

THE FORUM

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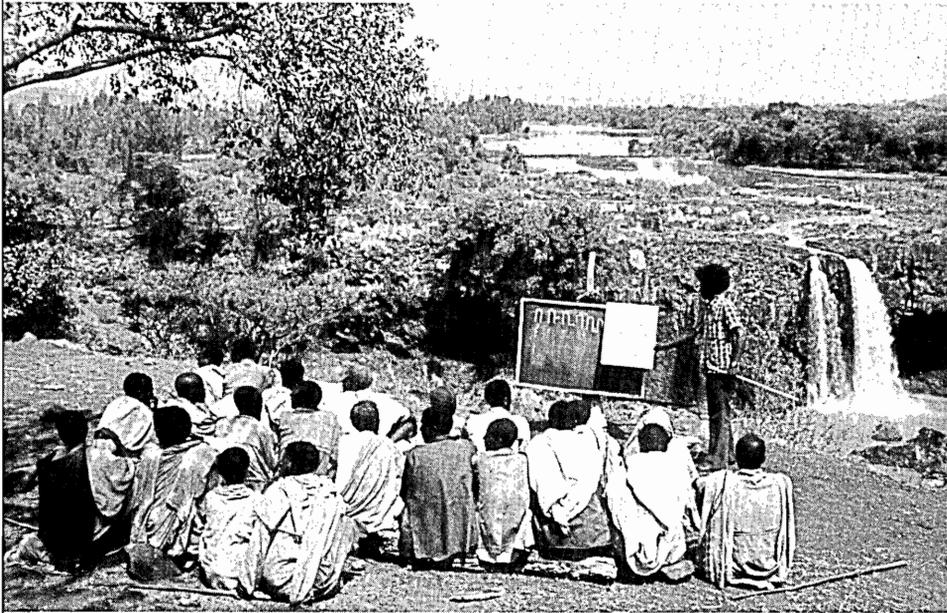
For Advancing Basic Education and Literacy

Teacher Training for Teacher Learning



To Our Readers

On Teacher Training and Teacher Learning: Theory and Practice



What is the sound of one hand clapping?

What is the sound of the wind without trees and sand? What is the sound of water without wind, rocks, and waves? What can we imagine about the sounds of the training session pictured on the cover photo? We can imagine the sounds of the waterfall in the background and the wind blowing through the tree. But what are the sounds of the voices of the people? The majority seem to be listening to the sound of one person's voice. What is that person saying? Are the words presenting theoretical or practical descriptions? What is the difference and why is it important?

Theory refers to systematically organized knowledge applicable in a relatively wide variety of circumstances and is different from practice, or carrying out in action. One without the other is the sound of one hand clapping.

The cover photo illustrates a fundamental assumption of the general education model learned in teacher training institutes: that the most effective and efficient way of conveying knowledge is by way of lecture format. It is based on the theory that all people are (or should be) the same. However, research shows that there are many kinds of intelligence and many ways of knowing and learning at different times, according to the individual and circumstance. Training that focuses on one style of education prepares most teachers to teach students in a way that excludes many types of intelligence for one way of knowing, in a specific order at a particular time that is not the same from one student to the next. It also prepares teachers to teach students at one level. This may be the slowest, the average, or the best students, but the content, pace, and scope of teaching is addressed to those students only and ignores the diversity of students within the class.

A critical departure from this approach to teaching and learning is shown in the picture on page three. The trainees in this picture have left the observational site by the waterfall, walked to the rivers' edge and entered into the water. This group is actively engaged in an experiential process that includes many kinds of intelligence: linguistic, logical-mathematical intelligence, bodily-kinesthetic intelligence, and interpersonal intelligence. One imagines a dynamic that is more collaborative as they search the waters. Together they see different things from different perspectives. One person stoops and holds a net in the water, another stands nearby gesturing with her hand, another with pant cuffs rolled up stands in the water. Their facial expressions show different responses that imply different interpretations of the same experience—one seems delighted or amused, while another seems repulsed or revolted by the encounter.

In practice we see that people have different responses to the learning environment. Different people interpret the same experience to mean different things, and people also differ in the kind of experiences from which they learn. The last issue of The Forum (Vol. 1, Issue 4) contained articles indicating that to achieve equity in the distribution of knowledge our educational systems must operate with and upon differences. This issue of The Forum applies this principle of knowledge distribution to teacher training and teacher learning. The authors of articles contained herein stress the importance of diversified approaches to teacher training and teacher learning. Policies which support combinations that include preservice and inservice training based on methods of teaching that recognize plurality in ways of learning and knowing will more effectively help us achieve the goal of quality education for all.

— Christina Rawley, Editor

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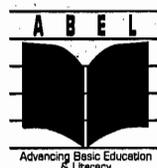
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The Critical Need to Train More and Better Teachers

Education is the single largest modern wage sector employer in the world. Over 19 million teachers are employed in the primary education sector alone, more than 9 million of whom are in low-income countries. Hundreds of thousands of additional primary school teachers are needed to maintain current enrollment levels. Over 4.5 million teachers are needed in China and India in order to achieve education for by the year 2000. Over 3 million teachers are needed in other low income countries.

Throughout history, teachers have been held in high regard. But today teaching holds a low status. The teaching profession is generally not well paid, conditions are poor, and career paths are uncertain. In particular, it is difficult to attract qualified and highly motivated people to the profession at the primary level. Some countries experiencing rapid expansion of their education system have been forced to recruit school age children, barely out of primary school themselves, to meet the growing demand for teachers.

It is startling to find that, although the importance of specialized training is acknowledged in all professions, the majority of teachers in low-income countries are not adequately trained. However, it is even more surprising to learn that there is little research evidence to show positive effects of teacher training in terms of learning outcomes. In fact, some policymakers argue that teacher training is not worth the investment. In an age of technological fixes it has been easier to show the obvious impacts of material inputs such as textbooks. We are less able to evaluate process inputs inherent in good teaching. We have also severely misjudged the processes by which people learn. Until recently it was broadly thought that the ability to learn

was a function of intelligence and that intelligence could be accurately measured by I.Q. tests. Current research in neuropsychology points the way to expanded views of intelligence that will be the basis of the new schools of the future.

education systems will vary from country to country in the combinations of strategies to provide and improve teacher training. The important message in this article is that countries should try to optimize the mix between general education, preservice training and inservice training.

Another important observation is that higher cost does not necessarily produce higher quality in terms of learning outcomes, but process and teaching ability and styles do.

Ellen van Kalmthout and Barbara O'Grady discuss teacher training

programs in Pakistan, comparing preservice with inservice programs that achieved mixed results, some of which would lead you to decide not to invest in teacher training programs. Fernando Reimers discusses some of the reasons why the existing evidence on the contributions of teacher training to the quality of education is so mixed.

The fourth article in this issue picks up where he leaves off. Reimers ends by saying that innovation and change in education systems require different research methods to document the contributions of teacher training and of different training modalities. Mary Kennedy offers a description of a research agenda for teacher learning. The two articles following hers complement the discussion of this strategy. The article entitled "Beyond the Three Rs: Developing All Seven Forms of Intelligence" (page 9) outlines the theory of multiple intelligence put forth by Harvard University professor, Howard Gardner. Liping Ma presents a Chinese approach to teacher training/teacher learning in an interview with veteran Shanghai teacher Yu Yi. Reading about Yu Yi's thoughts on teacher training supports the wisdom of multiple approaches to learning through

New Teachers Required in Year 2000 to Achieve 100% Gross Enrollment (in 1000s)					
GNP per capita	Estimated 6-11 yr old population (2000)	Current teaching force (1985)	Teachers needed at current student/teacher ratio (2000)	Teachers lost at 3% attrition	Teachers needed (with 3% adjust. for attrition)
Low*	154,448	1,727	3,965	1,076	3,314
China and India	268,314	7,244	8,335	3,473	4,564
Lower middle	136,570	3,543	4,421	1,756	2,635
Upper middle	118,335	3,778	3,956	1,725	1,902

*excluding China and India

Source: The World Bank

Robert Sternberg of Yale University points out that there are three kinds of intelligence: (1) Componential (verbal and mathematical-logic), (2) contextual (used in creating new environments), and (3) experiential (practical). Componential intelligence can be tested by an IQ test, but not the other two. Other research has shown that there are as many as seven kinds of intelligence.

These theories have strong implications for how we teach teachers to teach. Articles in this issue of *The Forum* offer evidence of new explorations in policy research and applications of teaching/learning processes that support a diversity of approaches to improved teacher training and teacher learning.

The first article by Theresa Tatto and colleagues presents a combined approach to teacher training studied in Sri Lanka. We selected this article to begin the issue because it clearly illustrates positive results in terms of student achievement outcomes as a result of three different models of teacher education. In addition the article outlines the relative differences according to goals, duration and location, entry conditions, content, degree of supervision, approaches to training and costs. National

theory and practice: "Without the revelation of the wisdom of teachers, the genius of educational theory will be the single hand that is never able to clap."

The need for multiple strategies for training more teachers is discussed in an article on page 14 which points out the need for more women teachers, particularly in the countryside. In rural areas this requires inservice training to ease formal education requirements and local-school, local-teacher options for increased effectiveness.

To further balance out theory with practice, the last two articles are written by two teachers in very different settings. Mary Ng writes about how lessons learned in the Philippines were later applied to a literacy program started on the Pascua Yaqui Reservation in

the United States. *Innovators in Education*, a regular column in *The Forum*, is written for this issue by Tom Cavanagh about a game he helped develop for use in a teacher training program in Malawi. The Malawi game is an example of the use of a training technique that stimulates a learning process alternative to the traditional lecture format. It was selected as an example of a training method that synthesizes new theories of multiple intelligences within and among people because it stimulates the linguistic, logical, spatial bodily-kinesthetic, and interpersonal intelligences. Simulation gaming also allows teachers to experience the "four Cs" of teacher learning: context, comprehension, connectedness, and complexity.

• **Context**-participants are required to participate in a change from lecture mode to

participation where teachers can learn to teach in more powerful and demanding ways.

• **Comprehension**-Teachers as learners transform the understandings they bring with them into better ways of understanding teaching.

• **Connectedness**-Teachers are required to connect the subject matter to experiences of decisionmaking during the course of the game.

• **Complexity**-Learning the intellectual and logistical aspects of managing ambiguous, dynamic and complex learning environments. ❖



Maria Teresa Tattio

Teacher training for teacher learning takes place in Sri Lanka with trainees who are actively engaged in a process that encourages participants to experience the subject at hand from several different perspectives.

Educating Primary School Teachers: Comparing the Effects and Costs of Different Approaches to Training Teachers

by M.T.Tatto, D. Nielsen, W. Cummings, N.G. Kularatne, and K.H. Dharmadasaln

In Sri Lanka a unique comparative study clearly shows the impacts of training on teacher behavior and student achievement.

Educational quality, as measured by pupil academic achievement, is a function of teacher quality. Teacher quality in turn is a function of the teacher's mastery of subject matter, knowledge and use of appropriate teaching skills, and acquisition of positive professional attitudes. Although it has been assumed that such knowledge, skills and attitudes are in part laid down during general education and are in part natural aptitude (teachers are born, not made), there is now conclusive evidence to show the importance of professional teacher training.

Although all teacher training programs have been established in order to influence the knowledge, skills and attitudes of teach-

ers, not all are equally effective. Moreover, it is not clear that costs are justified by outcomes. Some of the most expensive programs may be among the least effective and vice-versa.

Our research examines the effectiveness and costs of three different approaches to elementary teacher training in Sri Lanka: pre-service, conventional in-service, and distance in-service. It assesses the effectiveness of the various approaches as measured by teachers' theoretical knowledge, their actual classroom performance, and pupil achievement. It assesses costs from the point of view of both the sponsoring institution and the trainees.

The research data were collected in Sri Lanka between March 1988 and October 1989 from three different but comparable groups of teacher candidates at the entry, exit and post-program levels in their programs. An additional group of untrained teachers was also measured at the same post-program level (classroom teaching). Achievement tests were developed in knowledge and teaching skills in mathematics and mother tongue. An attitude questionnaire was developed as well. Teachers' achievement level was measured at the entry, exit, and post-program levels. A two-day classroom observation study measured teachers' classroom performance, use of teaching skills and resources,

Three Models to educate elementary teachers							
Program/Goal	Duration/Location	Entry Conditions	Content	Supervised Practice & Follow-up	Approaches to Training	Costs	M Scores 4th year students Math Science
TEACHERS' COLLEGES Experienced teachers; update skills and gain certification.	Full-time; 2-years course-work; optional residency; campus-based; In-service	Selection of successful senior teachers with either O/L ¹ or A/L ²	Emphasis on educational foundations, pedagogy, formation of cohorts	Included, but not a strong element	Teacher-centered; lecture format	High \$878 per trainee per year	35.4 44.5
COLLEGES OF EDUCATION Mold character and attitudes of young, well-qualified candidates. Offers diploma in education.	Full-time; campus-based; residential; 2 years course-work; 1 year internship; Pre-service	Young candidates with A/L	Innovative curriculum based on current research; co-curricular activities; subject matter emphasis; formation of cohort	Strong emphasis	Pupil-centered; experiential learning	Very High \$1,401 per trainee per year	35.2 43.4
DISTANCE EDUCATION To update teaching skills within existing teaching force Offers diploma.	In-service; field-based; 3-5 years coursework	Experienced teachers with either O/L or A/L	Emphasis on pedagogy and subject matter knowledge	Important component	Carefully designed self-instructional materials; "teaching while learning"; group activities; tutorial visits; peer relationships	Low \$251 per trainee per year	34.6 41.5

¹ OL = Ordinary Level of General Certification of Education

² AL = Advanced Level of General Certification of Education

and teacher-pupil interaction. Information about teaching practices was collected through a self-administered teacher questionnaire. This questionnaire included questions about the teachers' role in the school, their career path, support provided to them by the school, and their motivation. School support of teachers was measured by a questionnaire exploring the role of the principal, other sources of teacher support in the school, availability and use of resources, school status (i.e., whether a difficult or congenial school), and more general information about the school.

We also measured achievement for pupils being taught by the teacher training graduates in this study. Information about a program's history, philosophy, goals, and practices was obtained through interviews with program directors and faculty, as well as from documents provided by them. The institutional, private, and overall costs of the different approaches were also measured through interviews with program directors, questionnaires applied to trainees, and document analysis.

Findings

The Sri Lankan data point to four important findings:

- Teacher training changes what the teacher does in the classroom in a way that is positively correlated with pupil achievement.
- Any type of training is better than none at all.
- Trainees in the Colleges of Education are stronger both in subject matter and pedagogy than those in Teachers' Colleges.
- The Distance Education approach deserves attention because the costs are very low and it can maintain effectiveness at the post-program level.

Policy Implications

These findings have important implications for future policy on teacher educa-

tion as a vehicle to increase the quality of education in developing countries. The following features had a positive effect on program success:

- Clearly established standards/strategies for recruiting and selecting excellent qualified candidates to be trained.
- Use of updated knowledge and teaching techniques that research has proven effective in previous attempts to educate teachers and to teach children.
- Inclusion of a strong subject matter component in a balanced program allowing trainees a good understanding of what they are teaching as well as how to teach.
- Frequent interaction between what is being learned and what is applied in the classroom.
- Constant face to face interaction.
- Integration of the program's curriculum with the community where the teachers will work.
- Regarding the increase of pupil achievement levels, all teachers should receive at least some training.
- High levels of effectiveness per unit of expenditure.
- Financing arrangements in which a relatively high proportion of overall costs is borne by the trainees.

Affordable and sustainable systems that fill future needs for trained teachers could combine the best features of existing Colleges of Education pre-service and Distance Education in-service approaches. ❖

This article summarizes the results of a research collaboration conducted by the authors which is available as BRIDGES Research Report Series No. 10: "Comparing the Effects and Costs of Different Approaches for Educating Primary School Teachers: The Case of Sri Lanka," available from HIID.

Pupils taught by teachers trained in	Math	Mother Tongue
Teachers Colleges	35.4	44.5
Colleges of Education	35.2	43.4
Distance Education	34.6	41.5
Untrained Teachers	29.6	34.8

What Works Best?

Colleges of Education approach works best:

- where the purpose is to train few but excellent teachers;
- where there are highly qualified recruits and available resources;
- where training large numbers of teachers is not urgent;
- where the purpose is to strengthen the effects of teacher training once graduates are teaching; and
- when support is provided through a third year internship.

Teachers' Colleges approach works best:

- where training large numbers of teachers is not urgent;
- to update teachers' knowledge and skills;
- to motivate teachers for long years of service; and
- where there are resources available for selected groups of teachers.

Distance Education approach works best:

- where large numbers of unqualified teachers need to be trained at low cost;
- when the purpose is to do "on-the-job" training;
- when program materials are used in conjunction with tutorial visits; and
- when there is constant face-to-face interaction among tutors and trainees. ❖

Teacher Training/Teacher Content Knowledge Study

by Ellen van Kalmthout and Barbara O'Grady

Two provinces of Pakistan—Balochistan and the Northwest Frontier Province (NWFP)—are addressing educational access and quality issues through multiple teacher training approaches. The training is particularly directed toward increasing the supply of female teachers, a prerequisite in many instances for educating girls. At the same time, Pakistan is assessing what teachers know and what effective teachers need to know, in order to adjust the content of future teacher training programs. The primary directorates of education in Balochistan and NWFP are being assisted in both the training and the research by the Primary Education Development (PED) Program.

Accelerated Equivalency Program

The accelerated equivalency program, also known as the “crash” program, provides for two three-month training cycles per year, eventually reaching 8,000 untrained working primary teachers and resulting in an equivalency certificate. The program is offered during school holiday periods when extremes of heat or cold prevent teachers and children from attending school. Teachers, nonetheless, have willingly attended the training sessions.

Mobile Teacher Training Unit

Using the curriculum of the “crash” program, the mobile teacher training unit takes training to rural females who have no other alternative for certification. It offers training at centers within walking distance or a short bus ride from the teachers’ residences, thus eliminating concerns related to travel or overnight stays by women.

Master Trainers

A master trainers approach to introducing new curriculum materials has evolved from a conventional program in which one group of trainers travels from district to district to train assistant district education officers, learning coordinators, and teachers. In the future, those who excel will receive training as a group at a central location and will themselves return to the districts to continue the process, replac-

ing the traveling group of trainers.

Much time in teacher training courses is devoted to teaching subject content although it is unclear if such training improves the content knowledge required of teachers at the primary level. A BRIDGES study of 500 schools found higher achievement scores among students of class 4 and 5 in math and science whose teachers had completed longer periods of academic training. Professional teacher training, however, made no difference in achievement scores of students. A question arising from this research is whether longer academic training adds to the content knowledge of teachers, thereby making them better teachers. A second question asks if experienced teachers over time absorb subject content as they teach their classes, using primary school textbooks as one means of instruction. A PED study asked the questions in order to determine what specific additional training is needed.

The PED study aimed at assessing the knowledge of subject content taught in class 5 of primary school of Primary Teaching Certificate (PTC) students studying in Government Colleges for Elementary Teachers (GCETs), and inservice teachers. Specifically, the objectives were:

- To assess the strengths and weaknesses in class 5 content knowledge in math, science, and Urdu of teaching candidates entering PTC training in GCETs;
- To assess the extent to which the present PTC training in GCETs provides teachers with class 5 subject content knowledge in math, science and Urdu;
- To test whether candidates to GCETs with higher academic qualifications perform better on class 5 achievement tests than those with lower qualification; and
- To assess the strengths and weaknesses in the class 5 subject content knowledge in math, science, and Urdu of working teachers with varying years of experience.

Approximately 900 students in six GCETs were tested with the curriculum-based

achievement tests in math, science, and Urdu, developed by the World Bank Primary Education Project II. Tests were administered at both the beginning and end of the course. Six hundred primary teachers from a representative sample of 184 primary schools at six sites were also tested.

Conclusions

Preservice (PTC) Students:

- PTC students at the beginning of their training obtained low results on the math and science tests. The average for Urdu was much higher, although still short of full mastery.
- PTC training did not have a major effect on students’ class 5 content knowledge. PTC students are ill-prepared to teach math and science in particular.
- Only a relatively small percentage of PTC students obtained a fairly high score in math. Most scored in the middle range and would probably need substantial review of class 5 math material.
- PTC training made no difference for performance on the science test. Only 10% obtained a reasonably high score. Most scored in the middle range.
- The average content knowledge of teacher trainees in Urdu is reasonably good. The PTC training may have made a small difference for performance on the Urdu test, although results were high before the training.

The level of academic qualifications proved to be a good predictor for achievement on tests of all three subjects. Achievement increased with increased years of academic schooling for all subjects. Academic background made the largest difference for math.

The differences at the beginning of the PTC course of student bodies in different training colleges are larger than those at the end of the course. However, no single college managed to bring a significant proportion of students to average levels of content knowledge in math or science.

Pakistan continued on page 15

Knowing the Limits of What We Know

by *Fernando Reimers*

The existing evidence on the contributions of teacher training to the quality of education is mixed. A recent report by UNESCO says "some researchers, mainly in North America and Europe, have questioned whether teachers really make a difference in students' learning". A review of studies discussing the investments which influence learning in developing countries found mixed evidence on the role of teacher education. Out of 25 studies examining the role of teacher's schooling 14 found negative or no effects; out of 30 studies examining the role of teacher training 9 found negative or no effects; out of 5 examining the role of in-service teacher training, 1 found negative or no effects.

Research on the quality of education carried out over the last few years in project BRIDGES has produced paradoxical findings. In a national random survey of primary schools in Pakistan the certification of 1000 teachers showed no impact on the achievement of students in classes 4 and 5 in mathematics and science. Similarly, in a study on the factors that promote learning in rural schools in Honduras the training of 64 teachers showed no impact on the reading ability of students in classes 1 and 3. In Pakistan training for primary school teachers is given in a one year course, the Primary Teaching Certificate (PTC). In Honduras primary school teachers are trained in 'Normal' schools and Universities. The research we carried out shows that the students of teachers with a PTC perform the same on tests as those of teachers without a PTC. In Honduras, students of teachers who have attended 'Normal' training institutions or universities have the same reading ability as teachers who have not received this training.

The paradox is that while certification of teachers shows no impact on student learning, a substantial amount of that learning is the result of differences between classrooms. Using techniques of hierarchical analysis (which allow one to specify how much of the differences in student achievement can be accounted for by differences between students and how much can be

accounted for by differences between the classrooms they attend) we found that differences between classrooms accounted for 50% of student achievement in Pakistan and for 30% in Honduras. These findings suggest that what happens in the classrooms is an important factor in whether students learn or not. In fact, the role of classrooms and schools in these studies is larger than that found in the United States, where differences in the social background of the students have been found to account for 82% of the differences in student achievement.

If what happens in classrooms is largely determined by the actions of the teacher, and if teachers can learn to teach in more effective ways, then it is clear that teacher education should continue to be an important policy option to improve the quality of education. How then, can we reconcile that conclusion with the studies that show no effect from teacher training?

I contend that one reason why teacher training shows little or no effect in many studies is because most teachers are already trained. Those who are still untrained are very experienced and therefore do not provide a good sample on which to decide to cut back on the training requirements of teachers.

The BRIDGES findings in Pakistan suggest that the type of professional training currently available in the country has no impact on student achievement. Furthermore, to qualify the finding, it is important to highlight that only 15% of the teachers in Pakistan are untrained. In Honduras only 34% of the teachers were untrained.

Countries should try to optimize the mix



Fernando Reimers and Dr. Nasim Qaisrani discuss a study on the influence of general and professional education and achievement of teachers in academic achievement of primary school students during a BRIDGES training workshop in Pakistan.

between general education, pre-service training and in-service training. Different types of research can inform those policy choices. Findings from survey research should be contextualized to the type of teacher training existing in the particular country studied, and to the existing balance of trained versus untrained teachers. In a sense the findings are a useful account of the role of teacher training in a static view of the world. But where the objective is innovation and change, other evaluation and experimentation research methods might be necessary to document the contributions of teacher training and of different training modalities. ❖

Fernando Reimers is a Research Associate at HIID. He is the author of "The Impact of Economic Stabilization and Adjustment on Education in Latin America" Comparative Education Review 35(2):319-353, and coauthor of "Teacher Training in Pakistan: Value Added or Money Wasted?" and "Why Do Children Repeat Grades? A Study of Rural Primary Schools in Honduras" available through Project BRIDGES.

Teacher Learning: An Agenda for Research to Improve Teacher Training

by Mary M. Kennedy

The National Center for Research on Teacher Learning is charting a new area of research to improve teacher training.

The history of education is a history of reform efforts, most of which have left teaching almost unchanged. One reason for this is that, despite the growth in school bureaucracy, teaching is still a highly decentralized enterprise. Individual teachers are still largely responsible for what happens to children. New ideas are accepted, rejected, or modified by individual teachers working in their own classrooms. Progress and change depend on what teachers, working in relative isolation, know and are able to do in their own classrooms. Reform, then, is heavily dependent on teacher learning.

Teacher learning is an unusual field for research because it is situated at the intersection of several fields of research and practice: research and theory on learning, on teaching practice, on the relationship between education and society, and on the nature of school subject matter. One problem of previous research on learning to teach is that it often ignored many of these connections.

Four Elements Included in Teacher Learning Research

Located at Michigan State University, the National Center for Research on Teacher Learning is charting a new area of research which has significant implications for teacher training. The new center for research on teacher learning defines its terrain to: (1) accommodate *public expectations* for schools, (2) incorporate a theory of the *teacher as a learner*, (3) incorporate a theory of the *teacher's task*, and (4) a theory of the *unique features of teaching practice*.

1. Public Expectations for Schools

Research on teacher learning must situate itself in the context of public expectations for schools. Teachers are facing numerous demands reflecting changes in the workplace, changes in expectations for learning in the academic subjects, changes in na-

tional and international politics, and changes in the composition of the student body. Reform demands add to the already difficult nature of teaching by requiring that academic tasks be rendered more true to the discipline, that they require more reasoning and understanding from students, that they connect subject matter to other aspects of life, and that they incorporate more and more diverse students.

...if research on teacher learning enables all teachers to be only as good as typical teachers now are, it will not have advanced practice...

All of this suggests that a center for research on teacher learning cannot be satisfied with efforts to help teachers learn to be as good as typical teachers of today, but must, in addition, consider other new demands which will increase the complexity of the practice of teaching. This has significant implications for research on teacher learning, for much of it is based on the premise that the central questions of teacher learning have to do with helping novice teachers, or relatively less-proficient teachers, become as good as most teachers are. That is, it uses current practice to establish the norm for teacher learning. But if research on teacher learning enables all teachers to be only as good as typical teachers now are, it will not have advanced practice in ways that accommodate public expectations.

2. Teacher Learning

For centuries, pedagogues have assumed that learning consisted mainly of the passive accumulation of new knowledge: students learned by listening to lectures or reading texts, and their progress was measured by their ability to recite back what they had heard or read. But research in the past two decades has made it clear that learning occurs through an active process of interaction between the learner and an experience. Learners impose meaning on the basis of their prior knowledge. This implies not only that a given experience may be interpreted by different people to mean different things, but also that people differ in the kind of experiences from which they learn.

This new understanding of learning has stimulated a great deal of interest in how teaching practices might be altered to better promote student learning. Many researchers are altering their ideas about how students in school learn. But the findings from cognitive science apply equally well to teachers. We can no longer assume that teacher learning occurs solely through receiving new knowledge. Teachers, like other learners, interpret new content through their existing understandings and modify and reinterpret new ideas on the basis of what they already know or believe.

To understand how teachers learn to teach, therefore, we need to extend findings about learning from students-as-learners to teachers-as-learners. We need to define teacher learning as a function both of the teacher-learner and of the learning experience itself. We must design research that examines both what teachers bring with them to new experiences—what they already know, believe, or value—and the experiences themselves—the features that are likely to promote learning the new

Teacher Learning continued on page 10



Beyond the Three R's: Developing All Seven Forms of Intelligence.

by Thomas Armstrong

Teacher training institutions all over the world teach teachers to teach passively through lecture format. New information from neuroscience research shows that this approach is not effective for many people. Educators in search of new ways to make schools better serve students' needs can find inspiration in Howard Gardner's theory of multiple intelligences. Gardner, a psychologist and co-director of the Harvard Project on Human Potential, is author of *Frames of Mind* (Basic Books, 1983). In this book, he suggests that our concept of intelligence—fashioned from years of experience with IQ testing—is far too limited.

Gardner's work shows that we possess not one but seven distinct forms of intelligence: linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, and intrapersonal. This theory is backed by the most current research in neuropsychology, psychological testing, developmental work with young children, cross-cultural studies, and biographical accounts of exceptional ability among scientists, artists, musicians, and individuals skilled in many other fields.

Gardner argues that schools seem to reinforce linguistic and logical-mathemati-

cal forms of intelligence while neglecting other ways of knowing. Teachers love children who are good with words and logic. Children who show ability in dance, art, music, social relations, intuition, drama, and other areas of self-expression tend not to receive as much recognition.

Gardner's model of the seven intelligences provides a solidly grounded structure that can be used in designing a dynamic learning environment. Because each person possesses all seven kinds of intelligence, a truly integrated curriculum can be developed to address every intelligence in a balanced way. And because each individual has a personal learning style emphasizing certain intelligences over others, teachers also need to be sensitive to the diverse ways that people learn and give them methods and approaches tailored to their own unique styles.

Here are some examples of educational tools that can meet a broad range of learning abilities:

- *Linguistic intelligence:* Storytelling, books, printing sets, writing materials, discussions, debates, and public speaking.
- *Logical-mathematical intelligence:*

Strategy games, logic puzzles, science kits, detective games, nature equipment.

- *Spatial intelligence:* diagrams, charts, maps, visualization activities.
- *Bodily-kinesthetic intelligence:* Playgrounds, hiking, obstacle courses, wood-carving, sand drawing, modeling clay or mud, carpentry, costumes for drama.
- *Musical intelligence:* Musical instruments, the human voice, the sounds of nature, and things to strum, tap, pluck and blow into.
- *Interpersonal intelligence:* social events, cooperative learning, group games, discussions, group projects, simulations, competitive and non-competitive sports, and peer teaching.
- *Intrapersonal intelligence:* Self-paced instruction, individualized projects, solo games and sports, forts, tree houses, lofts and other spaces to retreat to, diaries and journals, meditation and self esteem activities. ♦

For further information, please write the Harvard Project on Human Potential, Harvard Graduate School of Education, Longfellow Hall, Cambridge, MA 02138, USA.

ideas or practices offered to them. Such a shift constitutes an important new direction for research on teacher learning.

3. Teachers' Task

The central task of teaching is connecting diverse learners to important subject matter knowledge. Recent findings from cognitive science offer a new avenue for trying to learn more about connecting subject matter to students. Although the nature of subject matter understanding varies from one subject to another, cognitive researchers now recognize some common features of "understanding" that cut across subjects. Three important features are the *connectedness* among ideas within the subject, *flexibility* in using subject matter knowledge, and perceived *meaningfulness* of the knowledge.

Connectedness. Knowledge is more easily accessible when it is connected to other knowledge by means of multiple webs or networks of meaning. The extent to which a given idea is embedded within larger networks of knowledge will influence when and how that idea can be recalled and used. For example, facts learned in isolation from other knowledge will be difficult to access when they are needed.

Flexibility. Among the many connections teachers and students need to make as they learn school subjects are those between substantive ideas and a variety of life situations. Connecting subject matter knowledge to multiple contexts gives the knower flexibility to perform many intellectual tasks with the knowledge, rather than yoking knowledge to discrete, limited problems or situations. Flexibility is particularly important for teachers, not only as a matter of understanding the subject, but also as a matter of finding multiple ways to represent the subject to diverse learners.

Perceived meaningfulness. Finally, subject matter knowledge that is connected and flexible is more likely to enable teacher-learners to perceive meaning in the content. It enables the learner to see history, literature, the arts, and the natural and social sciences not as arcane bodies of disconnected facts of limited use but as important and meaningful bodies of

Four Cs of Research on Teacher Learning

Context: Public Expectations for change

We concentrate our work on how teachers can learn to teach in more powerful and demanding ways than teachers have been asked to teach in the past.

Comprehension: Teachers as learners

We ask how teachers can transform the understandings they bring with them into better ways of understanding teaching.

Connectedness: Teacher's task of connecting subject matter to diverse learners

We ask what teachers need to learn about both subject matter and learners, and how they learn about both.

Complexity: Unique features of teaching practice

We ask how teachers can learn both the intellectual and the logistical aspects of managing ambiguous, dynamic and complex learning environments.

knowledge that can help them understand and appreciate their place among human beings and to appreciate the workings of the natural and social worlds.

4. The Unique Features of Teaching Practice

Teaching requires a careful balancing of multiple concerns—about subject matter, about diverse learners, about the teacher's role in facilitating learning—and it requires the capacity to reason about these concerns in the dynamic context of particular situations. The unique nature of teaching practice presents two special problems for the teacher-learner. On one side, the concepts and criteria teachers need in order to manage learning tasks intellectually are highly indexical: They refer to teacher, student, or classroom activities and consequently cannot be understood outside the context of practice. In the past, researchers and teacher educators have assumed that teachers needed to learn such concepts before they learned to apply them to their practice. However, more recent work suggests that, because these concepts are indexical, their meaning cannot be understood outside the context to which they refer. So when teacher-learners take such courses as Educational Psychology or Methods for Teaching Mathematics and learn such concepts as "wait time" or "metacognition," they are unlikely to understand how these terms bear on their practice. Since many of the most important concepts and criteria teachers need to learn are indexing terms, it follows that teachers should learn these ideas in the context of practice.

Conditions That Facilitate the Management of Complex Learning Activities

The dilemma of how to help teachers grasp important yet indexical concepts and criteria is apparent. Studies of efforts to teach teachers specific skills often conclude that teachers cannot learn these skills without also learning the associated concept, while studies of efforts to teach teachers concepts often conclude that teachers cannot grasp these concepts in the absence of concrete experiences.

One strategy for resolving this dilemma is to devise simulations of teaching that enable teachers to freeze the frame—to stop the action for a moment so that they have time to digest everything that is happening and to formulate a more sophisticated interpretation of it. The use of case studies in teacher education, for instance, offers such an opportunity, for novices can examine a case study at leisure, can interpret and reinterpret its sequence, can consider alternative hypotheses that could account for the observed events. Case studies can be useful devices both for situating the meaning of relevant concepts and criteria and for giving teachers practice in slow-motion pedagogical reasoning. If they provide these opportunities to teacher-learners, case studies can help teachers learn to manage, at least intellectually, classroom learning activities.

Still, case studies by themselves are unlikely to further teachers' intellectual management of academic tasks. To succeed,

they must be accompanied by something or someone who prompts the teacher-learners to construct a situated understanding of relevant concepts and criteria and who coaches them in their reasoning about the relative merits and trade-offs among these criteria. One role for mentors, then, might be to point out specific examples of relevant concepts, so that teachers can begin building a database of examples of the concept. Another role would be to raise questions when a teacher-learner seems satisfied simply because a lesson went smoothly, because children seemed interested, or because children were well behaved.

The process of learning to teach is a difficult one. Teachers must, on one hand, learn valid concepts and criteria for choosing and evaluating learning tasks, and these concepts and criteria can only be understood in the context of teaching situations. On the other hand, these very situations are so complex and dynamic that they can inhibit attention to the very things teachers must learn. The principal hypotheses that guide our research on how teachers learn to manage complex learning activities are:

The intellectual management of learning tasks requires situated understanding of relevant concepts and criteria

Learning to manage complex learning activities, both intellectually and logistically, requires at least the following conditions:

- Opportunities to stop the action so that slower and more detailed deliberation is possible,
- Opportunities to see explicit connections between relevant concepts and criteria and teaching situations, and
- Opportunities to see connections between relevant concepts and criteria and teachers' own behaviors. ❖

Mary M. Kennedy is Director of the National Center for Research on Teacher Learning at Michigan State University. For a copy of the complete manuscript, please write to her at the College of Education, 116 Erickson Hall, East Lansing, MI 48824-1034 USA.

Increasing Access to In-Service Teacher Training

The multiplier-effect format is an effective approach to train primary school teachers

In Swaziland, a formal inservice training program for 240 educational personnel resulted in training to over 320 schools and 3,200 teachers. This training, which covered all four areas of the primary school curriculum, was provided in two 2-year phases.

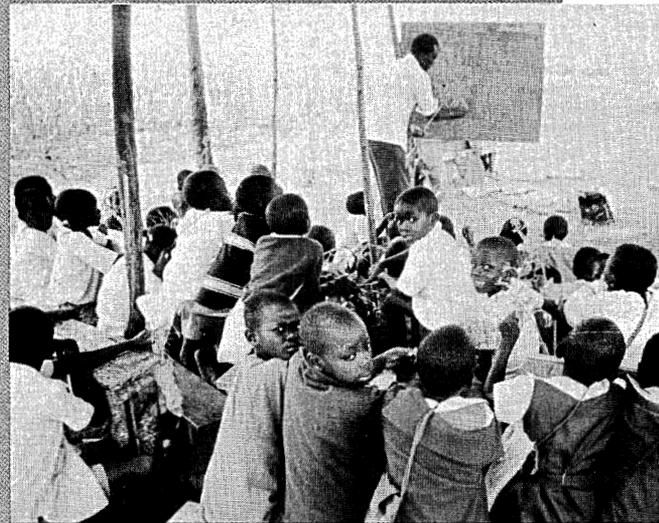
The multiplier-effect format was planned as follows:

- Ten Inspectors and/or Headmasters were selected from each of Swaziland's four regions to serve as District Inservice Education Specialists (DIESs)
 - The DIESs, in turn, selected 20 target schools in their region. From each target school one of the best teachers was selected to be a Local Inservice Teacher (LIT). Each DIES had 2 LITs.
 - These 40 DIESs and 80 LITs comprised the first cycle of the inservice education cadre.
 - The 80 LITs selected a sister school with whom they worked during the two-year program of inservice education. Twenty target schools and 20 sister schools from each of the four regions made up the 160 schools for the first phase of the program.
- Each phase was divided into four 6-month training cycles. DIESs and LITs began each cycle by attending a two-week residential workshop on one of the key curriculum areas. Following the workshop, DIESs and LITs returned to their target and sister schools and conducted spin-off workshops. At various intervals after the initial training, DIESs and LITs completed one-day workshops in the same curriculum area and then held follow-up workshops for their target and sister schools.

At the end of Phase I, new DIESs and LITs were selected and the entire process was repeated for a new set of 160 schools.

The training was very successful, and the program was enthusiastically received. The

training made a rapid impact on the primary education system by bringing teachers up to date on new curriculum and new and better teaching methods. By the end of the first six months of the program, evidence in the form of charts, bulletin boards,



teaching aids, etc. could be found in classrooms in well over half of the primary schools in the country.

In addition, more training was provided than originally planned. Spin-off training sessions were attended by more teachers than intended. Also, in response to participant requests, DIESs and LITs attended monthly and training sessions at regional teacher centers that had been set up under the project to provide upgrading activities.

When increased primary school test scores were shown, the Ministry of Education established a new Department of Inservice Education at the end of the project. The cadre of 240 DIESs and LITs has become a resource for curriculum workshops and is helping to introduce new teaching methods and curriculum materials. ❖

Source: Lessons Learned in Basic Education in the Developing World, U.S.A.I.D Office of Education, Bureau for Science and Technology, Washington, D.C. (1990)

Inservice Training Programs for Novice Teachers in China: A Conversation with Yu Yi

Liping Ma

What is the sound of one hand clapping? Without revelation of the wisdom of teachers, the genius of educational theory in teacher training will be the single hand that is never able to clap.

In China formal teacher education constitutes only half of teacher preparation. The other half has to be accomplished on the job with the active support and involvement of the teacher community. Novice teachers educated in specialized institutions of formal teacher education—the normal school (high-school level) receive inservice on-the-job induction through apprenticeship.

This interview introduces thoughts and wisdom of an exemplary teacher. This is important because most educational journals and academic works are written by, and for, researchers and scholars rather than practitioners such as teachers. The style, language, and topics of writings of educational research have closed the door to the intelligence and wisdom of teachers.

Yu Yi taught school for over 40 years in Shanghai. In my first meeting with Yu Yi, she described the on-the-job induction program of her school. I found some latent connections between Yu Yi's views and the U.S. theoretical insights in teacher education, such as Dewey's idea of teacher education as laboratory versus apprenticeship and Schon's thought of "educating the reflective practitioner." This interview contains some of her thoughts on the on-the-job induction program and reactions to these American scholars.

Officially Qualified Doesn't Mean Practically Qualified

M: As I understand, the three components [of the inservice on-the-job induction program] represent different levels of communication. First, in the pairing of the master teacher with an apprentice, the beginning teachers mainly communicate and interact with their master. Second, in the teaching research group, they have contacts with the group of teachers teaching the same subject matter. On the third level, in the annual award nomination, new teachers communicate and interact with the

entire teacher community in the school: with other new teachers as well as other experienced teachers. On all the three levels, new teachers, as well as experienced teachers, work on how to improve teaching quality.

Y: Yes, after five years, we find that many apprentices excel their masters and they have developed the habit of self-improvement in teaching. At that point, we feel that we can say that the process of teacher preparation has been accomplished.

M: Do you mean that the teacher preparation process is not really accomplished in teacher education programs in universities?

Y: It is not a secret that formal teacher education can't provide practically (not officially) qualified teachers. When new teachers begin their career, in most cases, neither the school nor themselves are satisfied. For new teachers, they usually feel that everything in the classroom is so "messy" that what they learned in educational courses does not help at all. In the meantime the teacher community is not satisfied with the work of these new members either. ...In order to let new teachers know practically what a good teacher should do, why, and how, our program has a threefold purpose.

M: What do you mean by a threefold purpose? Can you describe them one by one?

Y: First of all, we let new teachers know the value of the teaching career, the calling of teaching, through concrete samples of great teachers. What is good teaching? What is a good teacher? ... There is a basic value of teaching which does not change through time, nor across cultures. This imagination is contained in the career of great teachers over the world.

We can make a long list of these great teachers. From the great ancient Chinese teacher Confucius to the great ancient Western teacher Socrates, from the Czechoslovakian educator Johann Comenius to the Italian educator Maria Montessori, from the Russian educator Anton S. Makarenko to the American educator John Dewey, etc.—they all are great teachers and educators recognized in the field.

We have our new teachers read and learn about a few great internationally recognized teachers and educators. We believe that once they are touched and moved by the career of these great teachers and educators, especially when they are facing their own students in the school, they will have an idea of what a good teacher is in their mind. . . . In addition, good teachers in our school or schools nearby are also real examples of good teaching for our new teachers. We encourage new teachers to have personal contact with them, to get to know them.

M: So, first of all, you have beginners perceive the basic value of the vocation of teaching through life stories of great teachers.

Y: Yes, secondly, we want our beginning teachers to know what are the necessary dispositions for being a good teacher. ...I usually tell new teachers that the most important disposition of a good teacher is to keep on pursuing new learning and improving yourself. In China teaching is a lifelong career. This career is like a long-distance race, not a short-distance race. Teachers need "sustaining power" for their continuing development. What we pursue is "the delayed effect" or "sustaining power." ... I believe that a teacher who knows what a good teacher is and has the disposition of learning unceasingly will spontaneously know what he or she should learn.

M: What you said reminds me of the idea Dewey proposed in his article "The Relation of Theory and Practice in Education." He said that unless a teacher continues to be a student, a student of subject-matter and a student of mind-activ-

ity, [s]he can't grow as a teacher, an inspirer and director of soul-life.

Y: It is absolutely true. A good teacher should always be a good student, a good student of teaching.

M: You said that you have a third purpose to your program.

Y: The third purpose is to develop particular skills and teaching routines. It includes how to plan a class, how to write class notes, how to arrange teaching materials, how to correct students' works, how to design a test, how to grade students, etc. At the start, beginners are required to follow their masters, but they are open to make changes and improvements later on according to their own idea.

Communication With the Community is the Moment for Reflection

M: You have argued that beginning teachers have to learn teaching while at work, but ... don't you think that all beginning teachers have been exposed to teaching for many years?

Y: It is true that every educated person has been exposed to teaching practice for decades. But it is definitely different observing teaching practice as a student, as a student teacher, and as a beginning teacher. They look for different things, so they see, in fact, different things. ...We regard the observation of teaching as one moment for reflection and communication within the teacher community. Being observed by a mentor or by another teacher is another moment that will stimulate interaction between new teachers and the teacher community, too.

M: Donald Schon, who regards teachers as "reflective practitioners," proposed the idea of dialogue between the "coach" and the student teacher. He assumes that a dialogue that will educate a reflective practitioner should have three essential features: (1) it takes place in the context of the student's *doing*; (2) it makes use of actions as well as words; and (3) it depends on reciprocal reflection. He claims that professional education should be redesigned to combine the teaching of applied science with coaching in the artistry of reflection-in-action. For him, the process of inquiry is a trilogy: knowing-in-action, reflection-in-action, and reflection on reflection-in-action.

Y: I think Schon is right. The three features

are relevant. I especially appreciate the phrase "reciprocal reflection." In fact, mutual communication provides the opportunity and condition needed to facilitate reflection in depth. In other words, when you allow new teachers to survive on their own, reflection based on communication is lacking. In our program, the demonstration and reciprocal reflection are not limited within the master-apprentice pair. It is more extensive. In the teaching research group, novices have dialogues with other members of the group. For the annual new teacher award nomination, they communicate with other novices and other teachers in the entire school.

A Short Conclusion

It seems to be a bit strange to discuss big theoretical debates with a classroom teacher. It seems to be even more strange to discuss

these American debates with a Chinese teacher. However, my conversation with Yu Yi shows that a teacher is not just a passive receptor and executor of theory, as many of us in the research field assume, but a critical discussant and an active contributor of theory. A teacher's understanding of theoretical issues even surmounts cultural differences. Without the revelation of the wisdom of teachers, the genius of educational theory will be the single hand that is never able to clap. ❖

Liping Ma, graduate student at the School of Education, Stanford University, is a research assistant with the National Center for Research on Teacher Learning (NCRTL). For a complete copy of the interview, please write NCRTL, 116 Erickson Hall, Michigan State University, East Lansing, Michigan 48824-1034.

Effective Teacher Training

Successful teacher training can be accomplished in a workshop setting emphasizing hands-on experiences and transfer of practical skills for classroom use, rather than formal lectures.

In Haiti, where many private sector primary school teachers lack basic competencies in both academic subject content and pedagogy, lectures delivered by subject specialists at a theoretical level have not proved successful in improving teachers' skills. Training that links concepts with tangible outcomes has been much more effective.

The cornerstone for Haiti's primary school teacher training is hands-on practice. Training is based on a workshop format that combines basic academic concepts with pedagogy. Teachers are introduced to the academic subject through the construction of teaching materials that can be used in the classroom. Presentation of basic concepts follow, using the fabricated teaching aids. Finally, the group develops appropriate teaching objectives and designs lesson plans based on what they have learned.

This approach is necessarily highly interactive and participatory. Teachers appear more comfortable learning in a group, rather than having individual responsibility for assimilating the material. The resultant teaching materials and lesson



Noel McGinn

plans are immediately put to use in a classroom setting, during practice teaching sessions with school children invited to participate. Teachers are videotaped and their performance is critiqued. (This, in turn, introduces the concept of self-evaluation, which in theoretical presentations to teachers generally meets with resistance.) In essence, the teachers live through the actual subject matter, and academic skills are reinforced by practical ones. The development of teaching materials seems to have a particularly high motivational impact, and teachers express pride in their work. ❖

Source: Lessons Learned in Basic Education in the Developing World, U.S.A.I.D., Office of Education, Bureau for Science and Technology, Washington, D.C. (1990)

Promoting the Recruitment and Training of Women Teachers



In all sociocultural settings, the recruitment of female teachers enhances girls' enrollment. It is difficult to establish causality between female teachers and female enrollment, but international cross-sectional data suggest positive correlation between enrollment parity (girls per 100 boys) and the proportion of female teachers. This association is not weakened even when data are truncated by regions or limited to comparable income levels, suggesting the importance of female teachers in all sociocultural settings.

Shortage of women teachers in rural areas

The same cultural constraints that require girls to be taught by women often make it difficult to attract women to rural teaching posts. The shortage of female teachers is much greater in rural areas. Some countries—for example, Morocco, Somalia, and Yemen—have a surplus of both male and female teachers in urban areas, but an acute shortage in rural areas. As a first step toward eliminating these gaps, it makes sense to ensure that the salary system for teachers is not biased against rural posting. In Cameroon, for example, teachers are given a special bonus for rural posting. To increase the proportion of female teachers substantially, especially in rural areas, innovative recruitment and teacher training policies may also be needed.

Policies tried by various countries include setting targets for women's recruitment, focusing recruitment of rural teachers on women from local areas who are willing to serve there, and providing teachers with housing and transportation. Simply providing housing may not be enough, as experience in Pakistan has shown. In Nepal, a more comprehensive approach has worked: it offered home-posting for women teachers, lowered entry requirements for some rural girls, subsidized their secondary education, and supported girls through conventional teacher training with a monthly stipend, travel expenses, medical care, and tutoring. Community involvement was important: an intensive community awareness campaign preceded the teacher training program in Nepal. The number of female teachers increased and after that female school enrollments improved. In Yemen, teacher training has been the principal policy to increase

female enrollments over the last 15 years, and the government is considering maternity and long-leave policies for female teachers to allow easy re-entry. In Pakistan's Balochistan province, providing buses for female teachers proved a practical way to transport them to distant schools.

In-Service Training Eases Formal Education Requirements

It is possible to find good female teachers to serve rural areas by easing formal educational requirements, providing training, and posting women teachers near their homes. Women may be hired as assistant teachers, with less formal qualifications for teaching but more aptitude and motivation. Teachers with lower formal qualifications may be restricted to teaching the lower primary grades, but in-service teacher training can give them a chance to upgrade their skills. In Pakistan a World Bank project contains a component for in-service training of less qualified teachers; 15,000 of the 17,500 teachers to be trained under the project are women. Research indicates that teachers' knowledge of subject matter is more important to children's learning than formal qualifications or experience, which are the traditional quality indicators. Thus, the combination of motivated female assistant teachers (who have a stake in the village where they are settled) and active in-service training and supervision can provide a suitable solution to the shortage of female teachers in some rural areas.

Local-School, Local-Teacher

Measures to promote recruitment of and training for female teachers may carry more additional costs than similar efforts for male teachers. On the other hand, salary savings may be achieved through greater use of assistant teachers. Reduced absenteeism and greater commitment from locally hired teachers may also enhance cost-effectiveness. Using a network of many local assistant teachers may accentuate the issues of administration and supervision associated with decentralization which arises in a system of many small schools. Yet top-down management has often proved problematic, and the local-school, local-teacher option can be more conducive to effective local management. ❖

From South to North: A Note on Forming a Community Based Literacy Program

by Mary Ng

A teacher applies lessons learned in the Philippines to start a new program in the U.S.A.

In March of 1992 while administering a standard assessment tool to a group of women for an educational program on the Pascua Yaqui Reservation, it immediately became apparent that two of the women were having difficulty reading the test material. I knew I had placed the women in an awkward and embarrassing position. When I met separately with the women, we cried as they explained they could not read. After returning from twenty years of living in the Philippines, I now met Americans, ironically, I had only read about: Americans who had been passed through the public school system but who could not read.

The Pascua Yaqui nation was recognized by the U.S. Congress in 1978 and has about 6,000 members. On the reservation, which is located just southwest of Tucson, Arizona, 60 percent of the people are unemployed.

Although adult literacy programs are available off the reservation, the women were too shy and ashamed to attend these classes initially. They had been ostracized for being "Indian" in their youth. It takes a great deal of courage in the first place to admit one is a non-reader. And so, we, the two women and I, decided to begin a literacy program with the idea from the start that they would become literacy teachers in the community and that we would teach each other. As a newcomer to the reservation, I had much to learn. We could build on the experiential teaching skills of the women as I learned and as they learned. In addition, the women would be able to read to and to teach their children literacy skills. As the women developed self-confidence (when they were "ready"), they would also attend a computer-assisted literacy program in town.

I could apply knowledge learned during my work with the Smokey Mountain Sabana while living in Manila (see *The Forum* Vol 1, No. 4), to this new project. I realized the importance of forming a small community-based staff of teachers who would know the specific needs of the community. We started by developing

some of our own material as well as using New Readers' Press (Laubach) material, Litstart and the local newspapers. We made a field trip to the branch library and planned to work with the children's librarian to form a section of children's books which new adult readers would be able to read to their children. We checked out books on zoo animals and became familiar with the names. When we took a field trip to the zoo, the women were able to read the name markers to their children.

We are also connecting with other tribal offices and services, including the Head Start program. This June, the women participated in the tribal elections for the first time. As their reading skills have improved, so has their self-esteem. They are now attending other tribal meetings and they are able to read the tribal newsletters. We hope to produce material sensitive to Yaqui culture on basic literacy and numeracy for the reservation cable channel and then follow this up with material in the tribal newsletter. In exchange, I am learning about traditional Yaqui beliefs, customs, and cooking. We have written to the National Center for Family Literacy and we hope to network with other Native American literacy programs.

Still, it takes time to learn and sometimes we are discouraged. And we still have to fight old mind-sets. When one of the women was asked to read a poem last week, she threw her hands up in the air and said, "I can't read!" Surprising herself (but not me), she did read the poem and knew all the words but two. The glow of achievement that spread over her face as she realized she was, indeed, reading was truly wonderful. ❖

Mary Ng has been involved in alternative education for most of her adult life. For further information about this program, or if you want to offer comments or curriculum materials or support, write to: Mary Ng, Pascua Yaqui Tribe of Arizona, c/o Social Services, 7474 South Camino De Oeste, Tucson, AZ, USA.

Pakistan continued from page 6

On average, female students scored about the same as male students on science and Urdu. Male students obtained a better average on math.

Inservice Teachers:

Inservice teachers obtained low results on the math and science tests. For Urdu the average is much higher, but a large proportion of the teachers have not mastered class 5 Urdu content fully.

The most serious weakness in teachers' content knowledge is in math. Only a relatively small percentage of primary teachers obtained fairly high scores. More than half scored in the middle range. About one-third scored lower than 50%.

There are serious weaknesses in class 5 science knowledge. Only about 10% of the students obtained a fairly high score. Most scored in the middle range.

The Urdu content knowledge seemed reasonably good, although a sizable group did not achieve a high enough score for mastery.

Length of service makes a difference for math and science but not for Urdu. Teachers who have taught class 5 score better on math and science than those who have not taught it. However, differences are too small to be meaningful.

Teachers' achievement increased with their years of academic schooling for math and science but not for Urdu.

Inservice teachers had approximately the same scores as PTC students on the posttest in different knowledge/skill areas, suggesting that primary teachers have not learned any specific content areas after leaving the Government Colleges for Elementary Teachers. ❖

Ellen van Kalmthout, a consultant for the Academy for Educational Development, conducted the Teacher Content Knowledge Study. Barbara O'Grady is a senior program officer at the Academy for Educational Development and the PED Program Coordinator. For more information, write to Barbara O'Grady, Academy for Educational Development, 1255 23rd Street, N.W., Washington, D.C. 20037.

Innovators in Education

For a variety of reasons, rote learning in the Social Studies has developed a strong foothold in many countries. In Malawi there is a long-standing tradition about preparing high school students for national exams. The best preparation, it is believed, is to fill the students' heads with as many facts as possible. And in truth, the final examinations do have a pronounced orientation towards testing factual knowledge. (From a vast store of sample questions I offer one: "Where did Magellan die?"—Who knows? Who cares?)

My teachers-in-training, who had experienced the educational system first hand, were as reluctant as any to experiment with innovative methods. The curriculum is extensive, they explained, and one must 'teach them the facts'. Thus, 'teaching' sometime comprised little more than writing notes on the blackboard for students to copy and memorize, in preparation for the dreaded final national examinations. Students, parents, and administrators, they argued, are only interested in memorizing the facts.

One can sympathize to some extent with the teacher's dilemma. I was told that, in particular, the high school students were unsympathetic to innovative methods that would be time consuming, might even disadvantage them in the perusal of their memory work.

In spite of the above cautions, we designed several simulation games in Malawian history which we tested successfully. Our greatest success and most easily adapted game was "The Malawi Game".

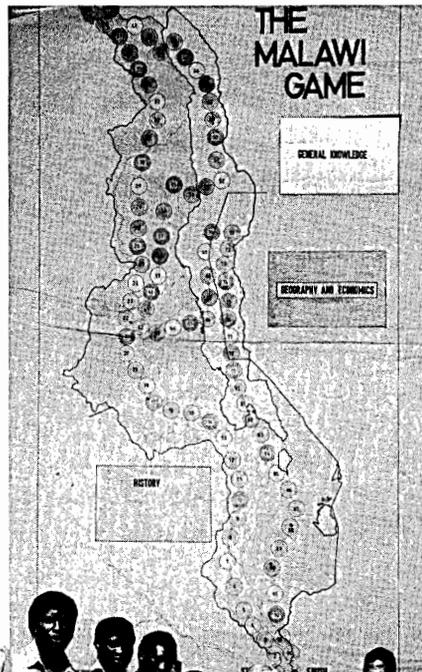
I will never forget the first day we took it for 'field testing' at Mulunguzi High School, in Zomba. I had always been impressed by the degree of passivity that characterizes students in Malawian schools, but the game showed that Malawian teenagers have the same vivacity, fire and enthusiasm

**"your vehicle
has been charged by
a rhinoceros.
Serious damage.
Miss one turn."**

one would find amongst students in any country in the world. The game was played in teams, and the excitement and enjoyment in the room was palpable. They cheered, laughed, clapped hands, groaned, did high-fives. And they learned a lot of facts in the process. The comments we solicited were all positive, but the one I remember most clearly was the student who wrote: "Could you come to our school every Friday and play the game?"

"The Malawi Game" is simple, easy to play, and adaptable to any country. You break the class into teams. Each team has a marker, and each takes a turn in rolling the dice and moving their marker around the differently colored (and numbered) circles on the map of Malawi. Each team draws a question card depending on the color and number on which their marker lands. If they answer correctly they remain on the number; if they cannot answer, the marker is moved back. The first team to traverse the map from the Start (Circle #1) to the End (Circle #95) is the winner. The colored circles relate to the four subjects on which questions can be asked. (Red=History; Green=Geography and Economics; White=General Knowledge). We included chance cards such as "your vehicle has been charged by a rhinoceros. Serious damage. Miss one turn."

The game was fun to design, and it's fun to play. It was relatively easy to produce, and it contributes towards making education what it should be for teachers and students everywhere—an enjoyable experience. ❖



Tom Cavanagh taught for three years in a teacher training college in Ghana, and for two years for the Department of Education of Malawi University, Zomba, Malawi. Currently he is Academic Dean at Champlain Regional College, Lennoxville Campus, Lennoxville, Quebec J1M 2A1, CANADA.

Please send your story about an innovator in education (with a photo, if possible) to The Forum Editor.

What's Happening

March 16-19, 1993

Comparative and International Education Society

1993 Annual Conference
"The Impact of Educational Reform in Comparative Perspective"
Kingston, Jamaica

Contact: Professor David N. Wilson
Ontario Institute for Studies in Education
252 Bloor Street, West
Toronto, Canada M5S 1V6
Tel: (416) 923-6641, Ext. 2312
Fax: (416) 926-4725

June 27-July 2, 1993

World Association for Educational Research

11th International Congress
"The Role and Place of the Humanities in Education for the World of the 21st Century"
Jerusalem, Israel

Contact: Professor Yaacov Iram, Congress President
c/o International Ltd.
P.O. Box 29313
61292 Tel Aviv, Israel
Tel: 972 3 5102538
Fax: 972 3 660604

June 30 - July 31

Harvard University

Educational Policy and Planning Workshop
Cambridge, Massachusetts, USA

Contact: Thomas Cassidy, Jr.
Harvard Institute for International Development, One Eliot Street
Cambridge, Massachusetts, USA
Tel: 617-495-9720
Telex: 275276
Fax: 617-495-0527

July 5 - 9

International Association of Special Education Third Biennial Conference

"Global Perspectives and Local Solutions in Special Education—A Vision for the Future"
Vienna, Austria

Contact: Congress Secretariat
1993 IASE Conference
c/o INTERCONVENTION
Austria Center Vienna
A-1450 Vienna, Austria
Tel: 43 1 23 69 26 41
Fax: 43 1 23 69 648

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Christina Rawley

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