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August 8, 1979

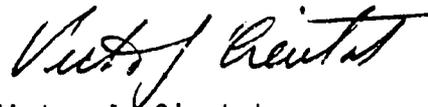
Contracting Officer
Regional Operations Division-Africa
Office of Contract Management
U.S. Agency for International Development
Department of State
Washington, D.C. 20523

RE: Contract AID/AFR-C-1494

Dear Sir:

I enclose three copies of our report on the Bloomington Conference on Instructional Technology (8-11 January 1979), as required by Clause 16(a) of the General Provisions of our contract for the Improved Efficiency of Learning Project in Liberia.

Sincerely yours,



Victor J. Cieutat
Director of Support Services

VJC:mm
Enclosures (3)

cc: USAID/Liberia (w/5 enclosures)
Richard R. Solem (AFR/DR) (w/1 enclosure)
AID Reference Center (w/2 enclosures)
Daryl G. Nichols (w/10 enclosures)
IIR Field Staff (w/10 enclosures)
File (5)

PN - AAL - 146

Institute for International Research Inc.

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Subject: BLOOMINGTON CONFERENCE ON
INSTRUCTIONAL TECHNOLOGY
(8-11 January 1979)

Cooperating Country: LIBERIA

Contract Number: AID/AFR-C-1494

Project Number: 669-0130

Date: AUGUST 1979

BLOOMINGTON CONFERENCE ON INSTRUCTIONAL TECHNOLOGY
(8-11 January 1979)

Purpose

The primary purpose of the Bloomington Conference was to explore a wide range of programmed instructional techniques as a means for implementing Programmed Teaching and Programmed Learning in rural Liberian elementary classrooms. The main constraint upon which conference attendees focused was the need to provide unqualified teachers of 40 or more children with programmed teaching techniques even though previous uses of programmed teaching typically were successful in only small groups of 15 students or less.

A second purpose was to arrive at a first approximation of programmed instructional techniques to be included in the four-week Writers' Workshop to be held in Gbarnga beginning in early March.

Participants

Douglas Ellson	Indiana University
Robert Jacobs	Southern Illinois University
Darlene McSoley	Indiana University
Daryl Nichols	Institute for International Research
Jean Osborne	University of Illinois
Jerry Short	University of Virginia
Paul Spector	Institute for International Research
Harold Stolovitch	University of Montreal
Sivasailam Thiagarajan	Instructional Alternatives

Procedure

After a presentation and discussion of what was known about the Liberian project, conditions in rural schools of that country, and the purposes of the conference (above) it was decided to explore a variety of techniques with which participants were familiar and to draw upon that knowledge in determining what approaches might be most fruitful for use of programmed teachers in Liberia. Thus, there was no set agenda; the conference was an open discussion from the beginning.

SUMMARY OF CONFERENCE NOTES

Without a fixed agenda, it was thought best to keep notes of comments and presentations made by the several participants and to organize them at a later time. As the reader will soon see, this format did not lend itself to continuous discourse.

Points to Bear in Mind and Questions to be Answered:

1. By the close of the Conference, we will need a blueprint for the possible modes of learning and the possible types of classroom management systems which might be employed.
2. What are the kinds of learning to be addressed? The answer to this will have to be answered from the Liberian curriculum.
3. We must remember that our primary focus is to be on improving instruction through the technology of programming. The various systems with which we are familiar, and which we will discuss this week, are a "reference library" of programmed technology.
4. The point of focus of the IEL Project is the unqualified and the underqualified teacher.
5. We need baseline data on the results of pupils of qualified, underqualified and unqualified teachers.
6. This project needs an objective that guides everyone's daily actions such as:

All Liberian children should learn useful things from the system.

The system developed in the Project should not be thought of as an experiment only; it should be thought of as something that will last for 20 years and will affect many lives.

The project must keep its focus on children's learning.

It may help in answering the above question to ask: What is done after the five years of the project are over and the contract is terminated? What will be enduring?

We must keep in mind that this is not an American project. It is a Liberian project to meet Liberian needs.

Several Approaches to Programmed Teaching and Learning

Note: Most programmed learning systems are in fact programmed teaching systems. This is critical because, although the system is supposed to relieve the teacher of many tasks, it often adds to his or her burden.

MADRAS OR MONITOR SYSTEM

1. Originally begun in Madras, India (Thiagi's home town) and picked up by Lancaster and Bell in the 19th century and brought back to the US and Great Britain.
2. There is little information on how Madras tutors or monitors were taught although we know that it was largely a system based upon repetition.
3. The Lancaster system was an extremely precised management system. Lancaster left Great Britain and went to Philadelphia and set up what was to become the first normal school in the US.

WINFIELD SYSTEM

1. Originally used in China.
2. He programmed his course on fundamental science before he left China.
3. His program tells precisely what the teacher is to do at all times, and is really a form of incomplete programming.

NESBIT SYSTEM

1. Nesbit was a Colorado school teacher who got turned off by lecturing and developed what is essentially an early form of programmed learning.
2. He used cards with questions on one side and answers on the other, and he anticipated many of Skinner's ideas.
3. The majority of Nesbit's instructional programs were games, usually for groups.

ROSENBAUM'S PEER-MEDIATED INSTRUCTION

1. This system has been used down to the third grade level. (a) Peer-pairs are selected randomly. (b) There are tutor and learner books. (c) Children take turns being tutor and learner. (d) The pupil who is the teacher corrects the learner's book and marks it. (e) The learner answers stimulus questions. If incorrect, he or she answers again. If wrong again, the right answer is provided by the tutor. (f) After a while, pupils switch roles.
2. The system has been used to teach adults English, third graders Spelling, and 7th and 8th graders Mathematics.
3. In one experiment with 25 experimental schools and pre- and post tests, the experimental gains in remedial reading were 13 times better than the control schools.
4. The system combines conventional teacher activities with a simple peer-tutoring system. and results are impressive.

HARRISON'S SYSTEM

1. The approach is more complex than Rosenbaum's but simpler than Ellson's. Operational programs and content are put together.
2. He has written it in a form that looks like a teacher's guide.

ELLSON PRESENTATION

Dr. Ellson made a presentation of his approach to programmed teaching and tutoring. Highlights were a description of a basic program, a chain program, and a nested program. He went further to describe lesson programs, syllabus programs and script programs. His full system has been reduced to one basic operational program (stimulus-response-feedback) that can be combined in a variety of ways for different content and skill learning.

Some points made by Dr. Ellson regarding the application of programmed teaching to groups of students:

You can ask students to respond together, but the ones who need it the most do not get the necessary extra practice. It is best, therefore, to present the stimulus to individual students first before asking for group response. (Note: This is a major point of difference of Ellson's approach and Engelmann's direct instruction.)

The criterion for mastery learning should be one complete run through the set of items to be learned where the child responds without errors and without prompts. Any items on which a child makes errors are marked with an "X." Only these items are repeated in subsequent runs. After all items are responded to correctly in this fashion, the child is required to answer all items correctly in a single run.

Games are excellent vehicles for programmed group instruction, particularly team games. The rounds game, as used in Malaysia and the Philippines, ensures appropriate distribution of learning tasks among pupils. Games maximize pupil time on task and minimize teacher time.

HIGHLIGHTS OF THE IMPACT SYSTEM

1. Beginning students are taught in small groups of 6 to 10 students by older elementary students who spend one hour each day with the beginners. The younger students always have an older-student programmed teacher because the older students are scheduled for different hours throughout the day. Grade 6 students teach those in Grade 1. Grade 4 teach Grade 2. Grade 5 teach grade 3. This procedure allows the most mature (6th Graders) to teach the beginners in Grade 1, and it insures that at least two years separate teacher and learner.

Question: Will there be any possibility of using cross-age teaching in Liberia? If not, can we expect at least the possibility of short stints (say 15 minutes) of cross-age tutoring?

2. Older student in the 4th thru 6th grades learn primarily in peer groups, taking turns playing the role of group leader. Leader's Guides and Learner Booklets are used. There is a core curriculum (continuum) which all must pass, and there is an advanced curriculum which those must pass who intend to go to secondary school. One hour each day is for individual pursuits. The more able spend this hour on self-instructional materials in the advanced curriculum, while the less-able devote this time to review of peer-group learning materials of the core continuum.

3. In the Philippines:

Schools are trilingual, with English and Pilipino as second languages. All students are expected to read and understand English by the fourth grade.

IMPACT schools are ungraded; peer-groups progress at their own rate.

The first two & one-half years (approximately) are spent in peer groups under the tutelage of older student programmed teachers.

The last part of the third year is a period of transition from programmed teaching to peer-group learning. Simple peer-group programmed learning modules are used, and a fifth grader is in attendance to assist them.

The last three years are spent in peer-group learning and self-instruction.

There are two itinerant teachers who are able to serve ten schools, spending one-half day each week at each school. They teach music, art, scouting, etc.

The IMPACT system works. Students perform better than others who went through the same schools earlier in the traditional system, and they perform better than students in control villages in the same region of the country. And this is accomplished for one-half the cost of conventional education.

Crucial to the success of IMPACT, and equally crucial to the success of IEL in Liberia, is the management system, i.e., the system to be used within the classroom, within the school and among all schools. And it is not only the management system design that is crucial; it is the day-to-day monitoring and supervision that is essential.

A question was raised concerning the opportunities for socialization among children in the IMPACT system. Answer: Peer-group learning and cross-age teaching and tutoring offer many opportunities for socialization - better than is offered by classes in conventional schools where teachers lecture and children are not given as much opportunity to participate in their own learning activities. Reports from secondary schools in the Philippines in which IMPACT graduates are enrolled are that there is something different about the approach to learning of IMPACT students. They appear to be more self-reliant and self-directed in the management of learning time. They are not waiting to be taught by a teacher.

One problem which may occur in Liberia is that conventional teachers may not believe that children can teach children.

IMPACT has shown that this belief is untrue, but teachers world wide have two common taboos: One is that tutors can't teach. The other is that tutors can't learn by teaching. In general, teachers believe that children can only learn from teachers in the classroom.

HIGHLIGHTS OF DISTAR

It is available in Reading, Language and Mathematics for Grades 1 through 3. There also is a new Corrective Reading program. Language and Reading are completely integrated. One important key to DISTAR success in the US is its tightly meshed continuum.

It is the only program(or one of the very few) in the US which has consistently been successful in the teaching of the disadvantaged child. It is a tightly structured program, and in tough situations this structure does make a difference. Learning tasks have to be instructionally valid. It doesn't teach things that are not germane to the main task, and it keeps a high level of "time on task" in that most of classroom time is spent on instruction.

What happens in a DISTAR classroom?

Everything is scripted.

DISTAR uses small groups where it has been found most learning takes place.

On-site training is critical, and non-professionals can be trained as well as professionals. Teachers are taught to read the script that accompanies each learning task.

In class, 80% of student responses are in groups, and only 20% as individual responses. This approach gives children as much practice as possible, keeps them busy and keeps them under control. (Note: This is one essential difference from the Ellson approach which focusses on individual response.)

Learning groups range from 5 to 15 students. The weakest learners sit directly in front of the teacher, and the teacher sits on the same-sized chair as the students so that he or she is able actually to touch the children in front. By watching the weakest children, the teacher can see when all in the group probably have learned.

Each teacher learns a very precise set of signals (touching stimulus card with pencil, clapping hands, snapping fingers, etc.) which the children quickly learn as signals for their response. Signals insure that all in the group respond at the same time so that the weakest do not wait to repeat what others in the group say.

The teacher models and the group repeats at the outset. Later, the teacher signals for a response without modeling. When the teacher senses that one or more of the children are responding incorrectly (or not responding at all), s/he models, asks for group response, and then asks for individual response from the weak learner.

DISTAR is a heavily oral program. It uses lots of pictures and manuals. It is very expensive in terms of materials

The system never goes on with tasks that a child cannot accomplish after two minutes because it is both instructionally unsound and emotionally defeating for the child. You can teach the middle child in a group and bring the weaker ones up later by working with them as individuals.

A question was asked about the possibility of using children as DISTAR teachers.:

In the first grade, children can help each other practice, or they may be able to show and tutor each other. By the third grade, children can actually teach.

Characteristics of a good DISTAR teacher:

A good sense of pacing. Knows when to go fast and when to go slow and when to alternate group and individual responses. Follows the formats and short cuts only after s/he really knows the stuff. Listens to children. Knows how to correct.

DISTAR and other forms of programmed teaching and tutoring are compatible, and both technologies should be used.

Teaching/Learning Methods for Large Groups, Small Groups, Pairs and Individuals

The conference made a rough attempt to come to grips with the problems and opportunities represented in the IEL Project for the use of a variety of programmed technologies. On the next page is an approximate listing of the many types of programs available for different sized student groups. The listing is a track of group brainstorming.

LARGE GROUPS (16 to 50 Students)

Heavy choral response as in the USIS method.

Answer wheel in which students hold up a color wheel to indicate response choice.

Script program: The sort of thing that would be used on the first day to introduce kids to school. A script program is something read to children that does not require student response.

Text is a type of script program. It is a story or information read to students as a group.

National Anthem, Singing, Prayer

Entertainment such as a visiting magician or dance group.

Field trips

Demonstrations, i.e., showing how something is done accompanied by a commentary.

Games for large groups.

Large group projects such as gardening.

Physical education and choral music.

Drill.

Listening to a radio broadcast.

SMALL GROUPS (3 to 15 Students)

Programmed teaching by teacher, aide, older student or peer. At present, the IEL project is limited to teacher and peer-led group learning. The Project should have greater flexibility to use the full variety of potential human resources.

DISTAR for programmed teaching.

Instructional games in programmed teaching formats.

Small group learning, including peer-group learning for older students much as is used in IMPACT. There may also be some leaderless small-group learning such as games or discussions or projects.

PAIR LEARNING

Tutoring by teacher, aide, older student or peer.

Two-person games and puzzles.

Peers learning side by side using self-instructional materials. (Could be adapted from some of the learning strategies of Project RIT in Thailand.)

Projects.

INDIVIDUAL LEARNING

Programmed self-instruction with an individual student interacting with programmed materials.

Individual study of unprogrammed materials, such as homework assignments from textbooks.

Individual games and puzzles and projects.

A Possible Scenario for IEL

<u>Grade</u>	<u>Learning Mode*</u>
1 (1st Week)	Large Group Script Programs
1 (Thereafter)	Programmed Teaching in Small Groups Peer Tutoring Cross-age Tutoring
2	Programmed Teaching in Small Groups Peer Tutoring & Teaching Cross-age Tutoring
3	Programmed Teaching in Small Groups Simple Peer-Group Learning
4, 5 & 6	Programmed Learning: Peer-group Learning Self-Instruction

*As each new method is introduced, the teacher will have to demonstrate before the class with a small group, or a pair, or an individual. After demonstrating, there should be guided practice in the learning technique before they are released to do it on their own.

Points to Retain

Note that there was not complete agreement on all points below, although most of those outlined were agreed upon.

> All good tutoring systems use Stimulus-Response-Feedback, and it is this essential point that makes all these systems work.

> Mastery is insufficient. Learning can be forgotten rapidly. Children have to overlearn to the point of automaticity.

>Reasons for success of Rosenbaum and others:

Provide practice that conventional classrooms do not have the time or the techniques to support.

Children receive much more individual attention.

Immediate feedback is always given learners.

Errors are not accepted. Learners must make correct responses.

>To avoid resistance from conventional teachers, they must be brought to realize:

Programmed Teaching and Learning provides essential practice.

Individual attention is available to each child.

The project will provide teachers with the means to allow him/her to delegate responsibility.

Learning is the essential purpose of school, and learning need not be equated solely with teaching.

>Programmed Teaching and Learning has positive effects on the children because they experience success and on the programmed teachers because they succeed.

>Some parts of the curriculum will require teaching plus commentary. How can this be programmed?

One way is to look very carefully at the organization of the subject matter, produce automaticity at each step before going on to the next level of complexity.

If you can produce automaticity at one level, pupils can learn how to jump to the next level.

>Heterogeneity of ability of students in groups appears to be preferable to homogeneity. The more-able can assist the less, and the tendency toward systematic support of elitism is avoided with the result of greater socialization and common purpose.

>Pupil, subject matter, teacher, and cultural characteristics all determine the most effective instructional program.

>Self-instruction is deadly boring if used too long. It is most appropriate for homework and for individual enrichment or advanced study.

>Materials should be developed for the upper grades that are appropriate for peer-group programmed learning that can also be easily adapted for self-instruction. This procedure will allow greater flexibility for self-remediation, for homework and for the makeup of absences. To develop self-instructional materials that can be adapted to peer groups is the wrong way about.

>Design content programs that can be used with or without a teacher or tutor.

>The higher the grade, the greater the number of possibilities for independent learning.

>The classroom management system should be designed only after extensive visits to the schools in question.

There are two important factors which appear to influence outcomes on all programmed approaches:

Time on task

Frequency of learner response

We must retain these two key elements in all we do!

Some management questions which should be answered:

Which grades sequence is to be developed? If the projected 1 & 4, 2 & 5, 3 & 6 sequence is followed, there will be difficulty at grade 4 in introducing programmed learning because it is unlikely that the majority of students can read and comprehend well enough for this technique to be successful. Perhaps the first year should be grades 3 & 6.

Will it be possible to have cross-age programmed teachers or tutors? Both grade levels benefit. It would be unfortunate if the project is so constrained.

Will it be possible within a school to reassign teachers for maximum effectiveness? For example, it may be found valuable to assign a 5th or 6th grade teacher to the 1st grade. The upper grade students are able to take greater responsibility for their own learning and, thus, require less attention from a teacher. The younger students require more direct interaction with teachers. There is also the matter of having more students in the early grades than in the later grades.

It was the concensus of the Conference that:

The project should begin with the 3rd and 6th grades.

Conduct of the experiment in the schools should be delayed from a start of March 1980 to a start of March 1981. With the project being initiated later than planned, there will be insufficient time to prepare quality learning materials and procedures.

If necessary, combine the 5th and 6th graders under one teacher in order that one teacher can be freed to assist in the lower grades.
