

**FORMATIVE EVALUATION STUDY OF KACHI MATERIALS
DEVELOPED BY THE IMDC**

FINAL REPORT

MARCH 1994

DIRECTORATE OF PRIMARY EDUCATION

NWFP

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EXECUTIVE SUMMARY

BACKGROUND

Study purposes. The overall purpose of the present study has been to conduct a formative evaluation of three sets of instructional materials developed for Kachi (kindergarten) classes by the Instructional Materials Development Cell (IMDC) of the Directorate of Primary Education. The new materials include:

Beginning Urdu reading, writing, and comprehension materials

Beginning Math/Science materials in Urdu medium

Beginning Pashto reading, writing and comprehension materials

The language materials come in two volumes each, one for the first half of the Kachi school year and the other for the second half of the year. Each set of materials has an accompanying annotated teachers' guide that shows how to teach each lesson. These guides are also being evaluated in this study.

The four specific purposes of the evaluation study were:

- o to test whether the materials (textbooks and annotated teachers' guides) developed for the Kachi class in Urdu, math/science and Pashto meet the program objectives intended by the writers (see below);
- o to determine a minimum level of training required for teachers to use the materials effectively;
- o to recommend modifications in the materials and their support systems that would help them better meet their objectives;

Program objectives. The program objectives set for all subject matters by the developers were to produce materials that:

- o effectively teach the skills of literacy (reading, writing and comprehension) and numeracy;
- o are interesting to children;
- o help the teacher to teach effectively in the range of schooling environments that exist in NWFP.

Indicators of success. The standards/indicators set by the writers to constitute evidence that the program objectives for the materials have been met are the following.

- o **Skills:** To indicate that the materials effectively produce the skills of literacy (reading, writing, and comprehension) and numeracy, it was expected that a majority of classes would have an average score of 75 percent correct or higher. The test used in the evaluation was similar to those found in the review sections of the materials.

- o **Attractiveness:** To indicate that materials were attractive to children, a majority of teachers were expected to rate the materials high on relevance to the experiences and age levels of children, and on their interest level.

- o **Teacher effectiveness:** To indicate that the materials helped the teacher teach effectively in the range of environments that exist in NWFP schools: a) a majority of teachers would respond positively to a set of questions asking about the usefulness of the annotated teachers' guide; b) 80 percent of students would be engaged in learning tasks related to the materials when observed by a supervisor visiting periodically, and c) children in the main Kachi learning contexts (large and small classes, single and multi-classes) would perform on an achievement test at the 75 percent correct or higher standard.

Study phases. Kachi materials were introduced in three phases which each time expanded the use of the materials to larger samples of classes until approximately 800 classes. There were also two main cycles of testing, one at the mid-year and one after the materials had been used for a complete year.

CONCLUSIONS

General. Overall, the evaluation study of the new materials went well despite the fact that the materials and the approaches were new to everyone involved--developers, teachers, students, SDEOs, ASDEOs and LCs, and despite numerous difficulties in the publication and distribution of the second language volumes. To observers watching the Kachi children taking the achievement tests, it was clear that most children were performing well. After using the materials for a year, they could read simple words and sentences with understanding, write words, and had developed the first skills of analytical thinking by discriminating the abstract qualities of objects and identifying patterns in collections of items. Children exhibited a high degree of learning in all classes where teachers

conscientiously used the new materials.

CONCLUSIONS

Meeting program objectives. All the initial materials and most of the second set of Kachi materials met the standards set by the developers. On the three program objectives they were assessed as follows:

- o **Teaching literacy and numeracy skills:** With one exception, the materials (textbooks and annotated teachers' guides) met the standards that more than half the classes in a district or tehsil (or province in the final test), would obtain a class average of 75 percent or higher. The one exception was the second set of Urdu materials where the problem could be isolated to boys' classes in one district where transfers of teachers and supervisory staff, and a delay in the distribution of materials caused the support system for the materials to break down.
- o **Attractiveness of the materials.** On all counts of being interesting to children, relevant to their experiences, suitable for their ages, etc. teachers gave the initial materials (where the question was asked) in all subject matters a high rate of approval. The responses exceeded the majority of positive answers required to meet the developers' standards.
- o **Helping the teacher teach effectively.** The indicators that the initial materials helped the teacher teach effectively were all met: a) The majority of the teachers responded positively to a set of questions about the usefulness of the annotated guides. b) More than 80 percent (87 percent in Urdu, 86 percent in Math/Science and 91 percent in Pashto) of children were found to be engaged in learning tasks related to the materials on the number of occasions when an observer monitored the class. c) Children in the main Kachi learning contexts (large classes--over 40 students, and small classes--under 40 students, and single and multi-classes) performed to the IMDC standard on the achievement test in all subjects. Girls also consistently did better than boys which, while cause for inquiry, is perhaps a positive sign, since in BRIDGES studies conducted in higher classes, girls tended to have lower achievement results.

Results of the additional study objectives:

Teacher training. The study tested two training packages to determine the minimum training required for teachers to use the materials effectively. There were no essential differences in the scores of students in the classes of T1 (IMDC trained) and T2 (SDEO, ASDEO and LC trained) teachers. Therefore district staff demonstrated that they could effectively train teachers in the use of new materials. As noted above, results may depend more on a system of carefully monitoring teachers through frequent visits and achievement testing than on lengthy or theoretical training.

Support systems. What became apparent from observations in the classroom in the first testing cycle was the fragility of the support system organized by the IMDC. To sustain long term use of

the materials, it will be important to vitalize a system that has been slumbering--where teachers are present but not teaching, where supervisors have little impact on the quality of instruction, where teachers avail themselves of frequent leaves, where, in short, little learning takes place. Thus the Kachi evaluation clearly indicates that in subsequent trials more attention be paid to identifying supports for teachers and providing on-the-job staff training in skills that are needed to sustain the program.

RECOMMENDATIONS

The following recommendations suggest ways to improve the systems that support use of the materials (details of modifications required in the materials are found in an annex).

Expanding the use of experimental materials. The initial trials of the Kachi materials made clear the need for strengthening systems to support instructional improvement. For that reason, it was recommended that the experimental use of the materials be expanded as broadly as possible to a few schools in each district and major tehsil in NWFP to start the process of building support systems. Without this expansion, much time would be lost in building these systems when materials are ready for dissemination to the entire province.

Evaluating the new materials in the later testing cycles. With the decision to expand the experimental sample, it was recommended that the evaluation design be simplified to cope with the much larger number of schools. The initial trials of Kachi materials basically validated the methods and approaches used in the materials and, therefore, a simpler evaluation design for the second-half-of-the-year Kachi materials seemed a viable way to proceed. The simplified design emphasized the monitoring of skill development and included fewer evaluation proformas, less confusing test formats, a smaller sample of students from large classes, twice yearly instead of three times yearly testing, etc. These simplifications made it possible for the IMDC to continue to have a role in the evaluation of all the districts.

Urdu weaknesses. By the end-of-year testing of the Kachi materials, only one group seemed to be having significant difficulties with skill development in a subject area. That was the boys' classes in Urdu language. Because of the difficulties encountered in the field, and because the poor results tended to be localized in the boys' schools of one district, it was difficult to conclude that this weakness was inherent in the materials or the instructional system supporting the materials. The recommendation, therefore is to strengthen the system that supports the use of Urdu materials in this district so that supervisors can monitor the situation carefully in their own district.

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1 BACKGROUND

1.1 The problem. For long, educators, teachers, students and parents have complained that instructional materials in Pakistani schools are not effective means of teaching literacy and numeracy skills to primary school children. They complain that materials are sometimes too difficult for the teacher to teach or for the students to understand at their levels of cognitive development. Subject matter is often irrelevant to the children's lives and experiences, and the materials may be unclear, or even confusing to young children. In most cases, they are so dependent on a teacher's direction that they cannot be used alone by students when a teacher is called away to teach another class, as is the case in the multi-classes found in most rural schools. The teacher, also, may be weak in the content matter or may not know appropriate techniques for teaching effectively. Because of these inadequacies, they may rely on the rote memorization of subject matter to simplify the task of instruction. Many Pakistani educators feel that the quality of primary instruction will only improve with a thorough revision of the instructional materials for the primary program.

1.2 Creation of the IMDC. In October 1991, an Instructional Materials Development Cell (IMDC) was established in the Directorate of Primary Education in Peshawar. The staff was recruited from promising young primary school teachers with high (BA, BSc and MA) academic qualifications and at least 5 years teaching experience. Out of 50 candidates who appeared at a preliminary workshop to test their suitability, 13 became subject specialists and researchers for the Cell. Primary school teachers were chosen because they were familiar with conditions in the classrooms, and with students and teachers in the field. The aim of the Cell was to develop instructional materials and the associated teachers' guides for the main academic subjects--math, science, Urdu and Pashto in Kachi through Class Five.

1.3 Background studies. To serve as a basis for program development, the Directorate of Primary Education conducted two studies in September 1991: a Kachi (kindergarten) and a multi-class study. Among the findings of the studies were that no instructional materials were specifically designed for the Kachi Class and that it was customary for instruction in this class to consist solely of the memorization and recitation of alphabets and numbers. Resources were not officially provided to Kachi classes even though Kachi students constituted roughly a quarter of the primary enrollments in the sample schools and consumed about a quarter of the teachers' efforts. The Kachi class was usually

the largest class in a school with enrollments commonly totalling 50 to 100 students.

The studies made clear that improving student learning in this and other early primary classes would significantly increase the learning of the bulk of primary children. Indeed if learning were significant in Kachi classes, a full school year could be added to the academic program at an early age before students, especially girls, were likely to drop out without having consolidated basic skills. Moreover if the materials were interesting to children, it was possible that schooling might be attractive enough so children would continue on to Class One, rather than dropping out in large numbers between Kachi and Pakki Classes as statistics of the time seemed to indicate they were doing.

The multi-class studies added more conditions to the kinds of materials that were needed. These studies showed that the heavily teacher-dependent materials made it difficult to assign independent work to students, causing teachers to fall back on memorization as an easy way to solve the problem. Teachers also seemed to lack academic qualifications as evidenced in their low graduation (division) scores and the numerous mistakes observers noted them making in the classroom. Multi-classes showed large variations in the numbers and ages of students and, like Kachi classes, were deficient in instructional aids, materials and classroom facilities. It was concluded that the education program could be improved in both types of classes with instructional materials that addressed the most important needs of these classrooms, specifically, improving student skills, and making the materials both user-friendly and less teacher-dependent.

Both studies confirmed impressions that teacher support systems were weak. Supervisors (ASDEOs and LCs) visited schools infrequently and usually conducted inspections rather than provided instructional support. There was little monitoring or expectation that teachers should be held accountable for the learning of their students. By the time district-wide tests were administered at the end of Class Five, it was too late to solve problems that had started much earlier in the primary program.

To start involving supervisors, the Directorate of Primary Education invited ASDEOs from every district of NWFP to participate in carrying out the Kachi and multi-class studies. They were trained to sit quietly and observe teacher instruction, and to fill out simple observation proformas. It was the first time most of them had spent time observing rather than "inspecting" teachers. In the process of conducting these studies and discussing the results, supervisors became better acquainted with the problems of teachers, while at the same time learning the basic skills of data collection and classroom observation that would be required when new materials were introduced later.

1.4 Preparing instructional materials. In 1991 the IMDC staff began writing Kachi materials to address the needs identified in the background studies. Under the supervision of a curriculum specialist provided by PED, they were trained to write instructional materials following Pakistani curriculum objectives (in the case of the Kachi materials these were derived from Class One objectives), and to write them according to general education criteria related to scope, sequence, conceptual complexity and the developmental level of children. Illustrations were prepared for the text that showed local details and contained a balance between male and female figures. Evaluation sections were distributed throughout the books to assist the teachers in determining if the children

were acquiring the intended skills. When the Kachi textbooks in Urdu, Pashto, and math/science were completed they were checked for accuracy by experts in the subject matter. The Kachi books were then produced in experimental editions, with languages books divided into two volumes for the full school year and a math/science book complete in one volume.

Accompanying the textbook and also written by the IMDC staff was a teachers' guide with simple but complete instructions on exactly how to teach each lesson. The lesson format used in the guides was based on a six step process, found in a 1989/90 BRIDGES study conducted in Pakistan to be associated with higher student achievement: a) review, b) focusing on a topic, c) clear presentation of new materials with examples, d) guided practice, e) independent practice and f) homework (except at the kindergarten level). Teachers were trained in this format and knew they could expect it with every lesson. By providing detailed teaching instructions, developers hoped to move teachers away from an instruction based primarily on memorization.

When the Kachi textbooks and teachers' guides were ready for experimental trial, field-testing began.

2 FORMATIVE EVALUATION STUDY

2.1 Introduction. A formative evaluation is one which gathers information useful to developers so they can improve new materials or programs until they meet specified standards. To be effective, a formative evaluation should meet at least three criteria. It should provide sufficient information to help the developers perform their task of preparing high standard products. It should provide answers to broader questions about what kinds of support are needed to ensure effective use of the new products. Finally it should be responsive to the need for new for information over the course of the study. In the evaluation conducted by the IMDC for its Kachi materials, the scope of the study included also the training of individuals who would be instrumental later in supporting the materials in the field.

2.2 Purposes. The overall purpose of the study was to conduct a formative evaluation of three sets of instructional materials developed by the IMDC for Kachi classes. The materials included:

Beginning Urdu reading, writing, and comprehension materials

Beginning Math/Science materials in Urdu medium

Beginning Pashto reading, writing and comprehension materials

Each of these sets of materials has an annotated teachers' guide that shows how to teach each lesson. These guides were also evaluated in this study.

2.3 Specific study objectives. The specific types of information gathered during the evaluation study were aimed at:

- o testing whether the materials (textbooks and annotated teachers' guides) developed for the Kachi

class met the program objectives (see below) and to recommend modifications, where necessary, that would help them better meet the objectives;

- o determining whether the materials would be effective in the main schooling environments of NWFP: urban and rural, male and female, large and small, single and multi-class;
- o determining the kinds of support required to ensure effective use of the materials in the field;
- o determining the minimum level of training effort required by the IMDC for teachers to use the materials effectively.

2.4 Program objectives. The program objectives set for the Kachi materials developed by the IMDC were that they:

- o effectively teach the skills of literacy (reading, writing and comprehension) and numeracy;
 - o are interesting to children;
- o are easy to use and help teachers teach effectively.

2.5 Indicators of success. The standards/indicators set by the writers to constitute evidence that the program objectives had been met were the following.

o **Skills:** To indicate that the materials effectively produce the skills of literacy and numeracy, it was expected that more than half the classes of a district would receive a class average score of 75 percent on a test prepared by the IMDC staff.¹ The test was composed of items similar to those found in periodic review sections in the children's textbooks.

o **Attractiveness:** To indicate that materials were attractive to children, a) a majority of teachers were expected to rate the materials relevant to the experiences and age levels of children, and b) held their attention, as determined by student engagement scores tallied by supervisor observers. The standard for engagement was 80 percent of the students engaged in learning tasks when observed at intervals during a lesson.

o **Teacher useability:** To indicate that the teachers found the materials easy to use and that they helped the teacher teach effectively: a) a majority of teachers were expected to respond positively to questions asking about the usefulness of various parts of the annotated guide, b) 80 percent of students were expected to be engaged in learning tasks related to the materials even when the teacher was not directly involved with the class, and c) a majority of the class scores of children in the main Kachi learning contexts (male and female, urban and rural, large and small classes, single and multi-classes) and of teachers having various characteristics (training, experience, etc) would

¹ An earlier indicator based on individual children's scores was converted to this class score for greater convenience.

total 75 percent or more correct answers on an achievement test.

2.6 Introductions of new materials. The Kachi materials were first introduced in three phases: experimental, pilot and extension phases. In the experimental phase, the new materials were introduced for the first time to a limited number of districts. Care was taken in this phase to see that detailed information about the materials and their use was collected and analyzed for immediate revisions. In the pilot phase, which started a few months later, the revised materials were introduced to a number of new districts and their main tehsils, and in the final extension phase, the same materials were introduced to off-shoot tehsils by experienced master-trainer ASDEOs from parent districts. At the end of these three phases, all of the districts (and most of the tehsils) had received Kachi materials. Eventually the three phases were collapsed into two: the experimental and pilot phases, or as they later came to be called "intensive" and "extensive" phases.²

In each district or sub-district materials were introduced in sequence. Each sample teacher started with one Kachi subject. Subsequently, they received cross training in the subject, either math/science or language, for which he or she had not yet received training. Pending the availability of materials, introductions and refresher training were conducted twice yearly in September and March after the major holidays. Following the introduction of Kachi materials, teachers continued with Pakki and Class Two materials in the same way.

2.6.1 Training. In the first introductions of new materials, the IMDC staff spent a week in each district training the teachers and supervisors (male and female ASDEOs and LCs) in how to use the student textbooks and teachers' guides. The training consisted of helping them understand the "effective teaching practices" method used for each lesson of the teachers' guide, explaining the main subject concepts covered in the books, and giving them enough practice so they felt comfortable with the teachers' guides for the materials they would be using.

With 50,000 primary teachers in NWFP, one task of the study was to find ways to train teachers in new materials as cost-effectively as possible. The task was difficult because the methods for teaching the new materials were very different from previous methods of instruction. The process of training, however, was eased by the single format instructions found in the teachers' guides for each lesson. Teachers could learn the format and expect to use it with every lesson: there were review questions, stories to help present new materials, and exercises with answers for use in guided and independent practice. A question remained, however, whether the small IMDC staff would be required to train teachers in all the districts to use the guides or whether master trainers could be trained in the materials and convey them reliably to teachers in their districts. An experiment was therefore conducted in the first cycle of the evaluation to determine which of alternative training methods could be used to introduce the materials most cost-effectively (see below).

2.6.2 Supervisor role. As part of the training, supervisors and teachers were organized in a chain of accountability for student learning. The teacher taught the students, the LC supervised and

²They were collapsed into two phases for convenience: eight tehsils which had completed the Kachi materials moved on to the Pakki materials, while the rest received Pakki materials in the next rounds of introductions when they were ready.

supported the teacher, the ASDEO was responsible for training the teacher and supervising the work of the LCs and the sub-divisional officer (SDEO) assumed overall responsibility for the tehsil. Supervisors were assigned a schedule for visiting the experimental schools on a weekly basis to fill in observation proformas about the use of the new materials. The visits provided an opportunity for supportive interaction between supervisors and teachers--an important training objective, while the proformas provided field information about the materials, as well as evidence that supervisors' visits took place. Supervisors who proved to be effective, as seen by student results and the support they gave to teachers, were designated master trainers to help introduce materials in new tehsils, and to train their own teachers in the next new materials. After one or two field-testing cycles in their districts under the supervision of IMDC staff, these master trainers were routinely called to Peshawar for training in new materials and for refresher training in "old" materials, and sent back to train other supervisors and teachers in their districts. Pakki and English materials were introduced through the master trainers in this way.

2.6.3 Testing and feed back. Approximately six weeks after the first training and at periodic intervals thereafter, the IMDC staff returned to test the students in experimental schools. The tests were constructed by IMDC staff from items similar to those in evaluation sections of the new materials. If the teacher followed the teachers' guide and taught the lessons as indicated, the children could complete the test easily. It became immediately clear during the testing whether the children had been taught the new materials or not. If all the students of a class appeared to have difficulty with the test (and in other classes there were high test scores), the teacher would be asked to go again for retraining by the master trainers. If all children had difficulty with certain test items, these parts of the books and teachers' guides were reviewed and improved by IMDC staff.

In the first phase, information from achievement tests, student engagement proformas, interview forms and supervisor observation forms were entered into computers in Peshawar, analyzed and fed back to the IMDC developers who modified the materials and also what they would stress in the next training program. The results were also produced as tables containing supervisors' names, schools' names, teachers' names and students' results in the form of a class average. The class average constituted a performance score for supervisors and teachers. These tables were brought back to district officers and discussed with them in detail.

When the Kachi materials reached final draft form after the initial field testing they were reviewed by a committee from the Curriculum Wing in Islamabad, who approved them with minor changes for full dissemination to all of NWFP. The IMDC staff revised the materials in line with the Committee's recommendations and they are now awaiting publication by the Textbook Board.

2.7 Samples. As already noted, Kachi materials were initially introduced in three phases for each set of materials: the experimental phase, the pilot phase, and the extension phase. Each successive phase expanded the number of districts and tehsils using the materials.

2.7.1 The experimental sample. The first Kachi textbooks and teachers' guides were introduced beginning in April 1992 into three districts, Bannu, Swat and Chitral. Altogether the materials were tested in 248 classes: Math/science (127), Urdu (82) and Pashto (39). The three

districts were chosen on the basis of specific criteria: the medium of their instruction (Urdu or Pashto), the willingness of their staff to participate in the experimental testing of the materials, and the absence of programs such as PEP II, UNICEF and the Pak-German project that might interfere with the new materials. Bannu and Chitral were selected to use Urdu language and math/science, and Swat to use Pashto language and math/science materials.

To address the question of cost-effective training in the materials, IMDC conducted two kinds of experiments: comparing overall treatments in two kinds of sites, intensive and extensive, and with two kinds of teacher training. In the first experiment, Bannu and Swat, as intensive sites, received a week's training by IMDC staff for their supervisors and experimental teachers in the use of the new materials, and the IMDC staff returned to administer achievement tests every 6 weeks.³ As an extensive site, Chitral received the same one week of training by IMDC staff, but monitored the program themselves with little further assistance from IMDC.⁴

In the second experiment, two teacher samples of approximately equal size were chosen for each set of materials tested: the first group of teachers (T1) received Treatment 1--training by the IMDC staff. The second group of teachers (T2) received Treatment 2--a brief training by ASDEOs (who had been trained by the IMDC in Treatment 1) (see ANNEX E for this training program). In both cases, to encourage use of the materials, teachers were told that there would be monitoring visits by the supervisors and achievement testing at the end of the six week trial period.

The total number of teachers in the treatment groups of the three districts are shown in Table 1.

Table 1: Teacher samples in the experimental phase--April 1992

Location	Number of teachers					
	T1		T2			
	M	F	M	F	M	F
BANNU						
Math	10	5	10			5
Urdu	11	5	10			5
SWAT						
Pashto	13	11	13	11		
CHITRAL						

³It eventually became necessary to reduce the testing to twice yearly in May and December as the number of experimental schools increased in subsequent evaluation cycles.

⁴Chitral is largely inaccessible during all but the summer months, and therefore to be involved in the program at all, they need to be self-sufficient. The IMDC staff has visited them once a year in summer.

Math	5	2	5	2
Urdu	5	2	5	2
(Mastuj tehsil)				
Math	-	-	6	-
Urdu	-	-	6	-
TOTAL	44	25	55	25

The teacher samples were selected in a random fashion by drawing the names of schools out of a hat. All the schools in the pool were within 10 kilometers of the district capital (for the practical reason of making it possible to supervise the use of the materials closely). First, a T1 school was chosen and then a T2 school was chosen until the full list was selected. Then T1 and T2 schools near each other were paired and each ASDEO or LC was given one set of teachers to supervise.

Because of the frequent supervision visits required for the introduction of new materials, the smallest number of sample units possible were selected that would give confidence in the findings. For each set of materials, a minimum of 30 schools was selected for each teacher treatment group. If more than one Kachi section existed in a school, both Kachi teachers participated, making for a slightly unequal number in the T1 and T2 groups of Bannu and Swat. The remote Mastuj tehsil also added an extra 12 T2 teachers to the Chitral group.

2.7.2 The pilot sample. The "pilot" phase, starting in September 1992, introduced the same Kachi materials in four new districts--Mardan, Kohat, Dir and Mansehra. The total new classes were 239: math/science (118), Urdu (53) and Pashto (68). Again in April 1993, the materials were introduced in the final pilot districts--Peshawar, DIKhan, Noshera, Karak, Kohistan, Abbottabad and Haripur. The total new classes were math/science (113), Urdu (112), Pashto (21). As in the experimental phases, once the materials were introduced, they were provided to the districts in sequence and teachers were cross-trained in new subject matters. The IMDC continued to come regularly to train teachers and supervisors and to test students. As the supervisors became experienced, more of the training and testing were given over to them, especially after the initial rounds of testing validated the effectiveness of the books and guides. The principle that guided the sampling at this stage was that one or more schools should be selected within each ASDEO's area so that he or she would experience the supervision of the materials either directly or indirectly through supervising the work of LCs.

2.7.3 The extension sample. The third or "extension" phase, starting in November 1992, introduced Kachi materials to offshoot districts by master-trainer supervisors from their parent districts with minimal involvement of the IMDC. Thus, for example, materials were introduced into 20 math/science and 20 Urdu classrooms of Lakki district by Bannu staff and into 16 math/science and 18 Pashto classrooms of Buner by Swat supervisors. The extension phase continued in the next cycle with cross-training in old districts of new Kachi subjects and introductions of Kachi materials for the first time in new districts: Swabi by Mardan, Balakot by supervisors from Mansehra and Tank

by Bannu supervisors.

This extension phase completed the initial introduction of materials to all the districts except Charsadda, which was under the Pak-German project, and Malakand which was the UNICEF experimental district. Eventually Malakand asked for the math materials and were trained by the IMDC in this subject only. Each district then continued the routine process of being introduced to new materials in sequence and being tested in how well the students learned from their use. Because the IMDC worked with SDEOs at the tehsil level in most districts, this meant that as tehsils upgraded to districts over the period of the evaluation, as was the case when Battigram split off from Mansehra and Lakki from Bannu, etc. the new Kachi materials and training had already reached the newly created districts.

By February 1994, IMDC Kachi materials had reached 778 classes (592 boys' and 186 girls' classes) in 30 tehsils of NWFP. This constituted most of the tehsils and roughly 6 percent of the approximately 12,000 government primary schools in the province.⁵ The math/science materials are present in all of the sample schools, Urdu in 668 (86 percent) of the schools, and Pashto in 336 (43 percent) schools. A few schools have all three sets of materials. ANNEX A shows the breakdown of the sample in 1994 at the end of the evaluation study.

2.8 Proformas and procedures. There were four instruments and a number of achievement tests used to evaluate the Kachi materials:

- o **Achievement tests** were administered twice a year in the last part of May and in early December before the major vacations for the Northern and Southern areas. As already noted, the time varied depending on when the classes received the materials. The test was based on review sections found in the materials. The pictures and figures were rearranged and other changes were made to avoid memorization of the tests. IMDC staff, with the help of the ASDEOs/LCs supervised the administration of the tests in all the schools in the experimental phase, while in later phases IMDC conducted a sample of tests and left the rest of the testing to the ASDEOs and LCs. All the results were entered into the computer and analyzed in Peshawar.

- o **Teachers' characteristics forms (Form 1)** were filled in at the time of the testing.⁶ By correlating teacher characteristics with class scores it was possible to determine if there were any consistent variations in the way different kinds of teachers used the materials.

- o **Teacher questionnaires (Form 2)** were left in each school during the first phase to solicit answers about each unit of the text and its annotated teachers' lessons. Most of the questions concerned the relevance to children, level of difficulty, appropriateness and usefulness to the teacher

⁵Not counting mosque, maktab or other primary schools

⁶Earlier this form was collected during training and had to be recollected again during testing in cases where teachers were transferred over the course of the trial. It therefore seemed more appropriate to collect this information once only during testing.

of the format and content. These were collected once a week from all the intensive schools by the supervising ASDEOs/LCs. There were approximately 6 (from Bannu teachers) and 8 (from Swat teachers) completed teacher questionnaires from each school in all samples. In general, teachers did not make many comments other than to support the usefulness of the materials. In later trials this form was dropped and an interview about the materials was added to Form 1.

- o Classroom **observation proformas (Form 3)** were filled in by the ASDEOs during one lesson of each unit in each class. **Student engagement** measures were tallied during the observed lessons. These were constituted another proxy for learning, and also indicated whether the materials and presentation interested children. Approximately six units of the new materials were observed in each of the sample schools during the first six week trial. During the first testing cycles, these forms were entered into the computer and analyzed in Peshawar, but in later cycles as it became clear that they yielded overwhelmingly positive responses, the form was simplified to become a general supervisor monitoring form and served for the IMDC as one concrete means of demonstrating that supervisors were visiting the classrooms.

- o Teachers' interview forms (**Form 4**) were filled in by IMDC staff at the same time the achievement tests were administered to students, that is, at the end of each trial period. The interviews asked specific details about the materials after the teachers had had a chance to use them for some time and had become familiar with the method. In later cycles this form was merged with Form 1, and both were simplified.

By the end of the Kachi trials, the instruments had been simplified and reduced in number to a teachers' characteristics and interview form, a classroom observation form and achievement tests.

3 FINDINGS

3.1 Extenuating circumstances in the field. The study depended heavily on student test scores to assess the effectiveness of materials. Even though care was taken to avoid bias in the results, the extensive nature of the study objectives--creating support systems as well as testing the materials, meant inevitably that there would be some problems.

Circumstances that may have affected the results of the study in all phases include the following:

3.1.1 Difficulties in distributing books on time: Delays in printing the experimental materials, a problem beyond the control of the IMDC, caused delays in introducing the materials and sometimes in testing the full 6 weeks work before major holidays. Sometimes, also, individual supervisors did not distribute the books in a timely way to their schools. Where this was known, children were only tested on those items of the achievement tests which their teachers had covered.

In later cycles, these difficulties became more pronounced, and, in some instances where new materials were not available until several months after children were ready for them, local officials and teachers went back to teaching the old books for a time. As a result, many students only finished Kachi materials after they had moved to Pakki class. For the most part, however, the experimental

districts did not have this problem during the first introductions of materials, and therefore the results of this first, more "regular" phase are reported in more detail below.

3.1.2 Testing: A number of difficulties were encountered in testing, including in the first cycle (see ANNEX D for details): confusing test items and formats; difficulties in giving pencil and paper tests to young children (sometimes the children could respond orally to words written on the board but became confused when asked to match a word and a picture on paper); and organizing the test for classes where students sometimes reached numbers close to 100. In later cycles, the test items were revised and a better format was developed that prevented children from confusing separate test items. Also the testing sample was cut to a maximum of 20 students per class selected randomly from the children in the register with regular attendance.

3.1.3 Supervisor cheating. After the first few cycles, the IMDC began turning some of the testing over to the supervisors. The initial attempts to do this resulted in cases of inflated class scores. The IMDC staff anticipated this possibility and spot-checked a few schools in every district to compare their findings with supervisor findings. At each training the IMDC stressed the importance of the testing as a way to know how children are learning. Without accurate test scores, it would be difficult to know how to improve instruction. Over time the assessments seem to have become more accurate, and presumably as results come to be analyzed in the districts they will be perceived as less threatening.

3.1.4 Teacher apathy. After receiving training, a few teachers simply went back to their classes and taught with the old books and methods, ignoring the new materials. Children in their classes could not complete any of the test items. When it was apparent what they had done, the teachers were retrained and the IMDC returned between cycles to test their classes again. The initial zero scores were not included in the results, under the assumption that they were not a fair reflection of the use of the materials since no materials had been used.

3.1.5 Frequent transfer of teachers and supervisory upset the process of introducing the materials in some places since incoming staff were not usually trained in the new materials.

3.1.6 Frequent casual and other leaves of teachers meant sometimes that the children had not been taught as much of the materials as expected. When this occurred, the IMDC staff only tested the children on those parts of the tests that had been covered.

3.2 General findings. The first evaluation phase of the Kachi materials demonstrated that the basic approach developed by the IMDC, even though radically different from what had been used previously in Kachi classes, could work, that is, with only minimal training the materials could be used easily by teachers to produce high levels of student learning. It was possible to draw this conclusion after a short trial period because the lessons were based on patterns that once established in the early parts of a book were repeated again and again. Once the basic approach was validated, future modifications were only required in the details and the pacing of lessons.

What became apparent during the evaluation, however, was the extent to which the primary program

had deteriorated in the absence of effective systems for monitoring and assessing the results of classroom instruction. Teachers had been largely on their own, and faced with the immense difficulties of multi-class teaching, excessively large classes and difficult-to-use instructional materials, spent much of their time socializing while students continued to memorize their lessons. When supervisors arrived for their infrequent visits, teachers showed them what they wanted to see which, in the case of the Kachi class, was well-memorized alphabet letters and numbers.

The difficulty of reversing such a situation is impossible to exaggerate. The new materials, though purposely made easy to use, still required work, and it was clear that without an expectation that someone would be coming regularly to monitor their use, teachers would revert to their old patterns of teaching by rote. The IMDC tests which required a teacher to teach the new lessons if her class was to obtain a high score revealed within minutes how much instruction had actually been completed. The problem in introducing new materials, therefore lay in motivating supervisors to monitor the instruction adequately and accurately. Many of them also preferred to sit comfortably in offices, and turn in bogus reports, rather than cope with the complaints of teachers in the field. Most offices also simply did not have the resources for transport to send supervisors into the field frequently enough.

Observations in the classroom also revealed significant problems in classroom management, teacher subject content knowledge, and the lack of support materials that would keep children learning when daily book lessons were over or when a teacher turned her attention to another class. Thus the main findings of the initial phase of the evaluation showed the importance of:

- o creating a continuous monitoring system for classroom instruction,
- o developing additional instructional support materials for the classroom and
- o preparing training units for preservice and inservice teachers that would improve both their knowledge of the subject and their ability to cope with conditions in their classrooms

The first phase evaluation thus showed the importance of refining the accountability structure in instruction. Such a "culture of professionalism" takes time to develop, and with this in mind the IMDC decided to expand its introductions of materials to most tehsils in the pilot and extension phases, even if only in a limited way, so that this attitude would have time to develop before large-scale disseminations of materials. Also during these phases the supervisors were trained to carry out assessments themselves with spot-checks by IMDC staff. By June 1994 they were able to conduct assessments on their own. In a workshop in Peshawar during that month, they discussed their results, planned remedial actions and received training in a newly-developed monitoring manual containing instructions and items for use in testing.

3.3 Specific findings from the experimental phase. Findings for the Kachi evaluation must be presented in two parts. During the experimental phase, as already noted, the emphasis was on the validation of the approaches and methods used in the new materials. In that phase, the training (except for T2 teachers) and testing activities were conducted entirely by IMDC staff so the test

results were reliable, and the analyses were more exhaustive. Subsequent phases emphasized training district staff to assume the responsibility for introducing, supervising and testing the materials themselves. These later phases used the monitoring of achievement results as a way to ensure that skills were being learned and that the system was working.

3.3.1 General observations. To observers watching the children taking the achievement tests it was clear that where teachers (most of them) conscientiously taught the materials during trial periods, children were performing well. They could read simple words and sentences with understanding, and they were learning the first skills of analytical thinking by discriminating the abstract qualities of objects and identifying patterns in collections of items.

3.3.2 Findings by subject matter. The first evaluation phase of the Kachi materials produced the following results by subject matter:

Urdu materials. Urdu materials were tested in 32 Kachi classes in 31 schools of Bannu. A total of 836 students took the achievement test after approximately 6 weeks of use.

- o The average class score was 73% correct responses.
- o In over half (56%) the classes the students as a whole scored 80% or more correct.⁷
- o Students of female teachers scored slightly higher (78%) as a class average than students of male teachers (72%).
- o Students of T1 teachers scored slightly higher (74%) as a class average than students of T2 teachers (71%).
- o Achievement was almost the same in single (72%) and multi-classes (73%).
- o Achievement was the same in classes where teachers taught fewer than 40 students (73%) and where they taught more than 40 students (73%). However very small classes of 20 or fewer students had higher achievement (79%) compared to very large classes of over 60 students (71%).
- o More than a quarter (27%) of the children scored 100%, and about one half (48%) scored 80% or more.
- o 87% of children were engaged in instructional tasks related to the materials as measured by observers over several class lessons.

Math/Science materials. Math/Science materials were tested in 32 Kachi classes in 30

⁷This 80 percent standard was changed to more than half the classes of a district obtaining 75 percent correct in later testing phases.

schools of Bannu. A total of 718 students took the test.

- o The average class score was 81% correct responses on the tested items.
- o In over three-quarters (76%) of the classes the students as a whole scored 80% or more correct on the tested items.
- o Students of female teachers scored considerably higher (87%) as a class average than students of male teachers (79%).
- o Students of T1 teachers scored slightly higher (82%) as a class average than students of T2 teachers (80%).
- o Achievement was almost the same in single (78%) and multi-classes (82%).
- o Achievement was considerably higher in classes where teachers taught fewer than 40 students (89%) compared with classes of over 40 students (79%).
- o One-fifth (20%) of the children scored 100%, and considerably more than one-half (63%), scored 80% or more.
- o 86% of children were engaged in instructional tasks related to the materials as measured by observers during several class lessons.

Pashto materials. Pashto materials were tested in 46 Kachi classes in 36 schools of Swat. A total of 2255 students took the test.

- o The average class score was 76% correct responses.
- o In almost half (42%) the classes the students as a whole scored 80% or more correct on the 8 tested items.
- o Students of female teachers scored considerably higher (81%) as a class average than students of male teachers (71%).
- o Students of T1 teachers scored almost the same (76%) as a class average as students of T2 teachers (75%).
- o Achievement was almost the same in single (76%) and multiclassses (78%).
- o Achievement was about the same in classes where teachers taught fewer than 40 students (76%) and where they taught more than 40 students (77%). Overall the classes in Swat tended to be very large. More than three-quarters (82%) contained more than 60 students.

- o More than a quarter (27%) of the children scored 100%, and about one half (46%), scored 80% or more on the test.
- o 91% of children were engaged in instructional tasks related to the materials, as measured by observers during several class lessons.

3.3.3 Teacher characteristics. The IMDC anticipated that teachers with certain characteristics might find the materials easier or more difficult to use. Research conducted in Pakistan by the Harvard BRIDGES project showed that certain teacher characteristics were associated with variations in fourth and fifth class student achievement scores. They found, for example, higher student achievement when teachers spent more years in academic training. To test whether teacher characteristics might be affecting results, class scores were correlated with several of these teacher characteristics.

The first evaluation phase which tested these issues more exhaustively, found few differences in the results related to teacher characteristics. Table 2 shows (when single case characteristics are removed from the results) that there were no identifiable differences in the use of materials that related to years of academic training, degree level, or professional training. On the other hand, students of teachers who had been longer in service (16 years or more) had consistently lower scores than the students of teachers with less time in service. This may reflect a more rigid attitude about the adoption of new materials in teachers who have used other books and methods for many years. The most successful students were the ones whose teachers had 5 to 10 years of experience, that is when the teachers were not totally new to the classroom, and were also not so rigid in their view that they were unable to adapt to new ideas.

Table 2: Teacher characteristics and student achievement (first Kachi evaluation cycle)

Characteristics	Average class score (% correct)		
	U	M/S	P
Qualifications			
Academic			
Middle	--	--	--
Matric	69	80	82
FA	75	75	78
BA/BSc	72	83	67
MA/MSc	90*	89*	69
Division			
I	65*	--	--
II	73	85	75
III	59	73	77
Profess. Training			
Untrained	64*	85	83
PTC	74	74	79

CT	68	85	69
BEd	90*	81	78
MEd	--	--	--
Teaching experience			
Up to 5	66	82	76
6 to 10	83	88	81
11 to 15	74	81	76
16 and more	60	73	65

*There was one teacher only.

3.3.4 Use of the new materials. Table 3 shows the responses of teachers to questions about use of the new materials during the trial period. A majority of teachers responded positively on each item. They almost all answered in the negative (90% in Urdu, 93% in Math/Science, and 87% in Pashto) to a question asking whether anything was missing from the Kachi books that children needed to know.

Table 3: Responses of teachers about the Urdu, Math/Science, Pashto materials

Question	% saying "yes"		
	U	M/S	P
Used the new texts all the time (every day)	93	86	68*
Stories and exercises helped children learn	90	93	95
Used the teaching method in the guide daily	97	100	97*
Objective in guide achieved by most children	84*	100	94
Always stated the objective of the lesson	93	100	97
Enough review so stu. remember previous work	97	100	99
Presentation of new materials easy with guides	100	100	99
Directions clear about helping stu. practice	100	100	100
Enough exercises for "guided practice"		72**	90* 88**
Assignments hold stu. attention working alone	75**	93	88
Most children answer eval. quest. correctly	78*	93*	84*

The method was easy after learning the pattern 78** 81* 68**

The range of responses usually included "yes," "no," "sometimes yes and sometimes no."

* All other responses were "sometimes yes and sometimes no."

** Most others said "sometimes yes and sometimes no."

3.3.5 Teacher ratings of the materials. Teachers were asked to rate specified characteristics of the materials, on a scale from one to four, where "3" was equal to "good" and "4" was equal to "excellent." Table 4 shows their ratings. Again, the overall ratings were high. The lowest scores for each subject were on the question about whether the materials were "related to children's experience." This answer reflected the difficulty of finding common words containing the simple combinations of sounds that are introduced in the early lessons. Words such as "taj" (crown), "but" (statue), "tar" (thread), etc., while useful for practicing alphabetic sounds are not so common to children's experience. It is unclear why the rating is comparatively low in math.

Table 4: Teacher Ratings* of Urdu, Math/Science, Pashto materials

Characteristic	U	% Rating good or excellent	
		M/S	P
Related to child's experience	81	73	68
Suitable to child's age	84	74	76
Interesting to child	97	93	88
Helped child learn skills	91	86	76
Useful to the teacher	94	93	86

* There were 4 ratings: 1=poor 2=fair 3=good 4=excellent

3.3.6 Teacher comparisons of new materials and old materials. Teachers were asked to compare specified characteristics of the new materials with materials they had used before for Kachi classes. They overwhelmingly reported that the new materials were better on all dimensions compared to the materials they had been using before. Table 5 shows these ratings.

Table 5: New Urdu, Math/Science and Pashto materials compared to old materials

Issue	% Rating "better than old"*		
	U	M/S	P

Systematic organization	97	100	96
Interesting to the child	97	100	97
Related to child's experience	97	100	96
Helping child learn	97	100	97
Easy to teach	97	100	97

* There were 3 ratings: 1=not as good as old materials 2=the same as old materials 3=better than old materials

3.4 Findings from end-of-the-year Kachi testing. The sample expanded considerably during later phases of the evaluation. This was because the trial of the first-half-year materials had shown the critical nature of developing the skills of the support supervisors. Since it took several cycles of training, monitoring and assessment in the districts before this system worked well, the IMDC felt it was important to start developing these capacities as soon and as broadly as possible. In the first introduction of materials in each district, IMDC staff set up and carefully nurtured a system of supervision, and identified superior individuals who could lead the training of their colleagues in the districts. During the trial of the last-half-of-the-year Kachi materials, the IMDC staff gradually turned over more training, monitoring and assessment responsibilities to field supervisors until by the second and third phases of the Kachi materials when there were almost 800 classes using the Kachi materials, the IMDC staff were only testing a few schools in each district. The rest were turned over to the supervisors.

By these trials, however, several difficulties were encountered in providing materials to the classrooms in a timely way. The second volumes of the Kachi language books were delayed by several months and in some cases when they were finally delivered to a central point, they were not distributed further. As a result, teachers were unsure of what to do. Some retaught the books they already had been given over and over again, while others reverted to the old books and methods they had used before. Thus by the time the final rounds of testing came, each district had gone through its own unique experience with the materials. The achievement results which appear in ANNEX B show this clearly. Some tehsils, such as Mardan, where the teachers retaught and retaught the first half year materials did exceptionally well, while others, like DIKhan, where a large number of transfer of supervisors and teachers and a delay in receiving materials showed very poor scores. The results of this phase therefore reflect much more the unique combination of difficulties each tehsil faced rather than the success or failure of the materials. Nevertheless, the results show that despite all these difficulties most scores met a reasonable standard.

Table B in ANNEX B shows the class scores of schools in each tehsil on the last test of the Kachi materials (Test 3 in the case of the earlier schools that were given 3 tests in the year, and Test 2 in the case of the later schools who were only tested twice--both tests reflect end-of-year expectations).

Scores are only reported in the classes spot-checked by the IMDC. Because of the small number of IMDC tested cases in each tehsil it is difficult to apply the usual standard of 75 percent or more correct answers by tehsil. Instead the scores are summarized at the provincial level.

Overall 235 classes were tested by the IMDC. The subject results are reported with the percent of classes which met the IMDC standard of 75 percent or more correct answers:

Urdu. The average class score in Urdu was 70 percent. Of the 59 classes tested in Urdu, fewer than half (41 percent) received a class score of 75 correct answers or more. The boys' classes pulled the average down with very few classes (23 percent) meeting the standard compared to girls' classes (79 percent). DIKhan pulled the overall average score down.

Pashto. The average class score in Pashto was 87 percent. Of the 66 IMDC tested classes in Pashto, considerably more than half (73 percent) received a class score of 75 or more. The boys' again pulled the average down (67 percent met the standard) with much lower scores than the girls (83 percent). Mardan had extremely high scores because they were retested.

Math/science. The average class score in math/science was 86 percent. Of the 110 IMDC tested classes in math/science, considerably more than half (85 percent) received a class score of 75 or more correct answers. In math/science, the boys' obtained lower scores (78 percent met the standards) than the girls (98 percent).

4 CONCLUSIONS

All the study objectives were met in the initial tests of the Kachi materials and most were met in the end-of-year tests of materials.

4.1 **Success of program objectives.** All the initial materials and most of the second set of materials met the standards set by the developers. On the three program objectives they were assessed as follows:

- o **Teaching literacy and numeracy skills:** With one exception, the materials (textbooks and annotated teachers' guides) met the standards that more than half the classes in a district or tehsil (or province in the final test), would obtain a class average of 75 percent or higher. The one exception was the second set of Urdu materials, and there the problem could be isolated to the boys' classes in DIKhan where the support system broke down when materials were delayed.
- o **Attractiveness of the materials.** On all counts of being interesting to children, relevant to their experiences, suitable for their ages, etc. teachers gave the initial materials (where the question was asked) in all subject matters a high rate of approval. The responses exceeded the majority of positive answers required to meet the developers' standards.⁸

⁸One should ask however whether by any questionnaire or interview technique, negative answers

- o **Helping the teacher teach effectively.** The indicators that the initial materials helped the teacher teach effectively were all met: a) The majority of the teachers responded positively to a set of questions about the usefulness of the annotated guides. b) More than 80 percent (87 percent in Urdu, 86 percent in Math/Science and 91 percent in Pashto) of children were found to be engaged in learning tasks related to the materials on the number of occasions when an observer monitored the class. c) Children in the main Kachi learning contexts (large classes--over 40 students, and small classes--under 40 students, and single and multiclassses) performed to the IMDC standard on the achievement test in all subjects. Girls also consistently did better than boys which, while cause for inquiry, is perhaps a positive sign, since in BRIDGES studies conducted in higher classes, girls tended to have lower achievement results.

4.2 Results of the additional study objectives:

- o **Teacher training.** The study tested two training packages to determine the minimum training required for teachers to use the materials effectively. There were no essential differences in the scores of students in the classes of T1 (IMDC trained) and T2 (SDEO, ASDEO and LC trained) teachers. Therefore district staff demonstrated that they could effectively train teachers in the use of new materials. As noted above, results may depend more on a system of carefully monitoring teachers through frequent visits and achievement testing than on lengthy or theoretical training.
- o **Support systems.** What became apparent from observations in the classroom in the first testing cycle was the fragility of the support system organized by the IMDC. To sustain long term use of the materials, it will be important to vitalize a system that has been slumbering--where teachers are present but not teaching, where supervisors have little impact on the quality of instruction, where teachers avail themselves of frequent leaves, where, in short, little learning takes place. Thus the Kachi evaluation clearly indicates that in subsequent trials more attention be paid to identifying supports for teachers and providing on-the-job staff training in skills that are needed to sustain the program.

5. RECOMMENDATIONS

The following recommendations suggest ways to improve the systems that support use of the materials (details of modifications required in the materials are found in ANNEX C).

5.1 Expanding the use of experimental materials. The initial trials of the Kachi materials made clear the need for strengthening systems to support instructional improvement. For that reason, it was recommended that the experimental use of the materials be expanded as broadly as possible to a few

will be generated from the teachers. A few teachers carefully registered problems they had with details, but rarely did anyone voice objection to the materials as a whole. The only alternative to suspecting the data is to believe that the materials are an overwhelming success.

schools in each district and major tehsil in NWFP to start the process of building support systems. Without this expansion, much time would be lost in building these systems when materials are ready for dissemination to the entire province.

5.2 Evaluating the new materials in the later testing cycles. With the decision to expand the experimental sample, it was recommended that the evaluation design be simplified to cope with the much larger number of schools. The initial trials of Kachi materials basically validated the methods and approaches used in the materials and, therefore, a simpler evaluation design for the second-half-of-the-year Kachi materials seemed a viable way to proceed. The simplified design emphasized the monitoring of skill development and included fewer evaluation proformas, less confusing test formats, a smaller sample of students from large classes, twice yearly instead of three times yearly testing, etc. These simplifications made it possible for the IMDC to continue to have a role in the evaluation.

5.3 Urdu weaknesses. By the end-of-year testing of the Kachi materials, only one group seemed to be having significant difficulties with skill development in a subject area. That was the boys' classes in Urdu language. Because of the difficulties encountered in the field, and because the poor results tended to be localized in the boys' schools of one district, it was difficult to conclude that this weakness was inherent in the materials or the instructional system supporting the materials. The recommendation, therefore is to strengthen the system that supports the use of Urdu materials in DIKhan so that supervisors can monitor the situation more effectively in their own district.

ANNEX A

Schools Using Kachi Materials--February 1994

Table A: Schools using Kachi materials by February 1994

Tehsil	Schools	Math/Sc.	Urdu	Pashto		
Abbottabad	Boys 14	29	29	--		Girls 14
Bannu	Boys Girls	42	42	--	20	20 --
Battagram	Boys Girls	9	9	--	2	2 --
Buner (Daggar)	Boys Girls		24	--	10	10 24
Chitral	Boys Girls			21	21	--
		8	8	--		
Chitral (Mastooj)	Boys Girls			12	12	--
		--	--	--		
D.I. Khan	Boys Girls	20	20	--		
		8	8	--		
D.I.Khan (Kulachi)	Boys Girls	5	5	--	4	4 --
Dir (Timargara)	Boys Girls		48		48	48
		8	8	8		
Haripur	Boys Girls	18	18	--	6	6 --
Karak	Boys Girls	23		23	--	8 --
				8	8	--
Karak (Banda D.S)	Boys Girls	4	4	--	--	--
				--	--	--

Kohat	Boys	24	24	--		
	Girls		8		8	--
Kohat (Hangu)	Boys		6		6	--
	Girls	4	4	--		
Kohistan (Dasu)	Boys		8		8	--
	Girls		2		2	--
Kohistan (Pattan)	Boys		8		8	--
	Girls		2		2	--
Lakki	Boys	36	36	--		
	Girls			4	4	--
Malakand (Sama Rani.)	Boys		5		--	--
	Girls			--	--	--
Malakand (Swat Rani.)	Boys		5		--	--
	Girls		4		--	--
Mansehra	Boys	38	38	--		
	Girls		8		8	--
Mansehra (Balakot)	Boys		16		16	--
	Girls	--	--	--		
Mardan	Boys	36	--	36		
	Girls			14	--	14
Mardan (Takht Bai)	Boys		8		--	8
	Girls	4		--	4	
Nowshera	Boys	26	26	26		
	Girls			6	6	6
Peshawar	Boys	37	37	37		
	Girls			7	7	7
Swabi	Boys	17	17	17		
	Girls		6		6	6
Swabi	Boys		4		4	4

(Lahore)	Girls			4		4		4
Swat		Boys				43		43
(Saidu Sh.)	Girls		14			14		14
Swat		Boys				12		12
(Alpuri)	Girls		8	8		8		12
Tank		Boys				8		8
	Girls		3	3		--		--
<hr/>								
Totals			778	668		336		

ANNEX B**Final Kachi Results**

Table B: Results on final Kachi tests (administered by IMDC)

Tehsil	Schools	Math/Sc.	Urdu	Pashto
Bannu	Boys			
	Nawaz Abad	88	82	--
	Bannu City No.6	88	70	--
	Imaro Mandan	88	62	--
	Girls			
	Naseem Gul Baist Khel	98	99	--
	Feroz Darma Khel	--	91	--
	Koti Saddat	98	82	--
Buner	Boys			
	Hissar		98	--
	Toop Dara		97	--
	Khel		99	--
	()		100	--
	Shennai		98	--
	Legannai		97	--
	Battai No. 2		87	--
	Pera Abai		96	--
	Char		97	--
Malik Poor		95	--	--
	Beshonai		98	--
	Girls			
	Ghaze Khanay		84	--
	Sultan Wass		95	--
	Malik Poor		90	--
	Jour		86	--
D.I. Khan	Boys			
	Sher Abad		57	--

	Bodiani		46	--	--	
	Himat Wala		49	--	--	
	Bhora Shah		89	--	--	
	Shorkot		53	--	--	
	DIKhan No. 2		36	--	--	
	Basti Tareen	18		--	--	
	DIKhan No. 1		45	--	--	
	Chah Pepal Wala		73	--	--	
	Hossa			77	--	--
	Taheem Abad			66	--	--
Muryali	--	72	--			
DI Khan No.7	--	72	--			
DI Khan No.5	--	65	--			
Nawab	--	63	--			
DI Khan No.3	--	55	--			
Cha Peapal	--	49	--			
DI Khan No.3	--	48	--			
DI Khan No.5	--	45	--			
Marhalli	--	45	--			
DI Khan No.10	--	39	--			
Nadir Ali Shah	--	37	--			
Kulachi No.4	--	17	--			

Girls

	Qazian Walla		99	--	--	
	K.Ali Zai		97	--	--	
	Dawala			98	--	--
Mohallah Noor Narian	--	85	--			
Khawani	--	81	--			
Rata Kolachi	--	80	--			
Hafaz Sumandar Khan	--	76	--			
Hafaz Sumandar Khan	--	50	--			

D.I.Khan Boys
(Kulachi)

	Behlol Khel		91	--	--	
	Qasim Abad		97	--	--	
Kulachi No.4	--	73	--			
Kulachi No.1	--	65	--			
Kulachi No.2	--	60	--			
Kulachi No.3	--	59	--			
Kulachi No.4	--	31	--			

Girls

	Kulachi No.1	76	--	--
	Kulachi No.1	88	--	--
Kulachi	-- 68	--		
Hatala	-- 48	--		

Dir Boys

Shogokas	90	--	--
Adam Dehri	--	--	94
Tari	--	--	70

Girls

Ouch Sharki	71	--	61
-------------	----	----	----

Haripur Boys

Haripur City No.2	--	78	--
Sarai Salih		88	-- --
Bajida Haripur		66	-- --
Sector No. 3		63	-- --

Girls

Haripur City No.1	--	97	--
Haripur Monan	--	95	--
Haripur City	--	93	-- Talokar 90 --
	--		
Sarai Salih		92	-- --
Pandak			90 -- --

Karak Boys

Mita Wala		93	-- --
Takhate Nusrati	--	92	--
Dubli Laghar	--	81	--
Inzar Banda	--	79	--
Kharo Banda	--	72	--
Tapi Karak	--	70	--
Lakri	--	63	--
Mitha Khel	--	62	--
Toor Dand	--	52	--

Karak	--	42	--				
	Bari Khawar			96	--	--	
	Karak City			95	--	--	
	Town Committee			97	--	--	
	Mir Watan			76	--	--	
	Fateh		95		--	--	
	Yaghi Ghulam Khel	97			--	--	
	Chokara			98	--	--	
	Kashmiri			92	--	--	
	Ambiri Qilla	82			--	--	
	Ahmad				75	--	--
	Tanga Zani	52			--	--	
	Mirza Khel			92	--	--	
	()	86	--		--	--	
	Girls						
	Rahman Abad		86		--	--	
	Adda Karak	--	94	--			
	Officers Colony	--	80	--			
	Chokara			93	--	--	
	Ahmad				82	--	--
	Warana Mir Hassan Khel	85			--	--	
Karak	Boys						
(DBShah)							
	Tari			98	--	--	
	Khari Banda			95	--	--	
Kohat	Boys						
	Zara Mella	--	66	--			
	Tangi Banda	--	41	--			
	Girls						
	Mahalla Sikander	100	--	--			
	Jangal Khel	100	--	--			
	Sheno Khel	99	--	--			
Kohistan	Boys						
(Dasu)							
Jalkot	--	96	--				
	Bazar Ranwala			66	--	--	

	Gijal		39	--	--
	Girls				
	Dasu		82	--	--
Lakki	Boys				
	Dabak Mandra Khel	--	100	--	
	Haqdar Abad	99	--	--	
	Girls				
	Mena Khel Lakki	--	100	--	
	Dalo Khel	--	85	--	
	Lakki Khudaidad Khel	98	--	--	
	Railway Junction	96	--	--	
Mansehra	Boys				
	Lohar Banda	--	95	--	
	Chitti Dehri	--	38	--	
	Sarwar Abad	71	--	--	
	()			100	--
	Girls				
	Lohar Banda	--	70	--	
	Mansehra No.2	89	--	--	
Mardan	Boys				
	Hoti Mardan	--	--	100	
	Noor Men Khel	--	--	100	
	Babane	--	--	100	
	Mardan No.1	--	--	99	
	Sheriq Hoti	--	--	99	
	Sekandari Koruna	--	--	99	
	Bughdada No.1	--	--	99	
	Bughdada No.2	--	--	99	
	Kochi Abad	--	--	99	
	Khani Koti	--	--	98	
	Khan Mian Killi	--	--	97	
	Sheikh Yousaf	--	--	97	

Ibrahim Khan Killi	--	--	97
Mohib Banda No.2	--	--	96
Noshad Abad	--	--	96
Mardan No.1	--	--	95
Purana Hoti	--	--	94
Par Hoti No.1	--	--	92
Jan Abad	--	--	91
Bughdada No.2	--	--	91
Mangel Bagh	--	--	91
Fatma	--	--	90
Chil Banda	--	--	86
Aslam Koruna	--	--	80
Faqir Ban	--	--	74
Subedar Killi	--	--	68
Bakat Ganje No.1	--	--	60
Bakat Ganje No.2	--	--	51
Beland Khel	--	--	50

Girls

Bughdada No.2	--	--	100
Hoti No.2 Mardan	--	--	100
Labour Colony	--	--	100
Mardan No.2	--	--	100
Bejli Char	--	--	100
Beket Gunje	--	--	100
Mardan No.2	--	--	100
Shahdand	--	--	100
Mardan	--	--	100
Nala Par Hoti	--	--	100
Hoti No.2 Mardan	--	--	98
Sikandari Koruna	--	--	98
Azzi Khel	--	--	97
Bagh Irram	--	--	96
Bekat Gunje	--	--	95
Hoti No.1 Mardan	--	--	87

Mardan
(Takht Bhai) Boys

Noor Badshah Banda	--	--	95
Noor Badshah Banda	--	--	94
Ward No.4 Takht Bhai	--	--	90
Kalpani Takht Bhai	--	--	72
Moolyanu Killi	--	--	60

Nauroz Abad	--	--	51
Jalala No.1	--	--	40
Zareen Abad	--	--	33
Jamra	--	--	17

Girls

Takht Bhai No.2	--	--	100
Ward No.4 Takht Bhai	--	--	100
Town Committee	--	--	100
Ward No.1 Takht Bhai	--	--	99

Swabi Boys
(Swabi)

Swabi No. 1		97	--	--
Loqman Deheri		91	--	--
Sher Ali Koroona		95	--	--
Kalabet		99	--	--
Kalabet No.2	96		--	--
Baker			96	--
Topi No. 5		90	--	--
Baja		95	--	--
Baja, No.1		97	--	--

Girls

Akber Abad		96	--	--
Gar Shagi		95	--	--
Shahmansoor No. 3	88		--	--

Swabi Boys
(Lahore)

Haji Abad		92	--	--
Ambar No. 1	82	--	--	--
Girls				
Ambar			96	--
Kunda			96	--

Swat Boys
(Saidu Sh.)

Kohistan Gut	--	--	52
Marghozar	--	--	32
Cheel Shagai	79	--	--

2x1

Galli Gram 78 -- --

Girls

Mohd Gul Shaheed 97 -- 69
Banar 95 -- 52
Afsar Abad -- -- 45

Swat Girls
(Alpurai)

() 78 -- --
() 87 -- --
() 100 -- --
() 97 -- --

Tank Boys

Tank No.1 -- 80 --
Kot Kat -- 59 --
Ghari Balooch -- 39 --
Shah Alam -- 20 --

Tank 93 -- --
Kote Wali 86 -- --
Ranwal 92 -- -- --
Ghulum Korai 96 -- -- --

Girls

Ghari Balooch -- 79 --

Tank No. 1 88 -- --
Tank No. 2 86 -- --
Gul Imam 90 -- --
() 85 -- --

ANNEX C**INITIAL TESTING CYCLE****RECOMMENDATIONS FOR IMPROVEMENTS IN KACHI MATERIALS**

Materials. The following are the main deficiencies discovered in the textbooks, guides and tests. Overall, the problems in the textbook and guides were minor; the methods used in both appear to be validated by the high degree of learning. Below are suggestions for improvements. More details appear in the "unit by unit" reports provided to the IMDC.

Urdu and Pashto

- o Several words were confusing (baba and mama, for example) or were not within the usual range of children's experience (statue and crown). However since there are limited numbers of words that illustrate the first alphabetic letters introduced to the children, it may be necessary to use a few words that are not part of the common vocabulary. Writers will have to balance relevance with expediency in selecting vocabulary.

- o Teachers need more training in sounding letters and connecting sounds. Even some of the best had difficulty.

- o The test items with the lowest and highest average correct answers followed a pattern that related more to test placement than content: highest scores were at the top and bottom of the page and lowest scores toward the center of the page. This suggests that a better test be constructed.

- o Annotated guides should suggest ways the teachers can extend the practice in each lesson (limits on page numbers mean that more exercises cannot be included in the text). For example, a writing exercise might include asking the children to trace letters in their books with their fingers, then in the air, then with pencil in the book, and finally independently on their takhtis or slates.

Math/Science

- o The lowest scores on test items were those where children were asked to match "squares" and "rectangles." These questions were adjacent, and the pictures were drawn with a perspective that made their shapes confusing. These items should be separated on tests and the "distractor" should be a triangle or circle to avoid confusion.

- o In questions about color, children should be asked to identify one rather than two items of the same color.

- o The children who had been taught units on pattern, "larger than," "longer than," and "heavier than," all did well on these parts. However they had some difficulty in determining the next

in a sequence of objects when the objects were human beings ("boy, girl, boy...."). This appears also to be difficult for teachers.

Testing. Testing will more accurately reflect student learning if, in the future, a) tests are written more carefully to avoid confusion b) 20% samples from each class are taken by selecting every nth student from the register, and c) students are asked to do the test one on one with an interviewer.

Training. The following are suggestions for improving supervision and training so that teachers will use the materials more effectively

- o Teachers need motivation to keep working with the new materials. Frequent tests, monitoring, and feedback by local staff and by staff from outside the district helps to motivate them.
- o Teachers tend not to read the annotated guides. An element of the training should include reading several annotated lessons together out loud and then practically applying them.
- o Because the text includes limited numbers of pages, and for the convenience of teachers who may teach more than one class, training should include ways to extend the exercises in each lesson (see under Urdu above)
- o Teachers need specific instruction in the management of large and multi-classes to supplement practical training in the materials themselves. The training should give practical examples of how the materials can be adapted to these contexts.

Supporting the use of new materials. The materials for each subject and class level are currently being tried, first, on an experimental basis and later, after modification, in an expanded sample to more schools either in the same district or to other districts. From the first experiences with this process, the following are suggested:

First experiments with the new materials

- o IMDC staff should train district staff and a small group of teachers (as a demonstration model) in the first uses of the materials.
- o District staff should then train a comparable group of other teachers within the next few days of the initial training.
- o Formative evaluation conducted of these first efforts should use the already tested Forms 1 (teacher characteristics), Form 3 (supervisors' observations), a modified Form 4 (final interview) and achievement tests improved according to the details in Appendix B. Form 2 which solicited teacher comments on each unit should be dropped and relevant questions added to Form 4. IMDC staff should conduct final interviews and administer or supervise the administration of achievement

testing.

- o Achievement testing should be conducted periodically on a 20% sample of each participating teacher's students, selected by an unbiased process. This will cut down the time required for testing. Later followup testing of weaker classes can be conducted by district staff under the supervision of one or two IMDC staff.

Expanding the use of tested materials

- o A select group of trainers (perhaps 4-6 ASDEOs or LCs) from a region having experience in the materials should spend a week at the IMDC in refresher training on the use of the new materials. There they would learn how to teach generic teaching skills. At the IMDC, they would develop an outline for how they will train teachers in the new materials.

- o These trainers will expand the use of the tested materials to other schools within their own districts and will help 1 or 2 IMDC staff extend the use of new materials to nearby districts.

- o Evaluation of this expansion of the materials (no longer experimental) will consist of frequent supervisory visits using a general "teacher performance proforma" (TPP) and achievement testing three times a year in the first year, and later diminishing to semi-annually or annually as required to keep teacher motivation strong. One or two of the IMDC training staff will supervise the testing which will be carried out by ASDEOs and supervised by SDEOs and ADEOs (academic).

ANNEX D**OBSERVATIONS AND RECOMMENDATIONS FOR
THE TESTING OF NEW MATERIALS**

The testing of IMDC Materials had several purposes: to monitor the teacher's use of the materials, to see if children could learn skills by using the materials and, perhaps most important, to demonstrate to teachers what is important for the children to learn. The hope was that the testing would cause the teachers "to teach to the test."

Overall, the first testing experience went exceedingly well, given the newness of the experience to all involved: developers, teachers, students, SDEOs, ASDEOs and LCs. The children exhibited a high degree of learning in all classes where teachers conscientiously used the new materials. Test scores were lower where teachers were not as diligent. Most test items were accomplished with a high degree of success. A few (which are noted below) showed some degree of difficulty, usually because of a fault in the test item rather than in the skills of the children.

The second round of testing can be expected to produce even higher test scores, if lessons learned in the first round of testing are heeded. Below are some of the difficulties observed during the first round of testing, and suggested improvements.

1 Tests:**1.1 Confusing test format and expectations:**

1.1.1 **Inexperience.** Children were inexperienced in the test format even though they had practiced connecting letters or words with objects in their books. They were not used to circling correct answers and seemed to have difficulty connecting pictures and words with a line.

Recommendation: Achievement tests need to be modelled more closely on the book tests; if the book tests are not now appropriate, perhaps they can be modified to make a format that works also for the achievement test. The other alternative would be to give the children longer practice in the techniques of answering before they begin the test.

1.1.2 **Connecting outside test item.** Children frequently looked for connections between words in one test item and pictures in different test items, or tidy children tried to connect all the words and sentences arbitrarily to something further down the page so that everything would be connected.

Recommendation: Draw boxes around the test items and their possible answers and emphasize to children that they should only select one written item within the box.

1.2 **Confusing test items** (starring next to the item number means comparatively low test results):

1.2.1 **Difficult discriminations.**

-Children had difficulty knowing whether the pictures in the test of an old man, or a middle-aged man should be connected to the word "baba" (old man) or "mama" (uncle) (U #6*,#7*)(P #5*)

Recommendation: These two concepts should not be included in the same test item or the tester should tell the children whether the picture is meant to represent an old man or an uncle.

-Test writers should be aware that Pashto does not discriminate the colors blue and green; on this test, however, the children did not seem to have difficulty with this discrimination (M/S #4)

Recommendation: Test writers should be sure they want children to make these fine discriminations if they include them together in test items; otherwise they should avoid using them in the same question.

-Photocopying does not distinguish yellow/orange/red clearly enough for children to make accurate discriminations (M/S #3, #5*).

Recommendation: Avoid using these colors in the same test item.

-Concepts that are difficult to distinguish "interfere" with one another when placed in the same test item. "Square" and "rectangle" distinctions are an example of this interference (M/S #9*,#10*)

Recommendation: Test items should not include these items together or if included together testers should be aware that the discrimination is a "fine" one of a different order than most test items.

1.2.2 **Difficult to understand pictures.**

-Some pictures were difficult to identify in the Pashto test, In particular one of the pictures was supposed to be a statue, and children were to say whether the statue was "broken" or "not broken," details that were difficult to "see" from the picture (P #4, #7*).

Recommendation: Field test the pictures carefully to ensure that they can be identified. Where possible use pictures that children are familiar with from their textbooks.

1.2.3 **Asking for more than one skill at a time.**

-In most of the Urdu and Pashto items, children were asked to exhibit several skills in a single test item (comprehension, decoding, and identification of symbols). If they made a mistake, it was not possible to know which skill or skills was deficient.

Recommendation: Try to isolate the skills being tested and test one at a time.

1.2.4 **Patterns.** Children had difficulty with the first math/science pattern question that involved human figures (M/S #14*). In general, adults have difficulties recognizing patterns and therefore it is likely that the teachers may not understand this concept fully.

Recommendation: Training should emphasize drilling patterns.

2. Organization of the testing procedure

2.1 **Difficulties in testing very large classes.** In classes of 60 or more children, it often took up to an hour before children's names were written on the tests, their attendance recorded, tests given out, pencils sharpened, and the correct page of the test turned to. The test itself usually took about 15 minutes.

Recommendation: A twenty percent sample would speed up the time required and the accuracy of the results. The sample would be selected from the register by any randomization technique that does not create bias, and students might be given the tests as a group or individually (to ensure that they understand each test item). The highest number of students tested in a class would then be no more than 20 (few classes contain more than 100 students).

3. General observations:

3.1 **Large classes.** The difficulties of organizing the testing and the generally lower results in very large classes of over 60 students illustrate the almost impossible situation of such large classes. Teachers cannot monitor or provide feedback to so many children. The materials worked in multi-classes but were less successful in classes of over 60 children. Just the act of handing the books out to their owners on normal school days must take up large amounts of instructional time.

Recommendation: Officials need to solve the problem of large Kachi classes (almost always in urban areas) by sanctioning more teachers as policy allows so that there are no classes of more than 40 students. Similarly, teachers need training in how to manage large numbers of students. Materials cannot compensate for the difficult conditions in such large classes.

3.2 **Children exhibit lack of confidence.** Teachers are not yet aware of how to develop confidence in the students. Many students automatically look to other children for the answers, and children are frequently so jammed together that they find it easy to look at each other's papers.

Recommendation: Teachers need generic training in how to reinforce learning through positive feedback and making children feel successful in what they do. Smiling faces for good work, taught during the trials of the materials, were very popular with the children.

3.3 **Using government books.** When teachers use the government Qaida (alphabet book) it is

obvious from the children's responses "naming" rather than "sounding" the letter. Use of this book with the new materials confuses the children.

Recommendation: Training should emphasize and ASDEOs/LCs should reinforce the prohibition against using the Qaida at the same time as the new materials.

3.4 Sounding alphabet letters. Teachers, ASDEOs, and LCs often have difficulty themselves in sounding and connecting letters and make mistakes the children copy.

Recommendation: Training needs to include more practice in sounding and connecting letters.

ANNEX E

RECOMMENDATIONS FOR TEACHER TRAINING

TO SUPPORT THE NEW MATERIALS

All teachers need training in:

- o Effective practices
- o Awareness of time as an instructional resource and the importance of time-on-task and engagement as aspects of time as an educational resource.
- o The specific use of the new materials including the drilling of the generic teaching pattern that accompanies each lesson.
- o How rules for respect behaviors and conduct can be taught to children to maintain an orderly environment in the classroom without physical or verbal abuse. The custom of having the children stand up every time they are called upon is an example of a respect behavior that also seems a good way to give children exercise in cramped spaces.

Teachers of large classes need training in:

- o Management of classroom space and numbers of children, specifically:

Seating children with aisles so movement is possible without stepping on children

Assigning student assistants to hand out books and pencils and sharpen pencils (4 assistants might collect or disperse to their own assigned sections of rooms)

Assigning numbers to children when their names are similar: Muhammad#1, Muhammad#2, etc. so there is less confusion in roll calls

Removal of extraneous furnishings (mainly student desks and chairs); children can use satchels or wooden takhtis as flat surfaces to write on.

- o Improving learning, specifically:

Identifying weaker children and placing them near the front of the class where they automatically get more attention

Pairing weaker children with academically stronger children who can help them (but be careful of developing too great a dependence on the stronger children--children also need to learn how to be good teachers).

Concentrating a larger share of feedback reaction on these weaker children.

Asking children to respond mostly as a group to questions, or in repetitions. This keeps more of them alert and the repetition helps the slower children learn by letting them hear correct responses again and again.

o Reorganizing classes in the school as a whole by:

Combining smaller, higher classes to free a teacher for a second section of Kachi. Older children can do independent work more easily and therefore can be taught more easily as multi-classes.

Seating classes in ways that they make a minimum of noise to distract one another, but allow for ventilation from more than one direction (i.e. so windows and doors do not need to be shut because of noise)

Teachers of multiclassses need training in:

o General knowledge about multiclassses, specifically that:

Multi-classes do not necessarily lead to an inferior learning experience.

Statistically, the more classes a teacher teaches in NWFP the fewer children he/she will be teaching as a whole.

Time is the most critical resource in multi-classes. If used effectively so children are engaged in learning tasks almost all of the time they can learn as much as single classes.

o Managing space

Children can be seated in numerous ways that make it easier for teachers to teach: in different spaces/classrooms, by class rows, by class groupings, by ability groups, facing opposite directions and focused on different blackboards, etc.

o Improving learning, by:

Pairing older or smarter children with younger or slower children to listen to lessons, and prepare children for presentations in front of the teacher.

learning how to elaborate the book lessons with more exercises children can do on their own while the teacher is engaged with other classes.

o Reorganizing classes in schools overall so:

The best learning conditions can be created. If considerably older children are paired with younger children, they can help the younger children and may be able to do more work on their own as a result of better skill levels. If children of adjacent classes are combined, there may be more peripheral learning that goes on for both classes.

Younger children need more attention than older children and therefore lower classes need to be combined with other classes in ways that allow the teacher/peer tutor to spend more time directly teaching them.