# Instructional Models for Tutoring: A Review

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**Abstract.** This paper describes tutoring models and compares and contrasts the instructional strategies in those models that have been found effective by practitioners or researchers. The models reviewed include those of Literacy Volunteers, Laubach Literacy, Structured Tutoring, Programmed Tutoring, Peer-Mediated Instruction, and the Audio-Tutorial System. The review of these tutoring models reveals that there are different types of tutoring. Remedial versus first-time, mainline versus adjunct, and peer versus professional tutoring should be chosen on the basis of learner characteristics, setting, or learning task requirements. The tutoring strategies discussed are classified as organizational, delivery, and management strategies. The cost-effectiveness and adaptability of tutoring and conclusions concerning the further development of tutoring models are also discussed.

This paper describes, compares, and contrasts a variety of representative tutoring models that have been found to be effective by practitioners or researchers. Two important questions addressed herein are whether tutoring may require instructional strategies, and under what conditions tutoring should be chosen as an instructional mode. Commonalities and unique contributions of the tutoring models are identified to make it easier to integrate our current knowledge into optimal prescriptions for tutoring. It is hoped that this will both (a) provide the basis for further research and instructional theory development and (b) provide some further guidance for current practice.

Three questions, then, are of interest:

1. What is tutoring?
2. When should tutoring be used?
3. What strategies are unique to tutoring and not simply common to all good instruction?

Tutoring strategies were examined and classified as organizational, those dealing with the presentation components of the instruction; delivery, those dealing with materials, physical setting, or human contact; and management, those dealing with diagnosis, record keeping, prescriptions, and training of tutors. (Reigeluth, 1983).

## Types of Tutoring

Tutoring is a kind of individualized instructional delivery mode. For the purpose of this review, we have used a simple but broad definition: instruction with one-to-one human interaction. We emphasize "human" and "interaction" because, unlike individualized instruction through print or machine media, a person is always the primary delivery mode. But unlike a lecture delivered by a person, tutoring always allows for continual, frequent response and feedback. "One-to-one" indicates non-group instruction in that a tutor is able frequently and rapidly to modify the instruction as it takes place, and to account for infinite combinations of learner and task characteristics or other constraints.

Tutoring can be done either by an *expert* (often called professional tutoring) or by an *amateur* (usually referred to as peer tutoring). Peer tutoring usually refers to arrangements in which the tutor and tutee have the same status but may not necessarily be the same age ("cross-age tutoring"). Peer tutoring may also take place between a learner and someone other than another student. School tutoring programs described in the literature often have parents, teacher-aids, or other paraprofessionals, paid or non-paid, who act as tutors. In addition to their lack of training, all of these amateurs differ from professionals in that they usually are supervised by someone.

For those students who are unsuccessful in traditional group instruction, tutoring is often *remedial* in nature. Thus, it is used as a follow-up to some other type of instruction. Tutoring may also be used for first-time, or non-remedial, instruction. The nature of the skill or subject matter may require tutoring. Most instrumental music instruction is *first-time* tutorial instruction. Instruction in microsurgery techniques may also require one-to-one instruction.

Further variation in the use of tutoring is suggested by the degree to which tutoring is utilized in the total instructional process. Tutoring can be a totally *"stand-alone"* (or mainline) process, as is usually the case in such non-school programs as Literacy Volunteers or Laubach Literacy International, or in on-the-job situations. However, tutoring can also be used in conjunction with other modes of instruction (*adjunct* tutoring). Tutoring is used to supplement such individualized self-instructional methods as the Personalized System of Instruction (Keller, 1968) and the Audio-Tutorial Method (Postlethwait, Novak & Murray, 1972). Tutoring programs may be institutional (i.e., sponsored by an institution) or non-institutional. Most research has been based on tutoring programs that are a part of traditional school settings, and most of those programs deal with remedial instruction in reading and mathematics.

## Historical Background

A tutorial movement called the Bell-Lancaster system (sometimes referred to as the Monitorial or Madras System) gained popularity in England during the early 19th century (Thiagarajan, 1977). Andrew Bell, the superintendent of a school for orphans at Madras, India, devised a system using older children to

teach other children in order to provide better instruction and discipline for the child. Professional educator Joseph Lancaster adapted Bell's idea to devise a monitoring system driven by economic rather than educational factors (Ehly & Larsen, 1980) as a means to provide instruction for a growing student population in his school in England.

Lancaster's tutoring program was a complete instructional system. It included a systematically sequenced curriculum with procedures for tutors to follow, and it was inexpensive. Lancaster also developed a system of token economy using merit tickets (as reinforcement), which could be earned through both academic performance and behavior (Thiagarajan, 1977). The success of the system, however, depended upon precise, orderly management, which was not formerly possible with a single teacher and many students (Allen, 1976). Most recent tutoring models are based, at least in part, on the Bell-Lancaster system.

## Recent Research and Practice

### Tutoring Models (Practice)

The following is a brief description of some of the most prominent tutoring models (programs). It identifies the domain for which each was designed, including the kind of tutees, the kind of tutors, the skill area, the type of tutoring (e.g., first-time vs. remedial and adjunct vs. mainline), and the level of learning (remembering information vs. applying rules in new situations). Following this section is a description of the instructional strategies (organizational, delivery, and management) that are emphasized by each model. All of the characteristics of the models described below are compared in Table 1.

*Literacy Volunteers of America, Inc.* Literacy Volunteers of America (Colvin, 1980; Colvin & Root, 1981) is a national literacy tutoring program begun in Syracuse, New York. Its primary emphasis is on the tutoring of adults in reading and English as a second language through community-based, volunteer tutoring. Recently, however, Literacy Volunteers has had a program called the Teen Tutoring Program, in which high school students tutor younger students. Literacy Volunteers also sponsors tutoring in prisons.

*Laubach Literacy International.* Lauback Literacy International (Laubach, Kirk, &.Laubach, 1981) is an organization founded by Frank C. Laubach that also enlists volunteer tutors to organize and administer local community-based literacy programs for teaching reading and writing skills to adults: both native speakers of English and speakers of other languages (Literacy Trainer Handbook, Macero & Lane, 1976).

*Structured Tutoring.* Grant Von Harrison (1972, 1975) has developed an instructional model called Structured Tutoring. In this model, tutors work with learners in a one-to-one situation. Harrison's model has been used in elementary schools for intergrade peer tutoring and for parent and paraprofessional tutoring in both reading and mathematics, often for remedial purposes.

*Programmed Tutoring.* Douglas Ellson (1976) developed the Programmed Tutoring model in the 1960's at Indiana University. The lesson content in Programmed Tutoring is highly structured and designed to lead the learner in small steps, much like programmed instruction. The instructional materials and teaching strategies are prescribed in enough detail that nonprofessional adults or students can be taught to use them quickly. Ellson advocates the use of his tutoring program as an adjunct to academic classroom teaching rather than as a substitute for it (Ehly & Larsen, 1980). Programmed tutoring has been used in institutional and non-institutional settings primarily for remedial instruction in reading and mathematics.

*Peer-Mediated Instruction.* Peter Rosenbaum (1973) developed a peer tutoring model based on the instructional program processes of computer-assisted instruction. In the PMI system, students work in pairs with one student designated as the "teacher" and one designated as the "student." Peer-Mediated Instruction has been proven effective in teaching spelling at the elementary level, and in basic skills training with adults in American Telephone and Telegraph.

*Personalized System of Instruction (Keller Plan).* Fred Keller's (1968) Personalized System of Instruction (PSI) is an instructional management system in which students work on individualized materials at their own pace in a classroom setting. Advanced students, or proctors, provide one-to-one tutorial assistance to help students master the sequentially arranged materials. PSI originated at the college level, but has been used at all grade levels and most subject areas. It is also used in military and industrial training.

*Audio-Tutorial System.* The Audio-Tutorial System developed by Postlethwait, Novak, & Murray (1972) is an individually-paced, independent-study method using audio tapes. These tapes are tutorial conversations with the instructor. A live instructor is always available to give students needed tutorial assistance. Besides one-to-one instruction, the Audio-Tutorial System also utilizes large and small group instruction. The Audio-Tutorial system is used primarily in science education, but has been successfully applied in many other subject areas, at many age levels, and in both institutional and non-institutional settings.

> Tutoring can provide instruction that is cost effective, individualized, and interactive.

*Other Tutoring Models.* Many other models for tutoring have been developed and used on a more local scale, such as Bramley (1979), Bright (1972), Ebersole & Dewitt (1972), Grabowski (1976), Lippitt (1975), Melaragno (1972, 1976), Niedermeyer & Ellis (1972), Pope (1976), Rauch (1969), Thiagarajan (1976, 1977, 1978), U.S. Department of Health, Education, and Welfare, (1974a, 1974b), Verduin, Miller, & Greer (1977), and Wagner (1976). For the most part, each utilizes various components of the above described models.

### Research

Most of the "structured" or "programmed" tutoring models, such as those developed by Ellson, Harrison, and Rosenbaum, are supported by research. Other programs, such as the Literacy Volunteers of America and Laubach Literacy International programs, report

**Table 1.** *A comparison of tutoring models*

| | *LVA* | *Laubach* | *Structured Tutoring* | *Programmed Tutoring* | *PMI* | *PSI* | *Audio-Tutorial* |
|---|---|---|---|---|---|---|---|
| STUDENTS: | | | | | | | |
| School Age | X | X | X | X | X | X | X |
| College | | | | | | X | X |
| Adult | X | X | | X | X | X | X |
| SETTING: | | | | | | | |
| Informal | X | X | | X | | | X |
| School | X | X | X | X | X | X | X |
| College | | | | | | X | X |
| Distance | | | | | | | X |
| Military | | | | | | X | X |
| Bus/Ind. | | | | | X | X | X |
| TUTOR: | | | | | | | |
| Peer | X | X | X | X | X | X | |
| Professional | | | | | | | X |
| SKILL AREA: | Reading ESL* | Reading ESL | Reading Math | Reading Math | Spelling Basic Skills | All | Science Most Others |
| PURPOSE: | | | | | | | |
| Remedial | X | X | X | X | X | | |
| First-time | X(ESL) | X(ESL) | X | X | X | X | X |
| Adjunction | | | X | X | | X | X |
| Mainline | X | X | X | X | X | | |
| LEVEL OF LEARNING: | | | | | | | |
| Recall | X | X | X | X | X | X | X |
| Application | X | X | X | X | X | X | X |
| TYPE OF STRATEGIES EMPHASIZED: | | | | | | | |
| Organizational | | | | | | | |
| Generality | X | X | | | | | |
| Example | X | X | | | | | |
| Practice | X | X | X | X | | | |
| Feedback | X | X | X | X | X | X | X |
| Sequence | X | X | X | X | X | X | X |
| Delivery | | | | | | | |
| Structured Materials | X | X | X | X | X | X | X |
| Management | | | | | | | |
| Records | X | X | X | X | X | X | X |
| Training | X | X | X | X | X | | |
| Rapport | X | | X | X | | | |

*English as a second language

anecdotal accounts of success.

Cohen, Kulik, and Kulik (1982) analyzed 65 studies dealing with elementary and secondary school peer-tutoring programs, and concluded that achievement was higher and that student attitudes toward instruction were more positive with peer tutoring than with conventional classroom instruction, but that the effect of tutoring on student self-concept was insignificant. Most of the studies also found higher achievement and positive attitude toward the subject matter for students who served as tutors. Cohen et al. (1982) found greater student achievement in studies in which (a) tutoring was a substitute for, rather than a supplement to, conventional classroom instruction, (b) tutors received training, (c) there was cross-age rather than same-age tutoring, (d) the tutoring was structured, (e) the tutoring was of short duration, and (f) the subject was mathematics.

In summary, tutoring practice and research indicate that tutoring is effective for a variety of settings, skill types, learning levels, and types of tutors and tutees. Tutoring may also be effective with other instructional formats (e.g., group instruction and self-instruction).

## An Analysis of Strategy Components

Despite much diversity in the use of tutoring, many commonalities exist among effective tutoring models described in the literature. An examination of these models and of the research and practice in tutoring reveals that effective tutoring has the following common characteristics (or strategies): (a) a *systematic arrangement* of the subject matter to be taught, (b) specific, predetermined *instructional* strategies for the use of stimulus material, practice, and corrective feedback, (c) explicit *management procedures*, which include instructional prescription and records of student progress, (d) specific *materials* that facilitate the instruction and management processes, and (e) the *training* of tutors in instructional and management strategies.

Tutoring strategies described in the literature can be classified according to three main kinds of instructional strategies: organizational strategies, management strategies, and delivery strategies (Reigeluth & Merrill, 1979). *Organizational* strategies refer both to micro strategies, which are strategies for teaching a single idea (such as explanation, example, practice, and feedback), and to macro strategies, which are strategies that relate to many ideas (such as selecting, sequencing, synthesizing, and systematically reviewing those ideas). *Delivery* strategies are those strategies for bringing the instruction to the learner and through which interaction with the learner can take place. They are primarily concerned with medium of instruction. *Management* strategies are those strategies for deciding which organizational or delivery strategies to use and when to use them in order to maximize learning.

### Organizational Strategies

Most of the tutoring programs described in the literature deal with basic skills instruction in reading and mathematics and emphasize primarily *practice* and *feedback* strategies, which are micro-level organizational strategies. Ellson's (1976) micro-level organizational strategies for his programmed tutoring model are based on Thorndike's stimulus-response-feedback model. At the elemental level, tutoring consists of *small units* of teaching material that correspond to frames of programmed learning, according to Ellson. Ellson describes precise *prompting* sequences for practice and feedback, which Thiagarajan (1978) has used as a basis for specific instructions to tutors, called "tutoraids." Rosenbaum's (1973) peer tutoring model emphasizes practice and feedback strategies at the micro level, also. His "correction algorithm," or corrective feedback process, is very similar to Ellson's prompting sequence. Harrison (1975) indicates that tutoring should provide corrective and confirmatory feedback as well as appropriate *examples, practice,* and *systematic review*. Literacy Volunteers and Laubach Literacy International have less precisely described practice and feedback procedures, but do emphasize *generality* (or explanation), example, practice, feedback, and review. Literacy Volunteers does describe several practice and feedback strategies in flowchart form in its English as a second language program (Colvin, 1980.)

At the macro level, most tutoring models emphasize the need for a predetermined *hierarchical sequence*. Harrison, Ellson, and Rosenbaum describe overall hierarchical sequences of subject matter, each of which is subdivided into smaller units or items. The order of items in this kind of sequence can be changed, based on the student's successes or failures throughout the lesson. Michael Gerber and James M. Kauffman (1981) cite studies indicating that the critical factors in tutoring are the organization and structure of the material to be tutored and the responses expected from the tutees. The material should be arranged in a *programmed format* or some other clear hierarchical and sequential arrangement, and the responses required from the tutee should be simple and unambiguous.

### Management Strategies

Most tutoring models contain a management component that specifies strategies for management of both the tutor and the learner. In the case of *peer tutors*, there is often a supervising instructor who manages the tutor's activities. *Learner* management strategies include diagnosis, individualized prescriptions, record keeping, and reward systems. Rosenbaum describes the use of student activity lists that guide the student throughout the instruction and direct the tutor to provide tutoring assistance based on the tutee's progress. Ellson states in his "programmed tutoring," that it is the tutor's activity that is "programmed," or described in detail by specific instructions or programs. Ellson, Rosenbaum,, Harrison, Literacy Volunteers, and Laubach Literacy International emphasize diagnosis for *placement* and *record keeping* of student progress toward mastery. Literacy Volunteers also emphasizes the *individualization* of the tutoring process based on the learner's interests and motivational needs. Gerber and Kauffman (1981) cite research supporting the positive effects of *rewarding* not only the appropriate

> Criteria are needed to determine when to use tutoring and which tutoring model to use.

performance of tutees, but also the appropriate tutoring behavior.

Tutor management strategies cited in the literature include the selection, training, and monitoring of tutors. Regarding selection, Rosenbaum advocates a *random* pairing and *rotation* of peer tutors and tutees to avoid continuation of any possible bad pairing, but he does not offer any selection criteria. Cloward (1976) conducted research that indicates that those who would *benefit from teaching* others should be chosen as tutors. Cloward's data indicates that tutors stand to benefit from the tutoring process, and the high-ability student who is a low achiever in school may benefit the most. Gerber and Kauffman (1981) cite research supporting the use of peers. They cite several studies that indicate that peer tutoring may be at least as effective as teacher-led instruction, and that tutoring as a supplement to teaching may be more effective than teaching alone. Feldman, Devin-Sheehan, and Allen (1976), cite anecdotal evidence and research that supports the idea that students with behavior problems or low achievement benefit from being tutors. They find no data to support same-sex pairing, but they cite one study that found that male tutors and tutees benefit more from tutoring than females. They also cite some evidence that the relationship between tutor and tutee may be more pleasant if the age difference is small.

Most studies indicate that tutor *training* is important to effective tutoring, but Feldman et al. (1976) state that research indicates no one particular method of training is superior to any other. Fred C. Niedermeyer (1976) states that tutors should be trained in the use of good instructional techniques: using rapport, verbal praise, unambiguous directions, and corrective feedback. He states that tutors should be trained in these techniques through *direct practice* and *role playing*. Rosenbaum suggests that training for peer tutors should be flexible and at the discretion of the supervising instructor, using either an expository or an experiential method. The most intensive training programs are those used by Literacy Volunteers and Laubach, which consist of training workshops lasting several days.

Ehly and Larsen (1980) suggest tutor *monitoring*, as do most other tutoring models. Monitoring usually consists of the supervising teacher observing peer tutors to see that they use good rapport with the tutee, follow prescribed tutoring techniques, and keep records properly. Tutor training and monitoring is intended for peer tutors, or nonprofessional volunteers. However, several models also recommend that teachers supervising peer tutors receive orientation and a supervisor's manual.

**Peer tutoring has a more positive effect on student achievement levels and attitudes than conventional classroom instruction.**

**Delivery Strategies**

All tutoring models use *one-to-one personal* contact as the mode of delivery. However, most models also use structured materials, designed to be used by the tutor with only moderate training. Rosenbaum suggests using existing materials with an implied logical sequence, whereas Literacy Volunteers offers suggestions to the tutor for self-prepared materials. Harrison (1975) suggests that the materials provide appropriate examples, practice, and review. Thiagarajan (1978) offers the most specific description of designer-made tutoring materials. His materials, called "Tutoraids", are self-contained packages of stimulus materials for the learner and performance aids for the tutor. Each package deals with a single, prespecified, instructional objective. Most tutoring models include learner diagnostic materials, stimulus materials, tutoring instructions for tutors, and record keeping forms.

**Cost-effectiveness and Adaptability**

Rosenbaum developed his Peer-Mediated Instruction as a cost-effective simulation of computer-assisted instruction. He reports a study in which 74 percent of tutored students mastered an instructional sequence in less than half the time allowed for conventional teaching (Rosenbaum, 1973). Ellson (1976) cites the cost savings that can be realized by using unpaid volunteers or peers rather than professional teachers. Ellson, using effectiveness improvement, time reduction, and salary difference as factors, concludes that tutoring can be estimated to be almost 10 times as cost-effective as classroom teaching (for basic skills instruction).

Rosenbaum (1973) states that his Peer-Mediated Instruction can extend over all subject matters and ages, with the exception of complex industrial skills, or subject matter that cannot be operationally defined with enough specificity for peer tutors, such as foreign language instruction. The latter require the use of professional instructors for tutoring.

## Summary and Conclusion

This review of tutoring reveals that there are different types of tutoring (remedial versus first-time, and mainline versus adjunct) and different types of tutors (peer and professional). These differences, as well as differences in target population, setting, skill area, and level of learning, suggest that different models are needed for different types of tutoring. Criteria are needed, therefore, to determine not only when to use tutoring, but when to use which tutoring model. To the extent that some (many) strategies are likely to be beneficial for *all* tutoring situations, it may be more useful to think in terms of different *variations* on a basic model rather than completely different models.

The review of tutoring models determined that there are several management strategies unique to tutoring, such as the selection, training, and monitoring of peer tutors, and the optimal physical setting. Some organizational strategies (which refer to the micro-level arrangement of the elements of the actual instruction) unique to tutoring, were also found: Ellson's "prompting sequences" and Rosenbaum's "correction algorithm" differ from what is normally thought of as programmed instruction because they must be created and modified based on the learner's response at the time of instruction. A closer examination of the presentation process is needed to determine whether the sequence of generalities, examples, practice, and feedback differs from other modes of instruction. Preliminary investigation does suggest, however, that during the practice phase of instruction, strategies such as cueing, coaching,

prompting, and questioning as used by Ellson and Rosenbaum may be unique to tutoring. The "corrective feedback" immediately follows short learner responses and is instantaneously modified. Furthermore, rapport between tutor and learner is a very well documented effective strategy that does not fit conveniently into one of the three categories of strategies we used, but is referred to in almost all of the models examined.

Surprisingly, the authors found little mention in the literature of the criteria to be used for choosing tutoring as an instructional mode. Rosenbaum does state that Peer-Mediated Instruction was devised in order to deliver the same instruction as computer-assisted instruction with virtually no cost. Historically (as in the Bell-Lancaster systems), peer tutoring has been offered as a low-cost alternative to teacher-delivered instruction. Tutoring has also been used traditionally for remedial instruction for students who have been previously unsuccessful in group classroom instruction. Perhaps criteria for choosing tutoring can also be derived from the characteristics of the learning task (e.g., Is human interaction required?), the physical setting (e.g., Is the student population widely dispersed?), the number of learners, student learning styles, and the availability and training of peer and professional tutors.

In order to design optimal tutoring models, those strategies known to be effective must be integrated into sets of prescriptions that include organizational strategies, delivery strategies, and management strategies. Factors such as cost-effectiveness, adaptability, and feasibility should also be considered in creating optimal models. Where strategies are lacking, the models will need to be extended to ensure comprehensiveness and breadth of application. Many of the tutoring models described in the literature include management strategies such as record-keeping and training of tutors, but there is less mention of what organizational strategies should be used for tutoring. It is important to know whether or not there are presentation and sequencing strategies unique to the tutoring mode.

In light of Rosenbaum's (1973) research, it may also be important to know in what ways (besides cost-effectiveness) tutoring and computer-assisted instruction are related. Can they be interchanged? Is either more suitable for a particular kind of learning skill or student? Perhaps there may be some benefit in the simultaneous use of tutoring and computer-assisted instruction.

**The tutoring models should be chosen on the basis of learner characteristics, settings, and learning task requirements.**

It is apparent that tutoring may be capable of providing many of the requirements for effective, efficient instruction: cost-effectiveness, individualization, active involvement of the learner, immediate corrective feedback, practice, and rapport between learner and instructor.

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