The Applied Scholastics Study Technology - A Definition and Brief Description with Comments on the Need for Comprehension Strategy Instruction

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Introduction and Definition of Terms

This paper is a brief review of the literature on academic skills and a description of a unique study methodology, Study Technology, utilized by Applied Scholastics, a non-profit educational group. (1)

For over three decades, Study Technology has been used as a learning method in such diverse locations as public school classrooms in rural Mississippi, Memphis, Tennessee, Detroit, Michigan, Mexico City, and The People's Republic of China. Types of programs include tutorial programs for adult and youth learners; specialized training programs for workplace training, and reading and learning improvement programs in the public schools and federal and State prisons. Developed by L. Ron Hubbard (2) over the course of decades of research into the sources of difficulty in achieving high levels of learning and comprehension, Study Technology is a secular application that is used today by peoples and institutions in a wide variety of cultures and institutional contexts. (Source: Applied Scholastics International Web site: http://www.appliedscholastics.org).

Technology: A Definition

In order to avoid confusion with regard to the name "Study Technology," a clarification of the word technology is essential. When referring to technology in an educational context, an educator's first thought might be to equate the term *technology* with "educational technology." While this term has multiple definitions in the field of education, the most common usage relates to the use of computers in the schools. However, the root of the word *technology* means "systematic treatment of an art or craft," usually applied to practical purposes. (3) It is in this context that the word is used as it relates to the Study Technology. In this sense the term *technology* pertains to the application of specific strategies of study, in order to enhance comprehension.

Background: Academic Skills / Reading Comprehension Strategies-Their Place in the Curriculum

The definition of "comprehension strategy" in *The Literacy Dictionary: The Vocabulary of Reading and Writing* published by the International Reading Association (Harris & Hodges, 1995) begins with this note: "There is little consensus in the research literature on what constitutes a comprehension strategy." Yet, the area of reading comprehension continues to be one of a significant amount of research, since undercutting nearly all subjects is the ability to read and understand. The process that begins with teaching a child to read, then to read with understanding, and finally, fostering that child's progression into reading for application in other content areas is a challenging one. It requires direct instruction from teachers as well as mastery of comprehension strategies by the student (Anderson, Hiebert, Scott, & Wilkinson, 1985; Armbruster, Lehr, & Osborn, 2001).

Sometimes linked with *academic skills* or *study skills*, reading comprehension strategies are generally those that teach the student how to read in order to find meaning within text and also provide the student with "fix-up" strategies to apply when his or her understanding breaks down. These go beyond the rote application of techniques. Applying such strategies requires metacognition on the part of the student-a term defined as the self-monitoring action of "thinking about thinking." Metacognitive strategies empower the student with the academic tools to monitor himself and repair any glitches in understanding while in the process of constructing meaning from text.

In the publication *Put Reading First*, The Partnership for Reading summarized the findings and conclusions of the National Reading Panel's 2000 report, *Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction-Reports of the Subgroups*. Their summary emphasizes the importance of six strategies that have a scientific basis for improving text comprehension: comprehension monitoring, using a graphical means to illustrate concepts (such as a diagram or chart), answering questions, generating questions, recognizing the structure of stories, and summarizing. They also acknowledge the importance of vocabulary instruction (Armbruster, et al., 2001).

Successful application of comprehension strategies requires that the student 1) be explicitly taught strategies, 2) *know how* to apply these strategies, and 3) have sufficient metacognitive ability to engage in self-monitoring to know *when* to use a strategy and *which* strategy to use. (Paris, Lipson, & Wixson, 1983; Stahl, Simpson & Hayes, 1992). The result of the combined mastery of the above three points is that the student "learns how to learn." Essentially, creating successful, strategic, independent, and active readers is the main goal of instruction in reading comprehension strategies (Anderson, et al,1985; Armbruster, et al., 2001).

Both a clear delineation of what constitutes the essential elements of an effective reading comprehension strategy and the methods for how such strategies should be effectively taught to students are sometimes lacking in our schools. The goal of what educators want to achieve is known but what is known less well is how to go about consistently achieving that goal. Pressley found that even with a large volume of research on comprehension instruction, little actual comprehension instruction was occurring in schools (Pressley, 2001).

Moreover, some educators are confused about where and when academic skills instruction fits into an existing curriculum. Such instruction is cross-curricular and enhances competence in all content areas rather than being a separate study or curriculum of its own. Generally, the real need for comprehension strategies begins at grade three, where students begin to read for information in various content areas such as science, social studies, and math, nevertheless, some instruction can, and should, begin in the early grades. This need for adequate comprehension strategies increases in importance through high school and college and even into the workplace (Vacca & Vacca, 1989; Kozol,1985).

Study Technology contains elements of effective reading comprehension strategies. It has been applied broadly in settings as diverse as K-12 education, community college and graduate level university courses, community literacy sites, and workplace training programs.

The Need for Study Skills Instruction

Educational teams in all of the U.S. states have spent years creating state educational standards and benchmarks for grades K-12 (Marzano, & Kendall,1997; Marzano & Kendall,1998). This monumental task involved delineating subject by subject, grade by grade, and in sequential order the subject matter content that each student is required to master. The standards are laid out objective by objective. They are frequently oriented, not only toward mastery of facts or principles, but also by performance objectives or benchmarks (what the student should be able to do, *accomplish* or *perform*.)

Statements of performance objectives take student knowledge of a subject out of the realm of mere factual memorization and put it into the realm of observable application. These objectives, through their use of various action verbs, state that "the student should be able to apply, do, perform, compose, read, write, solve, create," etc. (Marzano & Kendall,1997). Yet, again, how students will be elevated in their knowledge from the merely "knowing about" to reading for application is not so clearly spelled out.

In the published educational standards of many states when one finds reference to academic skills, study skills, or reading strategies the objectives are nebulous, such as: "the student will be able to apply effective comprehension strategies when reading." (Developing Educational Standards website: http://edstandards.org/standards.html). But what these strategies are, where in the curriculum they are taught, and by whom, varies from school to school. Instruction in comprehension strategies is often lacking (Durkin, 1978-1979; Pressley, 2001). While some schools are fortunate enough to have a Reading Specialist who, through training and insight, can explicitly teach reading and study strategies, where such a professional is missing, it becomes the responsibility of every content teacher to facilitate students' comprehension of their subject area (Vacca, & Vacca, 1989).

The consequences of this are substantial. Too often the student who has not been taught sufficient study skills, who cannot focus while learning, or remember, or apply what he has read is labeled "learning disabled" and becomes a "special education" student (Spear-Swerling, & Sternberg, 1996). Even short of this worst-case scenario, the lack of internalized and effective reading comprehension strategies drives students - and, too often, teachers - to an overemphasis on memorization and rote performance. Sometimes this is in order to achieve requisite scores on standardized tests or sometimes simply to pass the grade or course and progress to graduation from school and into college or a career for which the student is then inadequately prepared. Lack of adequate comprehension strategies presents lifelong problems for the learner. It is simply the responsibility of educators to provide the student with intensive, direct instruction and practice in workable strategies.

Thus the development, analysis, and use of clear and effective learning or reading comprehension strategies are a critical factors for education today.

New Solutions for Old Problems

Recently, unique and successful academic skills programs, such as CORI (Concept Oriented Reading Instruction) (Guthrie, Anderson, Alao, & Rinehart, 1999) and AVID (Advancement Through Individual Determination) (Freedman, 2000; Mehan, Villanueva, Hubbard & Lintz, 1996), have emerged from within and outside the schools and have proven powerful adjuncts to fostering student academic performance through intensive instruction in academic skills that address comprehension. This paper will describe another such method, Study Technology.

Study Technology-Basic Principles, Motivation and Engagement and The First Obstacle to Learning

Study Technology is a methodology that seeks to provide the student with three key comprehension strategies. To some, the principles of Study Technology might be considered "common sense" but essentially this is reflective of the direct and fundamental approach of these strategies.

The primary focus is on the student's purpose for study and application. Educational researchers have studied the important issue of a student's purpose and motivation for learning (Good, & Brophy,1978; Guthrie, 2004).

The subject of the keynote presentation at the 2004 annual Research Conference of the International Reading Association was the CORI project (Concept Oriented Reading Instruction)--a collaborative project between the University of Maryland and an elementary school.

Guthrie and colleagues motivated students to learn by linking hands-on science with reading and explicitly teaching eight strategies for reading. Guthrie's conclusion was that "engagement and comprehension are synergistic." Students were engaged because their motivation to learn stemmed from their own purpose and personal desire for understanding science concepts in order to apply the information (Guthrie, 2004).

This research aligns with the first principle of study technology, which involves the student's purpose for learning. Study Technology teaches the student to consider these key points prior to studying:

- What is my reason for studying this subject?
- How can I apply this material?
- Do I feel I already know this material, or is there something here I can learn? (*Basic Study Manual*, 1992)

The act of clarifying of these points by the student for himself, prior to undertaking the reading task, delineates his purpose and removes a possibly uninspected first obstacle to learning which is: *feeling that one knows it all already and has nothing to learn from the text* (*Basic Study Manual*, 1992).

Whole populations of students can be lost for want of a personal purpose for learning a subject. Students whose backgrounds or experiences are such that they find school topics irrelevant simply never take the first step towards applying themselves to study. Perhaps they see no reason to study, since they cannot envision a future in which they would need to apply the academic concepts being presented to them (Erickson, 1987).

The success of the East Los Angeles math teacher, Jaime Escalante, the subject of a book and the subsequent movie "Stand and Deliver," was largely due of Escalante's unique ability to inspire students with real examples of the uses of mathematics in careers. This award-winning educator continually provided a reason for studying, an avenue for students to achieve, and maintained high expectations for students who were normally at risk of dropping out of high school (Mathews,1989). These high expectations and the students' own desire motivated students toward high achievement.

Only with a personal purpose and the above points clarified can the student learn and apply the three barriers to study-three key strategies that the student applies during the reading process.

The Three Barriers to Study

Barrier 1: Absence of Mass

According to the principles of the Study Technology, the first barrier to study is "absence of mass." The "mass" of a subject refers to the concrete elements of a subject as distinct from mere information about the subject (*Basic Study Manual*, 1992).

For example, if one were studying how to dissect a frog, the mass would be the actual frog and dissection instruments, as opposed to information about frogs or information about dissection procedures. Hence, the mass refers to the tactile elements of the subject-those things that can be felt, handled, or directly observed.

If one were studying about *The Declaration of Independence*, a copy of it would supply the reality of the document and the mass. Similarly, if one were learning to use a computer or a program, it would be very difficult to do so without being able to strike keys and do the actions described in the manual. The absence of a computer or the software with which to work constitutes a condition of lack of mass.

Reading a text on a subject or listening to a lecture on a subject without having the actual "mass" of the subject makes learning much more difficult. The solution to the problem is to supply the mass. Mathematics teachers have long used "manipulatives," such as pennies or plastic rods, to supply the mass for intangible numerical concepts. ESL teachers use the term "realia" to mean supplying the real everyday objects to enhance comprehension in language learning.

In the case of the biology instruction above, the teacher could supply the student with an actual frog and dissection instruments that the student can observe while he reads the text. If this is not possible, then a video or even a facsimile such as a photograph of the frog or the equipment is an improvement over total absence of the physical. In this way, the student connects the theoretical with the concrete. Those familiar with Gardner's "Theory of Multiple Intelligences" (Gardner, 1983), may think this solution relevant mainly to "tactile learners," however, that is not the point here. Study Technology proposes that all learners benefit from having the mass of the subject they are studying.

Barrier 2: Too Steep a Gradient

The Study Technology defines a gradient as "a gradual approach to something taken step by step, level by level, each step or level being, of itself, easily attainable-so that finally, quite complicated and difficult activities can be achieved with relative ease. The term gradient also applies to each of the steps taken in such an approach." The second barrier to study is too steep a gradient (B*asic Study Manual*, 1992).

Though not the same as pacing-simply adjusting the rate at which the material to be learned is presented-using the correct gradient requires the teacher, or the student (if learning independently), to monitor comprehension and handle confusions by stopping and returning to where the student last felt confident in his mastery of the subject.

Additionally, though teaching with a gradient is not the same as "scaffolding," an approach in which the teacher's support for learning a task is very gradually removed so the learner can perform independently, scaffolding is a good example of instruction that provides a step-by-step gradient for the learner.

Basically, the Study Technology principle of "too steep a gradient" teaches the student that making too large a jump while learning may cause him to feel confused. According to Study Technology principles the student may think that he doesn't understand anything, or doesn't understand the task he is working on when, in fact, his difficulties stem from not learning an earlier principle. The student is taught that the remedy is to backtrack and find what he felt he understood well just before he got confused. He typically will find that there is something in this area-the last area that he felt he understood -that he, in fact, did not really understand. Forward progress is made when this is cleared up (*Basic Study Manual*, 1992).

The barrier of "too steep a gradient" is more obvious when one observes someone doing an activity, such as learning to ride a bike without training wheels for the first time, but it is equally observable in other subjects as well (*Basic Study Manual*, 1992).

A common example of this is attempting to learn computer programs through a study of the manual alone. One follows along conscientiously only to find oneself seriously adrift and confused. Frequently this is because the manual, itself, skips steps or does not adequately explain the procedure. The result for the individual is the same--one feels suddenly lost and unable to learn. Where the fault lies in what reading professionals would term "inconsiderate text," it is not possible to go back to where one was last doing well and find the area of confusion. It may be necessary to locate other texts or resources to help fill in the gap. Thus it is that many people learn basic computer skills through trial and error and with help from friends rather than from the manual itself.

Barrier 3: The Misunderstood Word

According to Study Technology, the third, and most important, barrier to study is "the misunderstood word." Study Technology defines a misunderstood word as "a word that is not understood or wrongly understood." The Study Technology method proposes that the confusion or inability to grasp or learn comes AFTER a word that the person did not have defined or understood (Basic Study Manual, 1992).

The example given on the first page of the *Basic Study Manual* follows:

> "*It was found that when the crepuscule arrived the children were quieter and when it was not present, they were much livelier.* You see what happens. You think you don't understand the whole idea, but the inability to understand came entirely from the one word you could not define, crepuscule, which means twilight or darkness."

Here is another example from a popular American poem, "When the Frost is on the Punkin," by James Whitcomb Riley. The first line that might conjure up some odd images for urban sixth graders:

"When the frost is on the punkin and the fodder's in the shock…"

Might the word *fodder* mean - father? Does the word shock -refer to a sudden impact or a medical condition? Students could definitely misunderstand that fodder is feed for livestock consisting of chopped stalks and leaves of corn mixed with hay. The word *shock* here refers to sheaves of grain stacked upright to dry in a field.

The common misunderstanding of the Pledge of Allegiance of the United States has some very young students thinking that the nation is "one nation, *invisible*" rather than "one nation, indivisible."

A key point of the Study Technology is that it is the misunderstood word that establishes lack of aptitude in a subject. The misunderstood word precedes the student's inability to act or perform in a subject and can eventually cause the student to give up a subject altogether. Conversely, if the student's misunderstood words in a subject can be found and cleared up, resurgence in interest and ability in a subject will ensue (*Basic Study Manual*, 1992).

The application of Study Technology methods involve teaching the student to monitor his own comprehension so that words not understood can be identified and defined as an ongoing strategy.

Physiological Reactions and the Three Barriers to Study

Unique to the application of Study Technology is that each of the three barriers to study described above has corresponding mental and physical reactions (*Basic Study Manual*, 1992).

Most teachers have observed a look of blankness on the student's face who does not understand a particular word or terminology of a subject. The student who has been pushed past a comfortable gradient displays a type of frustration, confusion and ineptitude that all too many teachers have observed, both when instructing students in theoretical concepts as well as during activities requiring procedures (such as solving algebraic equations or carrying out science experiments). The veteran teacher also knows that giving a straight lecture with no models, visuals, or interaction between students is a recipe for disaster

as students quickly turn off because the mass or the real "stuff" of the topic being discussed is simply missing.

Instructors trained in the Study Technology methods routinely utilize such observable phenomena as clues to determining which barrier the student is manifesting. Similarly, students trained in these skills have the tool of a learning strategy that will help them in all subjects.

The Method

The comprehension strategies of the Study Technology can be applied individually when reading silently, cooperatively with pairs of students, or in a whole class setting by the teacher.

At the word level and sentence level of text, the Study Technology provides students with specific steps for monitoring their comprehension while reading independently. However, the method also suggests ways for students to do a type of comprehension analysis cooperatively. With a partner, students locate non-comprehended words and gain understanding through dictionary use, questioning one another and responding. Pairs work together to check each other's understanding and fluency. The read-aloud method of clearing up words provides an additional means for the teacher to maintain the role of observer/evaluator as students work together.

Students "twinning." Photo courtesy of Applied Scholastics, International.

There are a number of advantages to the cooperative learning model used in the Study Technology methodology. "Twinning," (as it is called in the Study Technology) or working in pairs, helps both students to see the importance of monitoring comprehension in an ongoing way. There have been some models of cooperative learning that pair students together in metacognitive tasks, such as in reciprocal teaching (Palincsar & Brown, 1984) in which students were explicitly taught strategies, practiced self-monitoring when in applying these strategies, and worked cooperatively asking and answering text-related questions. Study Technology methods address the step-by-step reading process and also use cooperative learning in peer tutoring and in comprehension checking of text.

Researchers have noted that the use of manipulatives promotes understanding in mathematics (Hartshorn & Boren, 1990). The recent trend to increase textual understanding

Student using a demonstration [demo] kit. Photo courtesy of Applied Scholastics International.

through graphic organizers (such as concept maps and diagrams) in content area reading is an effort to have students construct meaning for themselves and demonstrate what they have understood. The use of demonstration kits in the Study Technology provides a way to use manipulatives to check understanding

Students in Mexico making clay demonstrations. Photo courtesy of Applied Scholastics International.

by having the student manipulate paper clips, objects, etc. as symbolic representations of concepts.

The use of clay for students at all levels as a tool to represent concepts is an innovative method of permitting students to physically construct and label ideas. This

Additional Mexican students making clay demonstrations. Photo courtesy of Applied Scholastics International.

method of showing one's understanding provides an additional performance assessment for the teacher, as does the use of sketching and manipulatives suggested in the books.

The texts for teaching the Study Technology methods provide drills of a performance nature that require students to

Students using Study Technology in a community literacy program. Photo courtesy of Applied Scholastics, International.

apply what they have learned. Such drills align with performance-based objectives and assessment measures being designed by nationally by all states as a result of the emphasis on achieving educational standards.

The Study Technology program could dovetail with an existing curriculum or be implemented as a stand-alone program (such as in community literacy centers). Once the principles are taught, students can apply the method to any subject or content area.

There are intensive procedures utilizing this basic approach that can be implemented in special classes or tutorial settings in order to help those students who are seriously deficient in study skills and far behind in grade level skills. But such techniques are beyond the scope of this paper, which focuses on simply introducing an effective and straightforward learning strategy that can be easily taught and used by teachers and students to improve classroom learning.

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Notes

1. Applied Scholastics International is a non-profit, secular (non-religious) educational organization. The group publishes materials and delivers educational services that are based on the educational research and writings of author and humanitarian L. Ron Hubbard. The Applied Scholastics International Headquarters and teacher training facility is located near St. Louis in Spanish Lake, Missouri. (Source: Applied Scholastics International Web site: http://www.appliedscholastics.org)

2. L. Ron Hubbard was an author, educator, humanitarian, and founder of Dianetics and Scientology. His many interests and areas of research included the field of education. He taught Chamorro children in Guam, trained military personnel during the course of WW II, and thousands of students of Dianetics and Scientology. Source: L. Ron Hubbard, The Humanitarian: Education. (1986). Los Angeles, CA: Church of Scientology International. (pp. 70-89).

3. The definition of technology: Greek tekhnologia, systematic treatment of an art of craft: tekne, skill; + -logia, -logy. The American Heritage® Dictionary of the English Language, 4th ed. Boston: Houghton Mifflin, 2000. www.bartleby.com/61/. [Jan. 9, 2006].

Author Note

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and curriculum at the K-Adult levels. She has experience using the Study Technology in workplace training programs for adults.

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