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AUTHOR Bialek, Hilton M.; And Others
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ABSTRACT

The Human Resources Research Organization (HumRRO) peer instruction model is presented, providing information for teachers on how to design and implement such a teaching system within Adult Basic Education (ABE) programs. The model presented requires that students meet specific performance criteria before they teach others, and that formats or modules be developed to enable students to understand what they must learn. Chapters include: an Introduction; What Is Peer Instruction?, discussing teaching methods; Why Use Peer Instruction?, discussing its special advantages for educationally disadvantaged students; When to Use Peer Instruction, discussing five minimum conditions which must exist before peer instruction is attempted; Designing a Peer Instruction System, presenting four steps, which include conditions, finding curriculum sources, writing modules, testing and revising modules; Evaluating the Peer Instruction Model, presenting an evaluation form; Putting the Model Into Operation, examining the setting, preparation of the students, priming the teacher/learning chain; Managing the Peer Instruction System, discussing the teacher's role; and, Checklist, presenting an outlined review of key points. An example of teaching experience involving ABE students, peer instruction, and learning how to write checks supplements the text. (LH)

PEER INSTRUCTION

IMPLEMENTATION MANUAL

Hilton M. Bialek
Laurie A. Mandel
Peter Nabokov

Human Resources Research Organization (HumRRO)
Western Division
27857 Berwick Drive
Carmel, California 93921

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INTRODUCTION

This manual is a guide to the HumRRO peer instruction system. It is designed for people interested in putting the HumRRO model into operation. Since peer instruction is not a magic formula which is plugged in and ready to go, the mental attitude of the personnel implementing peer instruction is highly important. This manual is designed to answer as many questions regarding the HumRRO peer instruction system and its application as possible. However, there are always local variations in terms of students-to-learn and subject-matter-to-be-taught. Each educational setting, each group of students, each administrative climate, each physical setting and each schedule of classes will present special, unforeseeable problems and frustrations which must and can be overcome. Their solution will require a common-sense, flexible, problem-solving approach if peer instruction is to be successfully adapted to that particular situation. Hopefully this manual reflects this approach.

WHAT IS PEER INSTRUCTION?

Sometimes known as "Each One/Teach One", peer instruction means students teaching each other. It can be viewed as a growing instructional chain with each new student becoming a new link.

Someone "primes" the teaching and learning chain by teaching the first student to learn a skill. This skill has already been broken down into its performance objectives, so both teacher and student know precisely what must be learned. When that first student feels he knows the task, he does it. If he does it successfully, correctly meeting all the criteria of its performance objectives, the first student is ready to teach a second student. The chain now has two links, and the first student is now a peer instructor.

As the chain grows the teaching is through oral explanation and cooperative "doing". (The work between peer instructor and student is private, but it generally opens with the peer instructor once again demonstrating the correct performance of the task while his student merely observes. After this "modeling" phase, the student begins to apply himself to the task.)

Peer teaching requires that students help each other instead of compete against each other. Now the students, rather than the teacher in front of the class, are responsible for the business of learning. In essence, peer instruction turns the job of learning and teaching over to students.

Sometimes a classroom full of such teaching chains, where many tasks are being taught by peer instructors to students, appears a little chaotic. But reliance on the ability of students to

"show and tell" each other, and the quality control device of strictly observed criteria, are actually creating a focused learning situation.

The Human Resources Research Organization (HumRRO) peer instruction model embodies two observations commonly made by teachers: (1) people learn best when they can practice what they have just learned - having to demonstrate and teach is an excellent way of providng this practice; (2) "expectancy to teach" makes the learner pay closer attention and take greater responsibility in the learning situation.

The HumRRO model, however, is different from informal "peer tutoring" where teachers assign students to help each other during study periods. In the HumRRO model, the student must meet the performance criteria before he is assigned to teach someone else. This standardized "check out" procedure insures that each student has learned the task and is qualified to teach. During this "check out", the student must perform the entire task correctly, as determined by the carefully prepared performance criteria. These criteria make sure the quality of learning does not deteriorate as the material is transmitted from student to student.

The HumRRO model has other special features. It requires that the information to be passed along the students' learning chain be broken down into a format that helps students clearly understand what they must learn. The mainstay of the HumRRO model is the "module". Modules are generally single-session teaching units, commonly they are components of lengthier instructional material.

In the HumRRO model each student receives the undivided attention of his peer instructor. This one-to-one instruction lets the student receive immediate, precise feedback about how well he is learning while he is in the act of learning.

WHY USE PEER INSTRUCTION?

Peer instruction has special advantages for educationally disadvantaged students with a history of discouraging school experiences. These students often approach school and teachers with suspicion and fear. They feel tremendously insecure about their ability to learn, and the written word aften intimidates them. As a result of these fears and inabilities, educationally disadvantaged students typically have difficulty working with self-instructional workbooks where learning steps are fixed. Their liabilities in literacy and self-image and motivation require more personalized attention, and immediate, personal acknowledgment of even the smallest achievements.

The one-to-one aspect of peer instruction, and its fundamental faith in the power and effectiveness of oral communication between the students themselves, would seem to make this model especially useful to educationally disadvantaged students. Taking on the responsibility of teaching enhances self-image and strengthens intra-student cooperation; students generally "feel good" about the peer teaching experience. Receiving instruction from a peer who has just mastered a new skill gives students confidence that they, too, can perform and teach successfully.

In the HumRRO model the subject matter is broken down into instructional units which are small enough to insure that most students can successfully complete them within a single class period. As the teaching role changes from passive recipient to responsible transmitter, there are often changes in student attitude toward the subject matter and themselves.

We have noticed the sense of pride and dedication which comes over students when it is their turn to teach.

Another advantage of the system over teacher-centered classrooms is that by avoiding the fixed-pace, one-shot presentation of subject matter, instruction is always available to the student who by necessity cannot attend classes on a daily basis. It flourishes on flexible scheduling, where a student who is absent one day can simply re-enter the system the next and pair up with a peer who is ready to fulfill his teaching role.

WHEN TO USE PEER INSTRUCTION

Peer instruction need not be considered a total instructional system; it can occur within a variety of educational settings and alongside other teaching techniques. It should only be employed, however, for that particular inventory of measurable, observable skills whose acquisition would truly be facilitated by students teaching each other. HumRRO-conducted research and development projects in military training settings, low-income minority communities and adult schools, have shown that performance-based "hands-on" skills are especially suited for the HumRRO model. We are still exploring the range of cognitive areas potentially adaptable to peer instruction. Based on our research to date, we have found that the following minimum conditions must exist before peer instruction is attempted.

Condition 1: Sponsoring agency or institution must commit sufficient staff to (a) prepare support material, and (b) manage the system in operation.

The responsibility of writing materials and managing the system could be handled by one person or several, depending upon the local situation. In some school systems there is a separate job description for a "curriculum developer" or "education coordinator", a person who does not normally instruct but who supports teachers in a technical capacity. This specialist is often the best choice to convert subject matter into a peer instruction format. But regardless of who prepares the material, someone still must be available to supervise the model in operation.

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The following right-hand pages chronicle the actual experience of an adult school teacher who used peer instruction to teach "survival skills" (functional literacy) to Basic Education students. This case study is to illustrate the manual's major points and is keyed into the text on the left-hand page.

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The principal of an adult school in southern California wanted to try the HumRRO peer instruction model in his Basic Education classes. He selected an ABE teacher with experience in writing curriculum and an interest in using peer instruction to prepare the support material and manage the system in operation. The principal asked the teacher to devote about one-third of her working time to developing a peer instruction system.

Condition 2: Minimum of eight (8) students who want or need to learn the exact same skill.

a. Minimum of Eight (8) Students

Designing and implementing a peer instruction system requires an initial investment of time and energy. Content must be converted into modular form, teachers must be introduced to their new roles as class managers, and an appropriate classroom setting must be arranged. To warrant this preparatory investment a minimum of eight students should be available to participate in each teaching/learning chain. (With fewer than eight students, small group instruction would probably be more efficient.)

b. Want or Need to Learn the Exact Same Skill

Peer instruction is based on the notion that all students in the learning chain are working toward an identical goal, whether by choice or requirement. All students must, therefore, pass an identical set of performance criteria standards for each information unit.

Condition 3: All students must be able to communicate with each other.

The peer teaching concept was in part created for students who have difficulty reading written instructions and working in self-instructional workbooks. Most of the learning occurs through a combination of oral explanation and actual performance. Whereas many "hands-on" or mechanical tasks require a maximum of "show" and a minimum of "tell", for more cognitive skills, peer instructors must communicate explanations and corrections to their students. Language barriers would make that almost impossible.

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First, the teacher presented her students with a list of "survival skills" and asked them to check the ones they were most interested ~~in~~ learning. The survey results showed that approximately 15 students (out of a class of 20) wanted to learn how to use a checking account and an equivalent number wanted to learn how to complete the short form income tax return.

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With the exception of two students (one with a hearing problem and the other who was not a native English speaker), everyone in the Basic Education class was able to communicate with each other.

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Condition 4: Skill must be commensurate with student ability and motivation.

Peer instruction works best for content areas that do not require frequent teacher monitoring or student remediation. Students should be "ready" for the skill both in terms of motivation and possession of the proper entry-level skills. Materials beyond the students' reach, and learning goals not shared by the students are more suitable for teacher-centered techniques than for peer instruction.

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Condition 5: There must be only one way to correctly perform the desired skill (if it involves a process) or only one way to complete the finished task (if it involves a product).

Skills which can be correctly performed in a variety of different ways are not suited for peer instruction. To teach these skills, peer instructors would need to learn all the variant techniques even though their given student would only need to demonstrate mastery of one. This places an unreasonable burden on the peer instructor. Accordingly, skills which call for student decision-making and involve personalized situations are not suited for peer instruction because they do not contain a single correct performance standard. Acceptable skills for peer instruction must have only one recognizable set of mastery criteria.

If one of these five conditions cannot be met, the likelihood that HumRRO's peer system will prove cost-effective is slight and other instructional approaches should be considered.

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Based on informal appraisal of her students but without any form of pre-testing, the teacher assumed that the students were "ready" in terms of interest and ability to learn the skills they had chosen.

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Since tax time was rapidly approaching, the teacher first applied peer instruction to help students complete their tax returns. But upon review of IRS "how-to" booklets, the teacher realized that this skill did not lend itself to peer instruction. Tax returns are correctly completed in a variety of different ways, depending upon an individual's filing status. To make peer teaching possible, students would need to learn the correct way to complete the form for every single filing category, even though in real life they would only need to know the one appropriate method for their own situation. Students would have to acquire and transmit a great deal of information which they themselves would not be required to know or use. Thus, peer instruction is an inappropriate method for teaching this particular skill.

DESIGNING A PEER INSTRUCTION SYSTEM

Step 1: Conditions for Peer Instruction

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Before attempting to convert curriculum into peer instruction modules, teachers should check that the minimum conditions outlined in the previous section do exist.

Step 2: Finding Curriculum Sources

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Once content has been chosen, it must be broken down into instructional units. For this the teacher needs a source for the content. This source can either be the teacher, an expert in the field, or available instructional material such as a textbook. Existing curriculum which has already been prepared in sequenced-task terms and spelled out in performance criteria often requires the least work. It can easily be converted into peer instruction modules. Sometimes a combined approach works best: write a first draft using the text and then revise it with an expert's help.

Step 3: Writing Modules

The teacher must break down the subject matter in order to have a "script" or instructional plan. The result of this process is small instructional units called "modules". They spell out what the teacher wants his students to be able to do at the completion of instruction. These modules are usually divided into two parts: (1) Criteria, or the statements on how the properly completed task must look and/or function, and (2) Steps, or teaching tips, which are helpful reminders to peer-instructors of important points to emphasize when they are

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After reviewing all the minimum conditions for peer instruction and rejecting income tax forms, the teacher began preparing peer instruction material on using a checking account.

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The teacher used three information sources: (1) her own first-hand knowledge of banking procedures; (2) existing programmed material, and (3) the expertise of a local bank manager.

For the initial module drafts, the teacher relied almost exclusively on her own knowledge, with some help from the programmed material. She revised the module drafts with the assistance of the banking "expert".

teaching the task.

It is important to note at this point, however, that this written material is primarily the teacher's instructional plan or blueprint. While it is essential for the teacher to extract and write down precise criteria for each task (statements which when delineated become the "check-test" for the task), it is expected that students, for the most part, will communicate these criteria to each other orally. THE WRITTEN MODULE IS DESIGNED TO SUPPORT ORAL TEACHING, NOT SUBSTITUTE FOR IT. Too much dependence on the written module and expectation that peer instructors will use it as their script will disrupt the all-important peer interaction and slow up natural communication between students. Similarly, the Steps portion of each module can serve as "back up" support for the peer instructor's oral teaching but does not substitute for it. How much written material needs to be in the students' hands will be determined by the "trial runs", when the modules and their criteria are being tested for the first time.

To summarize, peer instruction modules have three functions: (1) They provide the teacher with an overall instructional plan; they are his course blueprint. (2) They support the actual "show and tell" student teaching, reminding students (when necessary) of their precise task goals and assisting peer instructors (when necessary) to emphasize certain critical manuvers in the task. (3) Their criteria are the "check-out tests" administered by the teacher when both the student and peer instructor feel confident the student has learned the task.

Regardless whether the content comes from a teacher's personal expertise or from published texts, the job of breaking the material into sequenced tasks and deriving tight performance criteria is the same. The following outline should serve as a general guide for converting raw material into peer instruction modules. Teachers will find, however, that module preparation always requires ingenuity adapted to the particular situation.

A. Breaking Material Down Into Modules

The selected subject matter must be analyzed so that the sub-tasks which comprise it are identified and sequenced. Through trial and error, a logical breakdown and sequencing generally emerges. For example, some tasks are divided into two, three or more sub-tasks. Each of them might constitute a single peer instruction module. Other tasks, such as "how to change a car tire", obviously can be contained within one peer instruction module and will occupy only one instructional period of time. Experienced teachers and curriculum writers usually have developed a "feel" for sub-tasks which have their own beginning/middle/end, and they can generally estimate the average time it would take for a student to complete a module. If that time is not too extended, so that the student still gets the needed feedback and does not wait too long for the supportive reward of proving he can do the task, then it is probably a reasonable length for the module. For complex subject matter, such as basic reading, math, first aid, clerical skills, clearly the materials calls for reduction into sequences of sub-tasks. In sum, to qualify as a single module, each unit should have some self-contained completeness so that students frequently experience a sense of accomplishment upon mastering it.

Once the content has been dissected into its sub-tasks, it must be determined whether these smaller units are interdependent or discrete. Can they be learned or do they build upon each other in definite sequence? Based on the answer to that question, the modules are either written in order or the teacher begins with the easiest and simplest first.

It became clear to the teacher that using a checking account was composed of four separate but interrelated sub-tasks: (1) how to write checks, (2) how to fill out a check record, (3) how to fill out a deposit slip, and (4) how to reconcile a monthly bank statement. Since these sub-tasks are built upon each other, the teacher began to write them up in the order they would be learned by the students - beginning with the check-writing module first.

B. Stating the Task

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At the top of every module should be a simple statement of the task to be learned. This statement spells out clearly and precisely what the student is able to do when he has successfully completed the task. Again, this written clarification is for the teacher's benefit; students will transmit it to each other by word-of-mouth.

C. Listing Special Materials and Equipment

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Following the task statement the materials required for the teaching and learning should be listed so that peer instructors can ready their students for the learning. Here, too, this will generally be told rather than read by the students.

D. Deriving Performance Criteria

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As stated, Criteria consist of statements on how the properly completed task must look and/or function - to the satisfaction of the teacher. They become the sole, essential standards against which the finished task is judged. That is, students must pass each and every criteria statement if they are to successfully complete the module and go on to teach it to someone else.

As the raw content material is being broken down into modular form, the module writer must constantly be on the lookout for the module's performance criteria, all the features which define the completeness and correctness of the module's finished task. In most cases the teacher will be the ultimate authority on what constitutes

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To describe the task of the check-writing module the teacher wrote: "The student must correctly and neatly write a check."

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No special equipment would be needed for the check-writing module. The students would need only a pen, in addition to the written module, to learn the task.

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The teacher combined her own requirements with suggestions from the bank "expert" to determine performance criteria. The bank manager spelled out the minimum standards required by banks before a check can be processed -- i.e. no erasures or changes, same amount listed in words and numbers, readable, etc. The teacher added the requirement that all the words be spelled correctly. It was important for the teacher to write down <u>all</u> these criteria because they would make-up the performance test against which the students' work would be measured. Since the check-writing module requires students to produce a finished product - in this case, a check - the criteria simply cover what the correctly completed check must look like.

the performance standards for each module. To help derive these observable, measurable criteria, she must continually ask: "How would I know that this task has been completely and properly done?". Well-stated criteria checklists generally contain the following information:

1. Who - (the student)
2. Behavior - (actually "doing" the task, the verbs describing task's activity: "writes", "names", "identifies", "connects", etc.
3. Outcome - (the finished product, how it should look)
4. Constraints and Conditions - (limitations imposed by tools, resources, ingredients, etc.)

E. Listing the Steps

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Remember, the steps are teaching tips for students to fall back on during their learning, and to use as reminders when they are explaining the task to their students. They should reflect important twists and turns in learning the task.

But as with criteria, we are not interested in "nice to know" material, but rather with "have to know or do" reminders. It is important to re-emphasize that modules are not "how to" manuals or programmed texts, they are designed to support the "show and tell" peer-teaching chain. The steps are merely reminders of what to teach and in what order; it is important not to overload the steps section with superfluous information.

Writing the steps required special thinking by the teacher about the reading level of the students and the relative difficulty of the check-writing task. Writing a check is filling out a form. The teacher felt that the most useful teaching aid might be a xeroxed copy of a correctly filled out check.

Along with this "accurate model", the teacher xeroxed a number of blank checks for the students' practice. At this stage, the check-writing module contained only two steps: (1) presentation of the correctly completed check, and (2) blank checks for the student to use for practice.

Step 4: Testing and Revising Modules

Writing effective modules always requires many drafts. There is no way to avoid this. If these modules are to represent a true "capital investment" - work that need not be repeated - they must be clearly written, their criteria must tightly blanket the task, their steps must be stripped of all but the guiding essentials, they must only contain what is necessary to support oral teaching.

Once the modules are written they should be tested by a "trial run" before being presented for student use. This means a trial teaching chain using the module with volunteer students. This simulation should test the conciseness and communicativeness of the module, and of how well its criteria and steps actually do support people teaching each other.

The number of volunteer students in the trial run depends on how much time is available, but we have generally found that by the fifth or sixth student one can spot most problems in the module. However, the "trial run" volunteers must be oriented to assist those supervising the "trial run" by paying close attention to their peer teaching and reporting how well the module supports it.

This special scrutiny of the modules during the trial run involves (a) the timing of the modules, (b) how well are the criteria derived and how well are they communicated between students, and (c) the helpfulness of the steps in both the learning and teaching phases.

The teacher tested the check-writing module with five volunteer students. Two related problems surfaced during that "trial run": (1) none of the students knew how to correctly write numbers as words. (2) several students required additional practice writing cents as a fraction. To solve the first problem, the teacher would either have to write a prerequisite module on learning to write numbers as words that would precede the check module, or teach the skill to students through a teacher-devised class lesson. The teacher wanted to avoid any delay that might lessen student interest or enthusiasm. Instead, she gave students a chart of correctly written numbers to use while learning, checking-out and teaching the check-writing module

To correct the second weakness, the teacher inserted a new teaching step which gave students who needed it special practice writing cents as a fraction.

The teacher revised the module and prepared the final version for student use. (See Appendix)

A. Timing

The "trial run" should uncover whether the task of a given module is an organic unit which can be completed by students of varying aptitude within a single learning session. The "trial run" observers should note the time it takes to complete each teaching session, starting when the teacher "primes" the chain by instructing the initial student, and continuing throughout the trial run. A module which takes most students longer than a single class period to learn might have to be trimmed. It might need splitting into separate sequential modules. Part of one module might need to be added to another. We have found that there is no optimum duration for a module. But a module that takes too long for most students to master can be a discouraging learning experience; the mastery test, which is supposed to strengthen student confidence, is delayed. The student must wait too long for feedback on his progress.

B. Criteria

The "trial run" examines the tightness of the criteria in the module. Do the criteria adequately cover the finished task and do they allow for all possible mistakes a student can make? If some criteria are given with permissable "margins of error", are they realistic, too large or too little? The volunteer students must help in answering these questions. Very likely the module writer missed some crucial criteria, or technical terms essential for the student to know were not clarified. The "trial run" is the time to discover that. Also, the trial run reveals how much of the criteria is successfully

communicated orally, without recourse to the written criteria. If there is too much reliance on written criteria, perhaps the module should be cut into two modules. When the volunteers in the "trial run" are unsure whether or not they have successfully completed a module they should be urged to explain why, or to note it down on a piece of paper. This means that two points of view - student, and "trial run" supervisor or teacher - are scrutinizing the modules for their comprehensiveness and clarity.

C. Steps

As with criteria, the volunteer students, teacher and/or module writer analyzing the "trial run" should pay special attention to how well the module's steps support the independent continuation of the learning chain. Students especially can help here by noting down their use of the steps -underlining those which are particularly helpful, adding new steps or special emphasis where they feel they are needed and indicating where a step is totally unnecessary, confusing, or out of proper sequence.

The following is an example of a checklist which can help in evaluating how well a module does its job during the trial run.

EVALUATING THE PEER INSTRUCTION MODULE

(Based on Observations Made During the Trial Run)

I. The Check-Out Test (Criteria)

☐ 1. Do students need more written explanation of criteria, or is the oral transmission sufficient?

☐ 2. Does the test completely cover all the things you want to see the students do? Or, if judging a finished product, does the test adequately describe how the finished product should look and/or function?

☐ 3. Is the language/vocabulary used to describe the test easily understood by the student? Does the student clearly know what he is expected to demonstrate?

☐ 4. Is the test organized logically according to the skill being observed. (i.e. If the student is demonstrating a sequential procedure, are the criteria listed in the correct order?)

☐ 5. Does the criteria include only essential performance skill or quality standards rather than "nice-to-know" information?

II. The Steps ("Teaching Tips")

☐ 1. Do the steps serve as an adequate guide or reminder to the peer instructor of what he must teach? Are all the critical manuevers/keypoints in the learning included?

☐ 2. Are there any steps or procedures that should be added to help support the peer instructor? Are there any that should be eliminated?

☐ 3. Are the steps written simply and clearly enough so as to be readily understood by the student?

☐ 4. Would the inclusion of diagrams make the steps more useful?

☐ 5. Are the steps listed in proper/logical sequence?

PUTTING THE MODEL INTO OPERATION

Step 1: Choosing the Setting

Once the modules have been tested and revised and are ready for students, the learning environment must be arranged.

Because it is a chain teaching method rather than a group method, peer instruction presents a unique problem for teachers. Students pass through one by one as through a single-lane tunnel, but accommodations must be made for those students not yet in the tunnel. Even when all students have entered the system and are busy learning a series of sequential modules, scheduling inevitably will produce lapses and dead time periods for students waiting to learn or to teach.

If instruction is to occur within a regular classroom schedule, the problem is to synchronize peer teaching with other class work so students will be constructively occupied while waiting to be paired with a peer instructor. Regardless of whether the teacher plans for all students to participate in the peer teaching during a fixed period of each day, or whether she plans to dovetail peer instruction in with other on-going learning activities, the logistical problem remains: how to constructively occupy students waiting their turn to join the teaching chain. Teachers should plan to have complementary worksheets, discussions, and other meaningful activities available.

The teacher wanted to use peer instruction during the period when students normally worked with self-instructional materials. This would insure that students not immediately engaged in peer instruction would be busy with other learning activities. She did not want to try it when the system would compete with teacher-directed activities such as reading groups.

Step 2: Preparing the Students

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Since peer instruction will be a new experience for most students, some orientation to the system is advisable. An exhaustive introduction would probably make students anxious, but the teacher should briefly sketch the broad workings of peer instruction by explaining that students will be teaching each other, that each pair - peer instructor and student - will be working privately and cooperatively to complete the criteria and that each student must be checked out before he can teach. Immediately after receiving this general outline students should be allowed to pick up the new method through direct participation.

Step 3: Priming the Teaching/Learning Chain

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Once the modules have been tested in trial runs and the students have been broadly introduced to peer instruction, the teacher "primes" the teaching/learning chain by teaching the first student "to the test". It is often expedient for the teacher to instruct two students initially, thus priming two chains and allowing students a more rapid entry into the system. The important feature here is the teaching "to the test". Both the teacher and student are given identical copies of the module so they work together toward meeting the criteria - as with an "open book" exam. When both feel confident the student can perform the task correctly and unaided, the student is ready to be checked out. The module's criteria usually require either that the student (a) actually does the task for the teacher, or (b) produces a finished product which satisfied the criteria. Once he passes all criteria successfully,

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The teacher briefly described how the system worked and explained that the material on using a checking account would be learned in a series of four separate sequential lessons. She reassured the students that they would get a clearer picture of how peer instruction worked by directly experiencing it. Then they should feel free to ask questions.

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Several students claimed they already knew how to write checks and could pass the check-test without practice or instruction. So the teacher gave them the check-test - they must correctly write a check using information (name and amount) the teacher supplied. Both students passed the test, and then became the first peer instructors and were paired with two new students. Once they fulfilled their teaching roles, they were eligible to learn the second module in the checking account sequence - filling out a check record.

the student shifts into the teaching role. If he fails the criteria check-out test, he continues to work with his teacher until he does pass it. If there are other modules in the sequence, and if they are interdependent and serial, when the first student has fulfilled his teaching role for the first module he may learn the second module from the teacher, and so on.

The check-test can serve as a pretest or diagnostic test as well as post-test. If teaching a series of interdependent sub-tasks, some students may already know how to do some of the initial tasks. If a student thinks he already knows a skill, he simply takes the check-test for that unit. If he passes the test, he becomes a peer teacher for that module. After he finishes teaching the skill to someone else, he can learn the next module. If he fails the test, he simply works with a peer instructor until he can pass.

When the teacher is overseeing peer instruction, he is in the new role of a classroom manager whose new responsibilities are (1) to write the instructional modules, (2) to prime the system by teaching the initial student, (3) to maintain quality control through administration of the criteria tests, and (4) to maintain a smooth functioning of the learning chain through skillful scheduling which interweaves the peer instruction with other learning activities.

Scheduling for peer instruction involves matching peer instructors with appropriate students and arranging the timing for the work sessions. Due to the nature of one-to-one teaching, this scheduling system often resembles making "appointments" more than posting lists of group classes and times. The main rule of thumb is that students should be checked out on their modules and then teach them as soon as possible after their learning experience. We have developed "on demand" formats for scheduling peer instruction, cumulative rosters for students learning given modules. The last name on each list represents the latest link in the chain, the latest student who has passed his mastery test for the module and is waiting to teach. Thus, once a teaching chain has begun, all students could schedule themselves through the roster which the classroom manager merely keeps up to date. These cumulative lists can also serve as a record for the teacher of who has mastered which skills.

For the banking modules, the teacher posted a teaching roster for each module which contained the names of people who just passed a test and were waiting to teach. Students were encouraged to pair themselves up, keeping in mind three general rules: (1) they must move through the modules in sequence, starting with the check module, (2) they must pass the mastery test before they could teach and (3) they must teach the just-learned module before going on to learn a new one.

Occasionally "on demand" scheduling is not appropriate. When the teacher feels an individual student is capable of mastering a particular skill, but is unable to transmit it because of a communication handicap, the student can join the chain as a learner but is not asked to teach. Also, when a particular twosome cannot work together productively - whether the result of personal or scholastic differences, the teacher should find new partners for them.

A CHECKLIST

In the preceding sections we have described how to design and implement the HumRRO peer instruction model. The following checklist may help you remember and review key points in the manual as you begin designing your own peer instruction system.

I. The Main Features of the HumRRO Peer Instruction Model

A. Students teach each other.

B. A student must pass a standardized performance test before being assigned to teach someone else.

C. The student must pass every item on the test before becoming a peer instructor.

D. Material to be learned must be broken down into single session teaching units, or "modules".

E. Students work at their own pace.

F. If a student fails a mastery test, he continues to work with his peer instructor until he successfully masters the material.

G. Students receive one-to-one instruction which assures them of immediate, precise feedback while they are in the act of learning.

II. Why Use Peer Instruction

A. Provides individualized instruction for the student who has difficulty working with self-instructional materials.

B. Provides the student with the special advantages of a one-to-one learning situation. Students receive: (1) individually-tailored practice, (2) precise feedback, and (3) personal acknowledgment of achievement.

C. Allows for irregular student attendance.

III. When to Use Peer Instruction

A. Five (5) minimum conditions must exist before electing to try peer instruction:

1. Sponsoring agency or institution must commit sufficient staff to (a) prepare support material, and (b) manage the system in operation.
2. There should be set a minimum of eight (8) students who want or need to learn the exact same skill.
3. All students must be able to communicate with each other.
4. Skill must be commensurate with student ability and motivation.
5. There must be only one way to correctly perform the desired skill (if it involves a process) or only one way to complete the finished task (if it involves a product).

IV. Writing and Test Modules

A. Peer instruction modules have three functions:

1. To provide teachers with an instructional plan.
2. To support "oral" peer teaching.
3. To spell out the "check test" (criteria)

B. Module writing steps:

1. Find a curriculum source.
2. Break content down into sequenced sub-tasks. (To qualify as a single module, each unit should have some self-contained unity or completeness.)
3. Head module with a simple task statement that spells out what the student is able to do when he has successfully completed the module.
4. List special materials or equipment required for the teaching and learning.
5. Derive performance criteria statements, composed of the following five parts:
   a. Who
   b. Actual Behavior
   c. Outcome
   d. Standard of Performance
   e. Constraints and Conditions
6. List the steps or critical reminders necessary to support the oral teaching.
7. Test modules for accuracy, completeness and effectiveness in a "trial run" with volunteer students.

V. Putting the Model Into Operation

A. Choose a classroom setting for Peer Instruction

B. Teachers should plan to have constructive learning activities available for those students not engaged in the teaching chain.

C. To prepare the students for peer instruction, the teacher should present a brief sketch of how the peer teaching system works.

D. Immediately after outlining the workings of the system, teachers should allow students to learn the new method through direct participation in it.

E. To "prime" the teaching chain for each module, the teacher simply teaches the first student "to the test".

F. The teacher and student work together until they both feel the student can pass the performance test.

G. Once the student successfully passes the test, he shifts into the teaching role and serves as a peer instructor for another student.

H. Once the first student has fulfilled his teaching role for the first module, he learns the second module from the teacher, and so on.

VI. Managing the System

A. The teacher is cast in the role of classroom manager with four major responsibilities:

1. To write the instructional modules.
2. To prime the system by teaching the initial student.
3. To maintain quality control through administration of the criteria tests.
4. To maintain a smooth functioning of the learning chain through skillful scheduling which interweaves peer instruction with other learning activities.

B. Scheduling involves pairing up peer teachers with learners.

1. The general rule is that students should be checked out on their modules and should then teach them as soon as possible after their learning experience.
2. Teachers can use a simple "teaching roster" which contains the names of people who have passed the mastery test and are waiting to teach as a scheduling aid.
3. The "teaching roster" serves as a record for the teacher of who has mastered which skills.

WRITING A CHECK

Task: Student must correctly and neatly write a check.

You Need: 1. A Pen

Check Test: Completed check must:

(Check if correct)

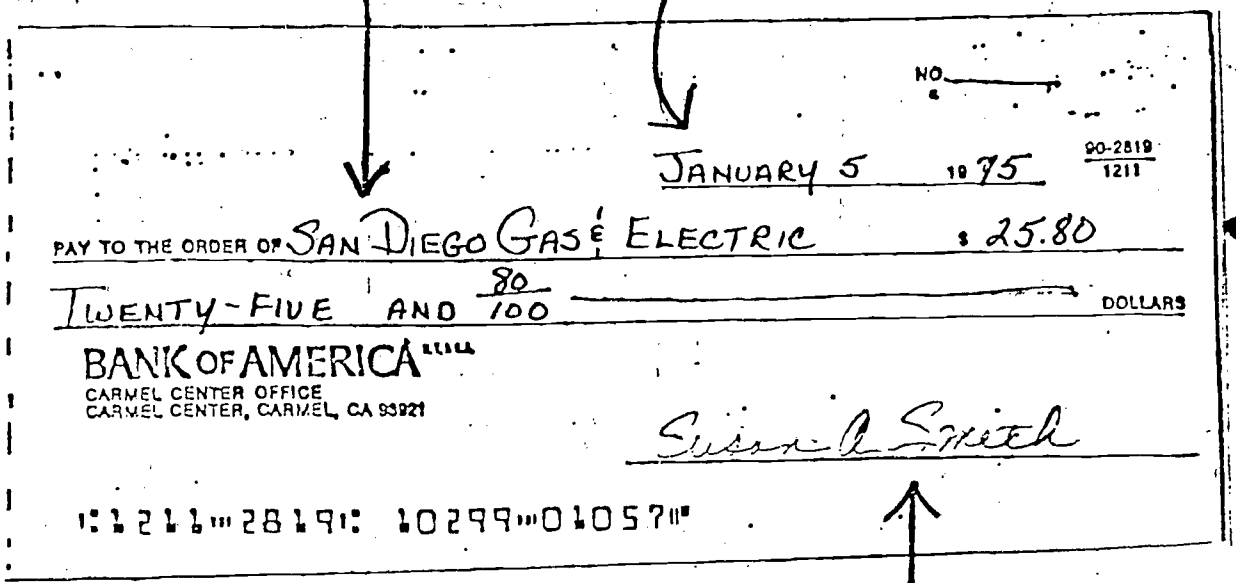
- ☐ 1. Be in ink.
- ☐ 2. Have all words spelled right.
- ☐ 3. Be neat and readable.
- ☐ 4. Have the amount in numbers written close the $ sign.
- ☐ 5. Have the same amount in both words and numbers.
- ☐ 6. Have the amount in words begin at far left edge of the written line, with dollars in words and cents written as a fraction. $\left(\frac{\text{cents}}{100}\right)$
- ☐ 7. Have a line drawn after the amount in words.
- ☐ 8. Have no crossouts, erasures or changes.

STEPS

1. Check

(2) Name of person or company you are paying.

(1) Date
(3) Amount in numbers. Write it close to $ sign.



(4) Amount in words: $ in words and ¢ as a fraction ¢/100

(5) Always sign your name last. Sign it the way you always sign your name.

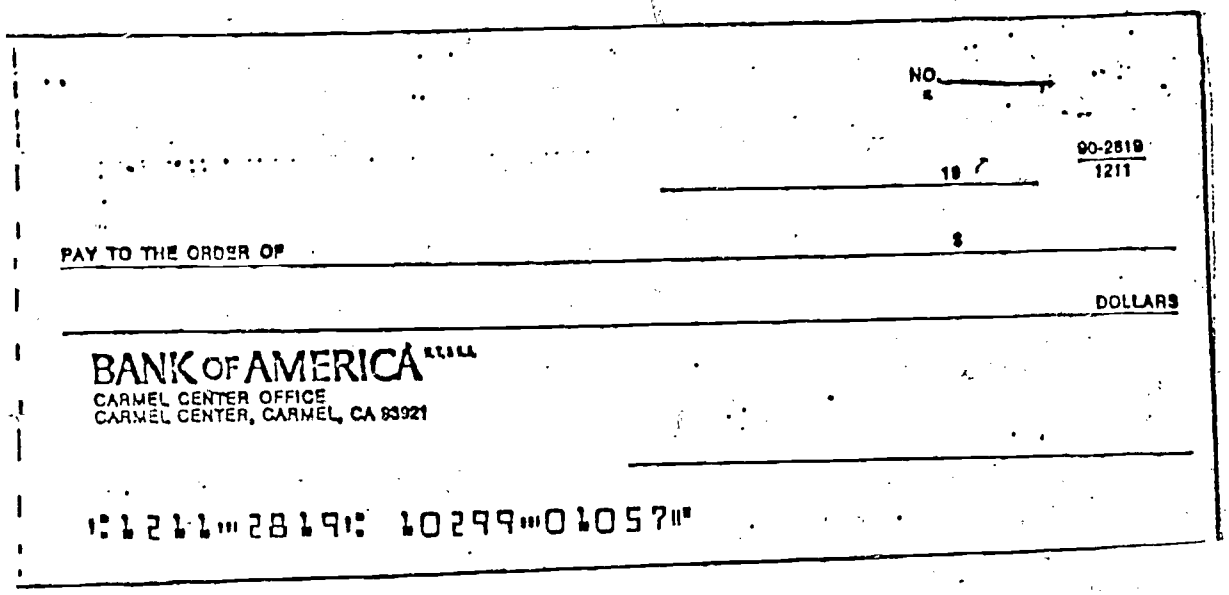
2. Practice writing numbers as words:

Write the following numbers as words. Use the chart to help you.

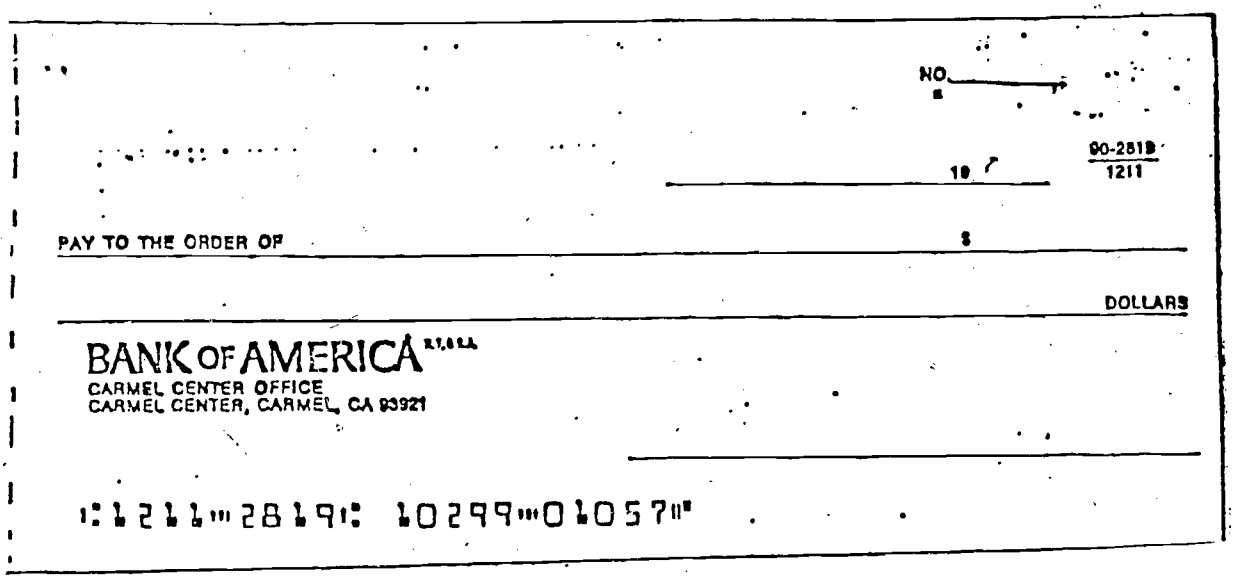
	Numbers	Words
Example -	1. $10.15	1. TEN AND 15/100
Example -	2. $25.50	2. TWENTY-FIVE AND 50/100
	3. $42.30	3.
	4. $21.30	4.
	5. $46.80	5.
	6. $55.70	6.
	7. $24.03	7.
	8. $18.45	8.
	9. $73.25	9.
	10. $36.17	10.

3. Practice Writing Checks

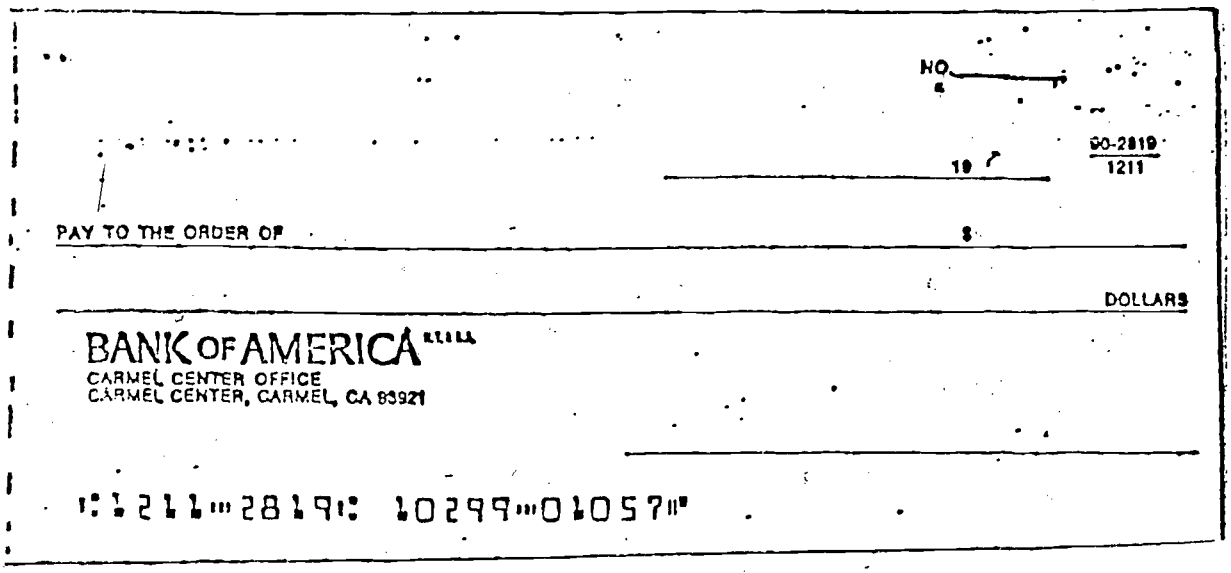
(1) Write a check to Mr. Bill Jones for $31.50.



(2) Write a check to San Diego Telephone Company for $30.75.



(3) Write a check to Sears Roebuck & Co. for $42.00.



4. Now take the CHECK-TEST if you are ready.

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