye must be fixated to read, the maximum number of words the eye can perceive at one fixation (2.5 to 3 words), and the total time taken by these fixations combined with the saccadic sweep to the next fixation and the return sweep to the subsequent line. Studies carried out by Spache indicated that students trained in so-called vertical reading achieved only modest gains, averaging 400 to 600 w.p.m., with a maximum of 900 w.p.m. Furthermore, when these students attempted to skim at speeds higher than 900 w.p.m., their comprehension levels rapidly fell to 50 percent or

less, invalidating the claims of simultaneous exceptional speed and complete understanding.

Further Reading

Educational Technology (Wikipedia)
Instructional Design (Wikipedia)
Computer-Assisted Instruction (Wikipedia)
Speed Reading (Wikipedia)