Female Teachers and Teaching in Botswana Classrooms

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SUMMARY

Background

In 1988, the Government of Botswana and USAID began to study life inside classrooms. This work was broadened in 1990 -- with encouragement from USAID's Women in Development office -- to focus on female teachers and their pedagogical practices.* Girls outperform boys in Botswana's school system until junior secondary school. At this point, female enrollments fall below 50% of total enrollment. Girls' national exam performance also falls below that of boys at the end of junior secondary school. Until this study was commissioned -- by USAID offices in Botswana and Washington -- very little was known about why these gender inequities appear.

This draft report summarizes initial findings from a study of 310 **teachers**: their background characteristics and their teaching practices. In addition, modest data also have been collected on the classroom activities of male and female **pupils**. This paper (a) reports on gender differences in the attributes of teachers, and (b) asks what the curricular areas are taught by females, and how they teach, differs from the specialties and pedagogical practices of male teachers. These two bundles of factors may help to explain why girls' school performance dips below boys' achievement levels.

Key Findings

- Female teachers are disproportionately allocated to Setswana and Art classes while male teachers are more likely teaching in Social Studies, Math, Technology, English, and Science.

- Junior secondary school teachers are quite young, with 85% of them under age of 30. Female job tenure averages just 3.9 years and 4.6 years for males. This is due largely to the fact that the junior secondary school system has expanded rapidly over the past decade.

- Female teachers come from more affluent (or less poor) households. When asking if their childhood house had electricity and a thatched roof, the African female teachers are consistently better off than male teachers.

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* The larger research and evaluation project -- the Botswana Teacher, Classroom, and Achievement (BTCA) study -- is currently directed by Shirley Burchfield, David Chapman, and Philemon Ramatsui. This effort is supported by USAID/Botswana and the USAID Education Office (Research and Development Bureau) in Washington. Florida State University provides back-up support through the IEES project.

- Among Africans (excluding expatriates), female teachers holding a diploma or above are receiving higher salaries than male teachers.

- Male teachers are, on average, given more "attention" than their female counterparts. 72% of male teachers versus 57% of female teachers were provided houses by schools; 53% of male teachers versus 31% of female teachers were visited by school headmasters at least once in the past year.

- Pupils in classrooms taught by females tend to use a fewer number of instructional materials per observation segment (3.1), compared to children within classes led by male teachers (3.6).

- Female teachers tend to be more verbal in the classroom, with 78% of class time spent talking at children or engaging in choral recitation, versus 73% for male teachers. Male teachers spend more time monitoring students as they perform written exercises (22%) for males versus (16%) for females.

- Female teachers, on average, asked more closed-ended questions (6.3) over the observation segment (10 minutes in length) than male teachers (5.4).

Overall, gender differences do exist but only to a moderate degree in social status, school treatment, salary level and job tenure. In terms of teaching behaviors, gender differences remain. However, both female and male teachers exhibited a simple pedagogical routine, relying heavily on lecture and oral recitation in Botswana classrooms. A small number of instructional tools were utilized by most teachers. Very few questions were asked of individual pupils.

Introduction

Girls school performance is in part influenced by the pedagogical practices of their teachers. This study focuses on two facets of this complex issues. First, how do female **teachers** differ from their male colleagues? Second, are female **pupils** treated differently in the classroom? Whether these gender differences explain inequities in actual **achievement** is the subject of future work (not covered here).

It is believed that teachers' pedagogical behaviors are crucial components for students' learning in school environment, mainly in classrooms. Teaching behaviors differ in terms of teaching materials used, instructional methodology, and classroom organization. Considerable resources were spent through preservice training, professional enhancement, and educational policies (for review: Dunkin 1987; Rowan 1990). "Better" trained teachers are therefore expected to be more skillful in managing classroom teaching, learning, and producing more "fruitful" products. Better financed schools leading to better equipped classrooms are expected to have better behaviors. This process needs constant reevaluation at different times and different locations. Do these hypotheses hold if we separate out teachers by their gender, ethnic and training background, social-economic status, and the subjects they teach?

Empirical studies of teacher behavior in North American settings show that many teachers display uniform and simple pedagogical routines, reinforcing passive social roles for students. How is it if we look at African male and female teachers separately? If similar patterns are followed, how should we interpret the phenomenon? How should we describe and evaluate teachers' behaviors in Botswana classroom? What are some of characteristics that we might draw from our research study that can make us better understand "classroom environment"? Do (vertical) bureaucratic controls and (horizontal) professional training by central agencies really influence teachers' behaviors in classroom? These are some of the questions that will be dealt with in this report.

My analysis of gender differences in teachers and teaching practices draws on classroom data collected for the larger Botswana Teacher, Classroom, Achievement (BTCA) study. The main focus of the report will be on teachers' behaviors in Botswana classrooms and to describe gender possible differences. This is one first step toward understanding how girls experience junior secondary school and why their performance falls below boys' achievement.

The BTCA Study

The study of Botswana Teachers, Classroom and Achievement study provided us

with sources that could be compared to studies of the North American settings. The comparison may lead us to think about conceptual understanding of classroom behaviors and performances across cultural boundaries. The study of teacher behavior and the classroom's social rules in Botswana was initiated in 1988. Snyder and Fuller piloted a classroom observation instrument with 154 junior secondary school teachers in Botswana, adapting Jane Stallings' observational tool (see Fuller and Snyder 1991; Stallings and Freiberg 1991, for details). Appendix I includes the classroom observation instrument. They also field tested a teacher questionnaire which inquires about social class and educational background, beliefs about formal schooling and classroom structure, and levels of motivation. In 1989, the full study was begun, sampling 310 Botswana teachers for observation, working in 44 junior secondary schools spread out in 34 villages.

Teacher sample. In each of 44 junior secondary school, about seven teachers were selected from Form 1 and Form 2 (equal to grades 8 and 9 in U.S. terms). For each school, the seven-teacher sample included a Setswana, English, mathematics, social studies, science, and art. Setswana is the national language, spoken by the dominant Tswana tribe. English, however, is the language of instruction for all other subjects. Each selected teacher was observed during at least two 40-minute class periods over one week. In addition, each participating teacher was asked to complete a questionnaire which covered background information. The final sample with complete data includes 244 teachers. Forty percent (40%) are female teachers. Twenty-six percent (26%) are non-African expatriates. Ninety percent (90%) of the African teachers are native Botswanans.

The Botswana research team chose behavioral items that involved low levels of inference on the part of trained research assistants (University of Botswana students). Data reported in this fashion stem from five segments of the observation instrument. The observer, during the first ten-minute segment, records basic information about the number of children in classroom, the subject being taught, and the visible supply of basic instructional materials: textbooks, exercise books, pencils, a chalkboard. Segment 2, running for seven minutes, includes a two-dimensional matrix in which the researcher checks the observed teacher behaviors and what, if any, instructional tool is being utilized (e.g., teacher lecturing at children, working from a textbook). This matrix is repeated over the seven-minute segment 3, for a cluster of four pupils randomly selected by the observer, checking the dominant behavior and which tools students are employing. Segment 4, covering the next ten minutes, requires the observer to tally the frequency and type of questions being asked of the entire class or individual pupil. Segment 5, completed during the final five minutes, asks the observer to estimate how the teacher spent class time, percent of teacher talk in English or Setswana, and additional summary items.

Analysis Design

Outcome Variables. The first question we ask of the classroom institution: What are the typical pedagogical scripts that teachers follow? Second, how much variation in teacher behavior is observed on either side of average levels? Third, can individual or contextual factors explain significant portions of this variance? We report on normative levels and variation in teacher behavior for the following areas: (1) The simplicity or complexity of instructional tools mobilized by teachers, (2) task demands placed on pupils by the teacher, especially the frequency of active reading and writing exercises, (3) the frequency and complexity of questions put to students by the teacher, (4) the consistency of the teacher's "pedagogical technology" over time, and (5) typical ways in which instructional time is utilized, particularly dominant types of actions exhibited by the teacher during a class period.

These particular dimensions of teaching behavior and classroom social structure focus on the level of task complexity, as well as the vertical character of authority and activity which is structured by the teacher. At least within Euroamerican settings, pupil achievement is higher when teachers infuse tasks and cognitive demands with moderate levels of complexity and actively involve students in the subject matter (for review, Anderson and Burns 1988; Carlsen 1991; Walberg 1991). We will see that teachers in Botswana often reduce complexity and act to maintain their strong central authority in the classroom. Such routine scripts, however, do vary significantly across teachers.

Explanatory variables. The major explanatory contextual variables that were hypothesized to relate to the outcome variables are grouped as background: gender, ethnic, qualification, family and income status; teacher's curricular role (grade level and subject-matter being taught); level of preservice teacher training, and length of tenure. These chosen variables are intended to measure and evaluate how educational policies might be implemented and how that implementation affect the teachers' behavior in classrooms. We hope that the findings could help us identify what, if any, that comes from central agencies, makes difference. There are other groups of predictive variables as efficacy, beliefs, competence, self-perceptions, and incentives that are not included much in this report will be used for analyses of effectiveness of teachers' effectiveness in relation to the students' achievement[1].

1 We are expecting the arrival of achievement data in near future. Further relational study and analysis will then be launched to evaluate the effectiveness of particular teaching behaviors on female and male achievement.

The technical step of building data set structure and the step for analysis construction are presented in a diagram (See Appendix II). The complete data set is available on diskette (SAS systems file or ASCII format).

Descriptive Findings

The Botswana setting allows us to study whether gender difference is related to variation of teachers behaviors; whether teachers who differ dramatically in their ethnic and social-class background actually exhibit differing behaviors in the classroom institutions; whether teachers are "managed" differently by school officials or state officials. Of our final sample of 244 teachers (observed twice and with complete data), 40% of the final sample were females. Teaching is one of the few wage-sector jobs available to young women. Figure 1 shows us that female teachers are disproportionately allocated to Setswana and Art classes while male teachers are more likely teaching in Social Studies, Math, Technology, English, and Science. As we find that the ratio of female teachers is relatively high at the secondary education level, compared with many other developing countries, we wonder if the higher ratio of female teachers might be correlated to the fact of higher female student enrollment in Botswana recent years.[2] Note that Setswana is the one of the few areas in which girls still outperform boys on the junior certificate exam. This remains a question. However, we should note that junior secondary school teachers are quite young, with 85% of them under age of 30. Female job tenure averages just 3.9 years, 4.6 years for males. This is due largely to the fact that the junior secondary school system has expanded rapidly only during the past decade. Preservice training levels are similar with 88% of the females holding at least a diploma from a (two year) teacher training college, 87% for males. Females more commonly teach English and Setswana subjects; males are slightly over represented, but not dramatically so, among the ranks of mathematics and social studies teachers (See Figure 1, 2, Table 1).

Teacher background and subject specialties. In Table 1, we report basic characteristics of teachers included in our sample. Descriptive statistics are split by teacher gender, African versus expatriate teachers, and mathematics versus social studies teachers (the latter two subjects chosen for illustrative purposes).

Female teachers come from more affluent (or less poor) households, although the mean differences are not statistically significant controlling for ethnic background.

[2] World Bank 1991 report shows that at secondary education level in Botswana, in every 100 male student, there are 103 female students. (World Bank Report 1991, p267)

Examining two particular variables (Figure 7 and Figure 8: Electricity and Thatched Roof in teachers' childhood house), we found that female teachers are consistently better off than male teachers in terms of their social class background. We also noted that among Africans, female teachers who have a diploma or above are receiving higher salary than male teachers (Figure 28). This may be the fact that more females are teaching multiple subjects therefore more classes (Figure 5).

We found that female teachers were treated differently in schools (Figure 27). Overall, male teachers are given more "attention" to in all 44 schools. 72% of male teachers versus 57% of female teachers were provided houses by schools; 53% of male teachers versus 31% of female teachers were visited by school headmasters at least once in the past year.

Expatriate teachers predictably differ from African teachers. It is not surprising to find that there is a significant difference in educational background between African teachers and expatriates (Figure 4). Salary levels are similar, since the bulk of expatriate teachers are either young volunteers receiving stipends or Botswana residents who have gone on to the civil service pay schedule. 26% were non-African expatriates, reflecting the governments' continued reliance on the Peace Corps, British and Scandinavian volunteers to serve as secondary school teachers. If the school and classroom institution acts to swamp individual differences and to homogenized pedagogical behaviors, this sharp variation in teacher background would be moderated. By subjects being taught, African teachers are more concentrated in Setswana, Math, and Social Studies, while expatriates teach in Science and English (as Figure 3 indicates).

We will report on how math teachers behave quite differently and organize their classes in ways which depart from those of teachers working in other subjects. But the individuals backgrounds of math teachers are not distinct from all other teachers. The comparison in Table 1 is with social studies teachers. But similarities in social class background, tenure, and salary are also observed among teachers in other subject areas. We did find, however, that the observed presence of textbooks was higher in math classes .85 books per pupil, compared to .76 for all other types of classes (statistically significant at $p < .01$). Math teachers also earn more money, with annual salaries running 10% higher ($p < .05$).

Similarities and differences in pedagogical behavior. In Table 2 we report on selected teacher and pupil behaviors for the same teacher categories. Pupils in classrooms taught by females tended to use a fewer number of instructional materials per observation segment (3.1), compared to children within classes led by male teachers (3.6) (Figure 11). This difference approaches statistical difference ($t = 1.81$, $p < .07$). Female teachers tend to be more verbal in the classroom, with 78% of class time spent talking at

children and engaging in choral recitation, versus 73% for male teachers (not statistically significant). Male teachers spend more time monitoring students as they perform written exercises (22%) for males versus 16% for females ($p<.05$) (Figure 13). Female teachers asked 6.3 close-ended questions over the observation segment (10 minutes in length), versus 5.4 question for male teachers (See Figure 10).

Overall, both female and male teachers exhibited a simple pedagogical routine, relying heavily on lecture and oral recitation. Gender differences do exist but only to a moderate degree. A small number of instructional tools were utilized by most teachers. Very few questions were asked of individual pupils.

In columns 3 and 4 (Table 2) we contrast pedagogical behaviors of African and expatriate teachers. Overall the patterns are quite similar. Pupils in classrooms led by an African teacher were observed to be using fewer instructional tools (Figure 11), 3.2 per observed segment versus 3.9 within classrooms led by an expatriate teacher ($p<.01$). This is mainly due to the fact that exercise books were used twice as often by pupils in the classrooms of expatriate teachers (not shown in Table 2). African teachers were more verbal in the classroom, with 78% of instructional time dedicated to lecturing and choral recitation, versus 67% for expatriate teachers ($p<.001$).

In columns 5 and 6 (Table 2) we focus on pedagogical differences displayed by math teachers. Again, the comparison with social studies teachers is illustrative and not unrepresentative of differences between math and other subject area. Math teachers mobilized pupils to use a greater number of instructional tools: 4.7 different tools in math classes on average versus 2.8 in social studies (for math versus non-math classes, $t=5.6, p<.0001$; see also Figure 11). Pupils are required to write more consistently in math classes ($p<.001$) [See Figure 12]. Students in math classes also must respond to more close-ended questions ($p<.01$) and fewer open-ended questions ($p<.0001$) [See Figures 9 & 10]. Math teachers are less dominant and verbal during the instructional process, lecturing 70% of the time, versus 76% for all other teachers and 88% for social studies teachers (Figure 14). Our multivariate models will show that these curricular effects, especially for math teachers, remain significant after holding constant other factors.

How consistent are teachers' pedagogical practices? In order to assess variability of teacher behavior in terms of their use of instructional tools, we conducted two analyses: First, a consistency analysis was carried out to measure the total variance in specific behaviors over time within individual teachers (across multiple observations over time; Maxwell, Camp, and Arvey 1986). Anderson and Burns (1989), focusing on the consistency of teacher behaviors in the United States and Europe, found that less than half of the total variance was attributable to between teacher differences (reporting the

eta-squared for a oneway ANOVA). In Botswana teacher study, however, the proportion of total variance attributable to between-teachers for our nine (dependent) pedagogical behaviors ranged from .58 to .72 (mean eta-squared = .64). The residual error variance attributable to the two repeated observations is quite modest. Botswana teachers appear to be much more consistent, due largely to the simplicity of their pedagogical routines.

Second, we calculated Spearman rank-order correlations among teachers over multiple observations. Stallings and Freiberg (1991), for instance, found that teacher behaviors in early primary grades (within the U.S.) were quite consistent with rank-order correlations of between .80 and .90. In Botswana, consistency in pedagogical behavior between the first and second observation was lower. Across our nine teacher behaviors, the rank-order correlations ranged between .30 and .50. Again, this is largely an artifact of the simplicity of technology utilized by the majority of teachers in Botswana (hence little variation is present on which correlations are calculated). If we focus on whether a particular instructional tool was utilized at all (not frequency of use, which was usually quite low), then teacher behavior is quite consistent. For example, 65% of all teachers lectured at the class in both observations (i.e., the seven-minute segment during which the teacher's behaviors were recorded). Another 8% lectured in neither the first nor the second observation. Just 27% of all teachers were inconsistent in lecturing during one (seven-minute segment of the) observational period but not the second. Similarly, 26% of all teachers employed a textbook in both observations; 44% used a textbook in neither observation. Just 30% employed a text in one observation but not the other. We did model levels of consistent use of basic instructional tools, the results of which are reported below.

Explaining Variation in Teacher Behavior: Does Gender Make a Difference?

The next step in our analysis was to ask whether differences in teachers' gender, individual backgrounds, training and socialization and/or institutional roles (especially subject-matter specialties) help to explain the modest levels of variation found in pedagogical practices. We are particularly curious as to whether ethnic and gender differences among teachers better explained behavioral variability, relative to curricular roles and socialization shaped by the school institution. Does the simplicity and consistency of pedagogical routines--reinforced by institutional forces-- stamp out individual differences of young teachers?

In Table 3, we regress the number of instructional tools utilized in classroom over the two observation on individual background characteristics, curricular roles, training and tenure (socialization) levels, grade level, and textbook availability per pupil. That is, we are empirically testing whether these antecedent factors help to explain variation in the complexity of teachers' classroom behavior. We also ran these models separately for

male teachers (where proportions of explained variance were generally highest) and for African teachers.

Findings were stronger when actual pupil behavior was being observed (columns 4-6). Ethnic and gender characteristics of teachers were unrelated to pupils behavior. Math and English teachers consistently used more instructional tools with greater frequently. Interestingly, however, the number of textbooks observed per pupil was negatively related to the total number of instructional tools utilized by pupils. Note that these models are remarkably similar, regardless of whether we look at all teachers, males only, or just African teachers.

In Table 4, we focus on two commonly utilized instructional materials: textbooks and pupil exercise books. Pupils utilized textbooks more frequently in English and Setswana classes, and this tendency was observed for Form 2 classes (except among African teachers, column 3). Textbooks also are utilized more frequently in Form 2 classes. Use of exercise books is more frequently observed in math classes, and less frequently observed where textbooks were more widely available. Both female and African math teachers tended to use exercise books less frequently (columns 4-6). This is the first instance where the individual background of teachers is related to actual pedagogical behavior (Figures 25 and 26).

In order to see some interaction gender effect, we imported student gender variable from 1990 data set so that we could build three-way ANOVA models.[3] Figures 17 and 18 tell us that female pupils in non-math classes were more likely to be asked to engage in written exercises. Controlling for teacher gender, female students performed written exercises more frequently than male students. Similar relationship is observed for use of textbooks by students since frequency of use are highly (negatively) related to the written exercises.

Task demands place on students. Our basic model can not explain significant portions of the variance in the frequency with which pupils were observed reading textbooks or other material. However, when looking at the frequency with which pupils must write in class, significant shares of the variance can be explained based on background and contextual factors (Table 5). Individual differences play a slightly larger role in this area of task demands. For African teachers (column 3), female tend to require more frequent written exercises. On the other hand, female math teachers

[3] 1990 data were collected with modified observation instruments. Randomly selected cluster of female and male students were observed to assess whether girls were treated differently by (male and female) teachers.

(GENDER x MATH) demand written tasks less frequently. Math teachers overall organize more written exercises. Textbook availability is negatively related to assignment of written work (an apparent substitution process, whereby teachers who rely on the textbook demand less writing).

Another facet of task demands relates to the frequency and form of questions posed by the teacher. Above we reported the low frequency with which teachers put question to students. Our basic model failed to explain what little variation was observed in the total number of questions teachers posed during this ten-minute segment (See Figures 9 and 10). However, if we separately look at open-ended and close-ended questions among African teachers only, we are able to explain some of the variation in questions asked of pupils by the teacher. Individual background makes little difference. Math teachers, not surprisingly, ask much fewer open-ended, and more close-ended questions, with relationship reaching statistical significance for African teachers (Figures 21 and 22). For African teachers, longer tenure or experience is positively related to posing more complex questions. Still, just 16% of the variance can be explained, in part due to the infrequency with which questions are asked by teachers (results appear in columns 5 and 6 of Table 6). Figure 21 also suggests that the more education African teachers received, the more likely they would ask open-ended questions although the comparison between DIPLOMA+ and DIPLOMA- is not statistically significant.

We also looked at the ratio of the number of teacher questions directed at the entire class (usually requiring choral recitation) divided by the number directed to an individual pupil. The mean value of this ratio equalled 20:1. We cannot explain significant portions of the variance in this ratio. Language teachers (English and Setswana) do tend to direct more questions to an individual pupils, although only the Setswana effect is statistically significant ($p < .05$). Among males, African teachers tend to direct more questions to the entire class (interaction effect;$p < .05$).

Use of instructional time. Teachers spend the bulk of time standing before the class, lecturing at largely passive pupils, at times demanding choral recitation as detailed above. We attempted to model what variation is observed around this typical pedagogical script. Overall, Figure 13 shows that female teachers spend more time engaging students to interactive mode while male teachers spend more time monitoring students in their own activities. The subject matter effect is clearly presented in Figure 14 that math teachers spend almost 3 times more time than teachers of social studies in supervising students. However, proportions of variance explained are not impressive. Yet certain relationships are important. Main effects show that both female and African teachers tend to be more verbal with pupils in the classroom, with 78% (for both female and African teachers) of class time spent talking at children or engaging in choral recitation, versus 73% for male teachers and 67% for expatriates (Tables 2 and 6). Teachers with

higher levels of training tend to spend more time lecturing in classrooms. Among African teachers, those with longer tenure spend less time lecturing at pupils. Figure 15 suggests that teachers who teach technology and math spend much more time on monitoring students, therefore less time on engaging students in activities than teachers of other subjects. When we relate African teachers educational background to time they spend on classroom activities, we see a moderate trend indicating that the more education teacher gets the more likely (s)he spends time engaging in pupils' activities (Figure 16).

Conclusions:

As we have found that gender differences do exist to a moderate degree in Botswana teachers in terms of their social status, school treatment, teaching behaviors, and instructional tools used, educational decision makers may now ponder: are these differences related to the result of a sudden dropout of female students at junior secondary level and quick fall of female students' exam scores? It would be too early to make a conclusion at this point. We should note that no "good" or "bad" behaviors are categorically indicated in this report. However, certain findings from policy oriented variables may suggest to us that female teachers should be treated more equally at school level: Compared to male teachers, female teachers are less likely to be provided with a house by school; female teachers in general are more likely to teach more than one subjects; school headmasters less likely pay a visit to female teacher's class. In terms of gender differences in teaching behaviors, a legitimate assumption that the gender differences we have identified may predict to a certain degree the students' achievement level will get tested in a foreseeable future.

Overall, both male and female teachers in Botswana follow certain ritual routines in their classroom behaviors. The time they spend on teaching or inducing learning is generally routinized; frequencies of different instructional tools are usually patterned; questions directed to students are limited and predictable; Students behaviors (even though they are not the focus of our study) are often influenced by the teachers behaviors, so they are pretty much simple and in patterns (pupil reading and writing in classrooms). These simple and ritualized behaviors are moderately related to gender, background educational training, subjects they teach (yet math subject stands out), teaching experience and family social economic status. The multivariant factors in our models provide us with moderate power to explain variation of Botswana teachers' behaviors, but there still is a larger percentage of variance remain unexplained by some other unknown factors. Educational policy makers may like to reform teachers behaviors so that they can do a "better job" in students learning by reinforcing bureaucratic control and professional commitment, but the ritualistic quality of teachers' performance in Botswana classrooms may well become a wall of preventing desired change from taking

place. Local community pressure and school "treatment" may be stronger factors influencing the teachers' classroom behaviors for the more direct contact and more beneficiary relationship. Institutional policy may be difficult to penetrate the "territory" of teachers--classroom. We find that policy variables such as educational training, curriculum strategy, instructional tools, and gender makes limited difference in terms of teaching behaviors and teachers performance in classrooms. Whether this could be true to the relationship to students achievement remains to be analyzed.

Table list

1. Mean characteristics of teachers and their classrooms by teachers' gender, ethnicity, and subject specialty.
2. Selected mean teaching behaviors (dependent variables) by teacher gender, ethnic background, and subject specialty.
3. Teacher characteristics related to the complexity/number of instructional tools used (unstandardized betas and t-statistics reported).
4. Teacher characteristics related to textbook and exercise book use (unstandardized betas and t-statistics reported).
5. Teacher characteristics related to frequency of written exercises (unstandardized betas and t-statistics reported).
6. Teacher characteristics related to classroom time-use and teacher questioning (unstandardized betas and t-statistics reported)+.

Figure List

Appendix I

Classroom Observation Instrument

Appendix II

Data-base Development and Data-analysis Steps

Table 1

MEAN CHARACTERISTICS OF TEACHERS AND THEIR CLASSROOMS
BY TEACHERS' GENDER, ETHNICITY, AND SUBJECT SPECIALTY

	Females n=113	Males n=170	Africans n=216	Expatriates n=75	Mathematics n=54	Social Studies n=43
TEACHER BACKGROUND						
Childhood house had thatched-roof (% answering, yes)	55%	64%	79%	10%	65%	77%
Childhood house had electricity	46%	36%	17%	94%	32%	19%
Father's years of schooling	10.8 (4.1)	10.0 (4.5)	9.4 (4.7)	12.4 (2.2)	9.5 (4.7)	10.5 (4.7)
Total teaching experience (years)	3.9 (4.3)	4.6 (4.9)	3.8 (4.2)	5.8 (5.5)	4.6 (5.2)	4.4 (5.2)
Tenure at this school (years)	2.3 (2.6)	2.1 (1.5)	2.1 (1.4)	2.4 (3.1)	2.4 (1.9)	2.6 (1.6)
Annual salary (US$)	4920 (1632)	5160 (1662)	5010 (1438)	5247 (2152)	5460 (1328)	5042 (1552)
TEACHER TRAINING AND CURRICULAR ROLE						
Percentage of teachers with more than 2-year diploma	28%	31%	11%	81%	21%	17%
Percentage of teachers teaching:						
English	28%	23%	24%	60%	--	--
Setswana	23%	9%	20%	0%	--	--
Mathematics	16%	20%	20%	13%	--	--
Social studies	12%	16%	18%	7%	--	--
Other subjects	21%	29%	18%	20%	--	--
	(100%)	(100%)	(100%)	(100%)		
CLASSROOM CHARACTERISTICS						
Number of textbooks counted per pupil	.76	.77	.79	.71	.85	.77

Note: Total number of teachers (n) equals 244 for which complete data are available.

Table 2

SELECTED MEAN TEACHING BEHAVIORS (dependent variables)
BY TEACHER GENDER, ETHNIC BACKGROUND, AND SUBJECT SPECIALTY

	Females n=113	Males n=170	Africans n=216	Expatriates n=75	Mathematics n=54	Social Studies n=43
TECHNICAL COMPLEXITY/INSTRUCTIONAL TOOLS						
No. of teaching materials used by pupils (per observation)	3.1 (1.9)	3.6 (2.0)	3.2 (1.9)	3.9 (2.0)	4.7 (2.0)	2.8 (1.8)
No. of instances pupils reading	0.4 (0.4)	0.4 (0.5)	0.4 (0.4)	0.5 (0.5)	0.4 (0.4)	0.4 (0.4)
No. of instances pupils writing	0.6 (0.6)	0.7 (0.6)	0.6 (0.6)	0.7 (0.6)	1.3 (0.7)	0.6 (0.4)
TEACHER'S QUESTIONING BEHAVIOR						
No. of close-ended questions asked by teacher (per obs.)	6.3 (5.4)	5.4 (4.8)	5.7 (5.1)	6.0 (4.9)	7.4 (5.8)	4.8 (4.0)
No. of open-ended questions asked by teacher	2.2 (2.2)	2.3 (3.0)	2.3 (2.7)	2.2 (2.8)	0.7 (1.2)	3.8 (3.2)
TEACHER'S TIME USE						
% Time spent talking at class and in choral recitation	78% (20)	73% (22)	78% (20)	67% (22)	70% (20)	88% (12)
% Time spent monitoring pupils doing written exercises/seatwork	16% (20)	22% (21)	18% (20)	26% (21)	26% (20)	9% (11)
% Time spent on administrative tasks and organizing lessons	6% (7)	6% (5)	5% (4)	8% (9)	5% (4)	4% (3)

Table 3

TEACHER CHARACTERISTICS RELATED TO THE COMPLEXITY/NUMBER OF INSTRUCTIONAL TOOLS USED
(unstandardized betas and t-statistics reported)

[Y1A/Y1B]	OBSERVING THE TEACHER			OBSERVING PUPILS		
	All	Male	African	All	Male	African
TEACHER SELECTION POLICY AND DEMOGRAPHICS						
Teacher gender (female=2)	1.95 (1.07)	--	0.11 (0.08)	0.22 (0.19)	--	0.50 (0.60)
African teachers (african=2)	1.38 (0.77)	1.12 (0.65)	--	-0.15 (-0.13)	-0.07 (-0.06)	--
Gender x African	-0.83 (-0.99)	--	--	0.18 (0.15)	--	--
Gender x math	-0.76 (-0.89)	--	-0.59 (-0.58)	-0.72 (-1.21)	--	-0.82 (-1.27)
African x math	-1.23 (-1.10)	-1.64 (-1.17)	--	-0.64 (-0.92)	-0.58 (-0.65)	--
TEACHER ROLES AND SOCIALIZATION						
Math class	4.96 (2.08)*	5.07 (1.98)*	2.22 (1.47)	4.31 (2.85)**	3.48 (2.15)*	3.29 (3.40)***
English class	0.40 (0.87)	0.23 (0.39)	0.15 (0.28)	1.25 (4.28)***	1.17 (3.16)**	1.31 (3.84)***
Setswana class	-0.59 (-1.05)	-0.23 (-0.28)	-0.66 (-1.17)	0.20 (0.57)	0.30 (0.58)	0.27 (0.75)
Training level (diploma+ = 2)	-0.78 (-1.25)	0.14 (0.17)	-0.73 (-1.21)	-0.06 (-0.15)	0.72 (1.33)	-0.04 (-0.10)
Tenure (sqroot)	0.47 (1.43)	0.47 (1.05)	0.36 (0.90)	0.28 (1.33)	0.15 (0.53)	0.17 (0.66)
Grade level (1 or 2)	-0.11 (-0.32)	-0.24 (-0.50)	0.02 (0.05)	0.44 (1.88)	0.39 (1.29)	0.35 (1.32)
TEXTBOOK AVAILABILITY (books per pupil)	-0.49 (-0.67)	-1.15 (-1.19)	-1.16 (-1.42)	-1.34 (-2.85)**	-1.25 (-2.04)*	-1.98 (-3.75)***
FULL EQUATION						
Intercept	1.60	1.33	5.09	2.05	-3.07	-1.88
F-value	2.92***	2.01*	2.10*	6.67***	5.58***	6.55***
DF	12,231	9,137	9,171	12,231	9,136	9,170
Adj. r-square	.09	.06	.05	.22	.22	.22

* p<.05 ** p<.01 *** p<.001

Table 4

TEACHER CHARACTERISTICS RELATED TO TEXTBOOK AND EXERCISE BOOK USE
(unstandardized betas and t-statistics reported)

[YPTEXTBK/YPEXBOOK]	TEXTBOOK UTILIZATION			EXERCISE BOOK UTILIZATION		
	All	Male	African	All	Male	African
TEACHER SELECTION POLICY AND DEMOGRAPHICS						
Teacher gender (female=2)	0.01 (0.02)	--	-0.16 (-0.28)	1.49 (1.88)	--	1.20 (2.12)*
African teachers (african=2)	-0.52 (-0.70)	-0.09 (-0.13)	--	1.43 (1.91)	0.90 (1.22)	--
Gender x African	0.01 (0.04)	--	--	-0.25 (-0.71)	--	--
Gender x math	-0.01 (-0.01)	--	0.17 (0.38)	-1.06 (-2.64)**	--	-1.25 (-2.81)**
African x math	0.12 (0.27)	-0.27 (-0.49)	--	-1.12 (-2.39)*	-0.82 (-1.37)	--
TEACHER ROLES AND SOCIALIZATION						
Math class	0.86 (0.85)	1.62 (1.57)	0.84 (1.25)	4.76 (4.64)***	3.17 (2.89)**	2.83 (4.30)***
English class	1.81 (9.25)***	1.83 (7.74)***	1.58 (6.56)***	0.02 (-0.13)	-0.08 (-0.34)	0.08 (0.35)
Setswana class	0.89 (3.68)***	1.22 (3.67)***	0.83 (3.28)**	-0.11 (-0.47)	-0.13 (-0.39)	-0.07 (-0.30)
Training level (diploma+ = 2)	-0.32 (-1.21)	-0.30 (-0.89)	-0.27 (-0.98)	-0.11 (-0.42)	0.31 (0.85)	-0.13 (-0.49)
Tenure (sqroot)	0.07 (0.55)	0.02 (0.15)	0.14 (0.81)	0.17 (1.25)	0.21 (1.11)	0.19 (1.07)
Grade level (1 or 2)	0.44 (2.82)**	0.53 (2.75)**	0.27 (1.48)	0.05 (0.37)	-0.07 (-0.37)	0.08 (0.48)
TEXTBOOK AVAILABILITY (books per pupil)	0.02 (0.07)	0.12 (0.24)	-0.41 (-1.10)	-0.89 (-2.81)**	-1.01 (-2.43)*	-1.12 (-3.13)**
FULL EQUATION						
Intercept	-3.54	-4.80	-3.15	-3.66	-1.89	-1.26
F-value	8.72***	6.98***	5.67***	5.83***	5.86***	4.97***
DF	12,231	9,137	9,170	12,231	9,136	9,170
Adj. r-square	.28	.27	.19	.19	.23	.16

* p<.05 ** p<.01 *** p<.001

Table 5

TEACHER CHARACTERISTICS RELATED TO FREQUENCY OF WRITTEN EXERCISES
(unstandardized betas and t-statistics reported)

[Y2B_WRIT]	FREQUENCY OF WRITTEN EXERCISES		
	All	Male	African
TEACHER SELECTION POLICY AND DEMOGRAPHICS			
Teacher gender (female=2)	1.07 (1.50)	--	1.57 (3.04)**
African teachers (african=2)	0.10 (0.15)	-0.45 (-0.75)	--
Gender x African	0.05 (0.17)	--	--
Gender x math	-1.15 (-3.18)**	--	-1.48 (-3.64)***
African x math	-0.40 (-0.94)	0.20 (0.41)	--
TEACHER ROLES AND SOCIALIZATION			
Math class	3.96 (4.29)***	1.79 (2.01)*	3.67 (6.08)***
English class	0.15 (0.89)	0.12 (0.59)	0.30 (1.41)
Setswana class	0.01 (0.04)	0.05 (0.18)	0.05 (0.23)
Training level (diploma+ = 2)	0.05 (0.21)	0.47 (1.57)	0.02 (0.08)
Tenure (sqroot)	0.09 (0.76)	0.18 (1.19)	0.05 (0.32)
Grade level (1 or 2)	0.08 (0.60)	-0.20 (-1.25)	0.20 (1.22)
TEXTBOOK AVAILABILITY (books per pupil)	-0.80 (-2.81)**	-1.00 (-2.98)**	-0.95 (-2.90)**
FULL EQUATION			
Intercept	-2.58	-0.19	-3.40
F-value	8.58***	12.07***	8.97***
DF	12,231	9,136	9,170
Adj. r-square	.27	.41	.29

* p<.05 ** p<.01 *** p<.001

Table 6

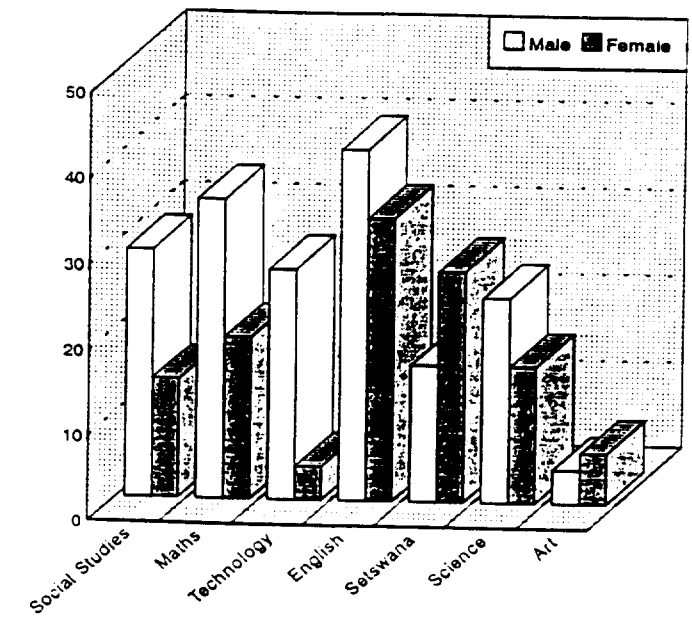
TEACHER CHARACTERISTICS RELATED TO CLASSROOM TIME-USE AND TEACHER QUESTIONING
(unstandardized betas and t-statistics reported)+

[SQ_YT1,2,3]	% TEACHER TALK AND RECITATION		% MONITORING PUPIL EXERCISES		FREQUENCY OF OPEN-ENDED QUESTIONING	
	All	African	All	African	All	African
	1	2	3	4	5	6
TEACHER SELECTION POLICY AND DEMOGRAPHICS						
Teacher gender (female=2)	-2.48 (-2.18)*	0.28 (0.33)	-3.75 (-2.24)*	-0.05 (-0.04)	0.14 (0.23)	-0.12 (-0.29)
African teachers (african=2)	-2.37 (-2.15)*	--	-2.26 (-1.39)	--	0.17 (0.30)	--
Gender x African	1.33 (2.54)*	--	1.71 (2.23)*	--	-0.21 (-0.79)	--
Gender x math	-0.21 (-0.12)	-0.21 (-0.31)	0.21 (-0.25)	-0.01 (-0.01)	0.21 (0.70)	0.08 (0.24)
African x math	-0.12 (-0.18)	--	-0.73 (-0.73)	--	0.03 (0.09)	--
TEACHER ROLES AND SOCIALIZATION						
Math class	1.23 (0.86)	1.13 (1.12)	2.33 (1.09)	1.26 (0.85)	-1.18 (-1.53)	-0.97 (-1.97)*
English class	-0.13 (-0.46)	-0.10 (-0.28)	-0.28 (-0.65)	-0.29 (-0.52)	-0.01 (-0.02)	-0.04 (-0.24)
Setswana class	-0.35 (-1.03)	-0.32 (-0.90)	-1.03 (-1.99)*	-0.97 (-1.77)	0.32 (1.77)	0.28 (1.56)
Training level (diploma+ = 2)	0.77 (2.05)*	0.78 (2.02)*	1.47 (2.42)*	1.43 (2.28)*	-0.21 (-1.03)	-0.22 (-1.11)
Tenure (sqroot)	-0.07 (-0.37)	-0.53 (-2.03)*	-0.19 (-0.66)	-0.80 (-2.01)*	0.11 (1.05)	0.36 (2.76)**
Grade level (1 or 2)	0.46 (2.01)*	0.57 (2.09)*	0.49 (1.45)	0.68 (1.67)	0.03 (0.31)	0.01 (0.01)
TEXTBOOK AVAILABILITY (books per pupil)	-0.88 (-1.94)	-0.86 (-1.61)	-1.52 (-2.24)*	-1.86 (-2.28)*	0.21 (0.90)	0.23 (0.88)
FULL EQUATION						
Intercept	7.03	2.20	5.33	0.74	1.78	1.82
F-value	3.74***	2.66**	4.31***	3.54***	3.55***	4.70***
DF	12,212	9,157	12,202	9,146	12,232	9,171
Adj. r-square	.13	.08	.16	.13	.11	.16

+ All three dependent variables have been transformed into the square roots of raw values to remedy skewness in the original distribution.

Figure 1

Teacher Gender and Teaching Subjects



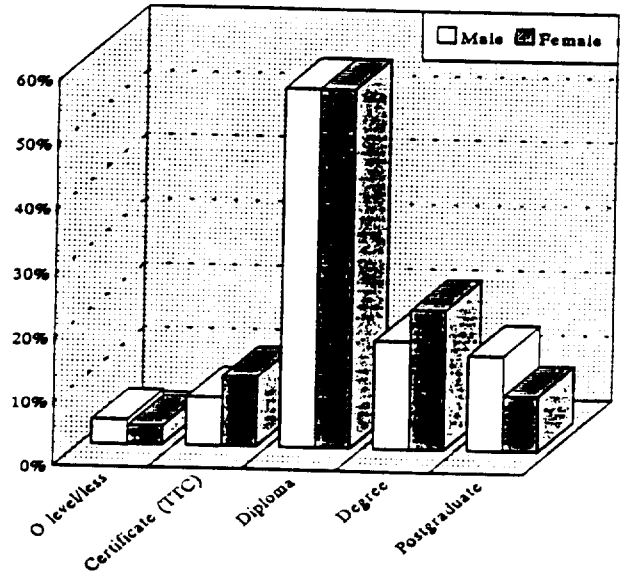
Male	29	35	27	41	16	24	4
Female	14	19	4	33	27	16	6

Female teachers are disproportionately allocated to Setswana and Art classes while male teachers are more likely teaching in Social Studies, Maths, Technology, English and Science.

All teachers/BTCA Study '89

Figure 2

Teacher Gender and Teacher Education



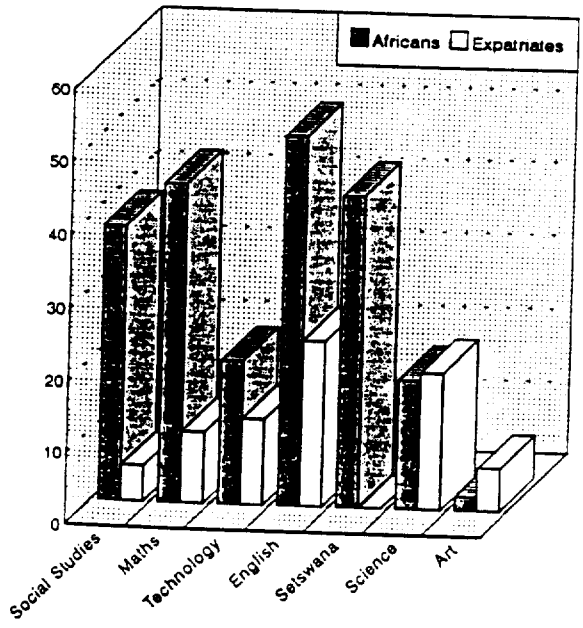
Male	3.9%	7.7%	56%	17%	15%
Female	3%	11%	56%	22%	8.8%

We find no significant difference in educational backgrounds of male and female teachers in Botswana secondary schools.

All teachers/BTCA Study '89

Figure 3

Teacher Nationality and Teaching Subjects



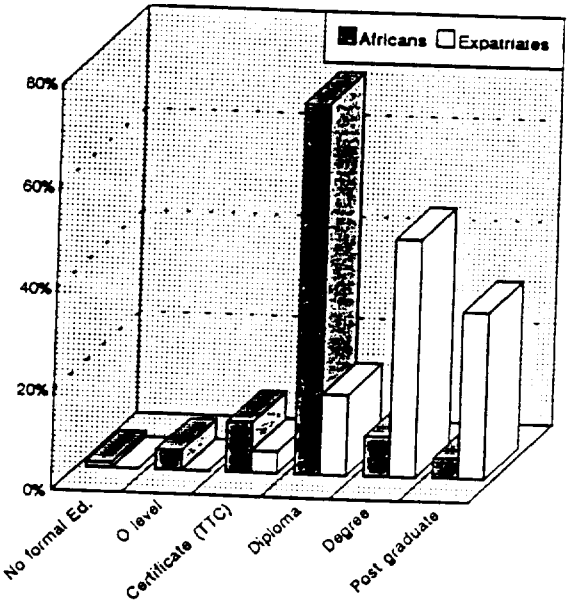
Africans	38	44	20	51	43	18	2
Expatriates	5	10	12	23	0	19	6

African teachers are more concentrated in Setswana, Maths, and Social Studies while expatriates teach in science and English (1/2 of all expatriates)

All teachers/BTCA Study '89

Figure 4

Teacher Nationality and Teacher Education



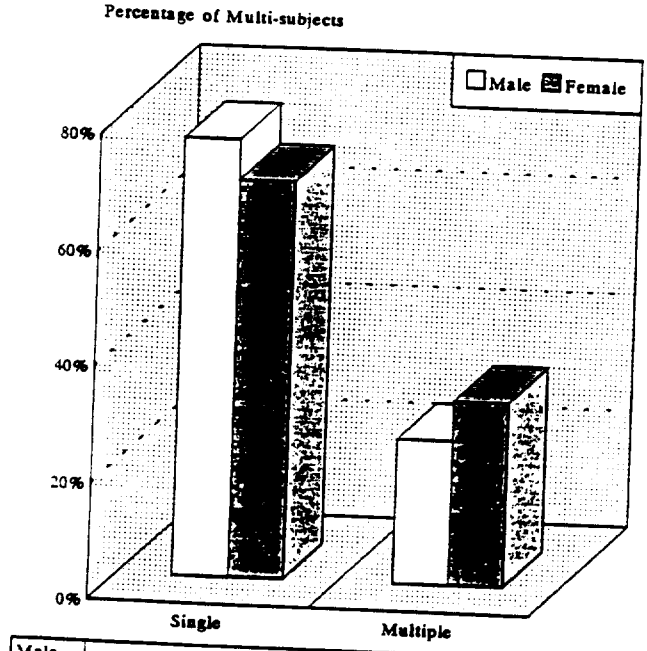
Africans	1.1%	4%	10%	73%	8%	4%
Expatriates	0%	0%	4.3%	16%	47%	33%

There is a significant difference in educational training background between Africans and Expatriates.

All teachers/BTCA Study '89

Figure 5

Teacher Gender and Multi-Subjects



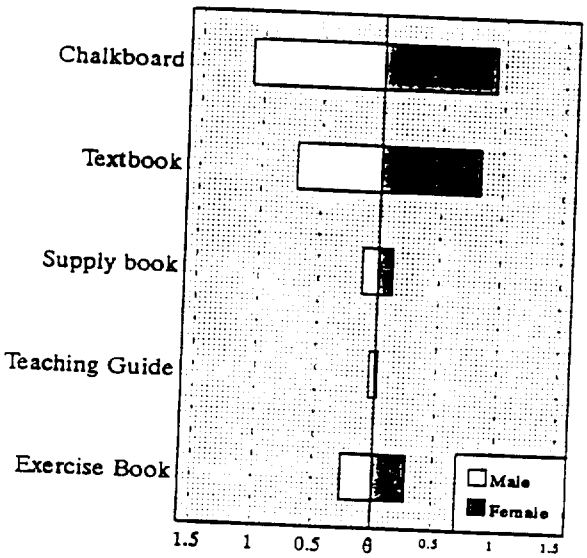
Male	75.3%	24.7%
Female	68.4%	31.6%

All teachers/BTCA Study '89

There are proportionally more female teachers who teach more than two subjects than male teachers

Figure 6

Comparison of Teaching Materials Being Used in Classroom
Between Male and Female Botswana Teachers



Freq. of materials used per 100 classroom obser

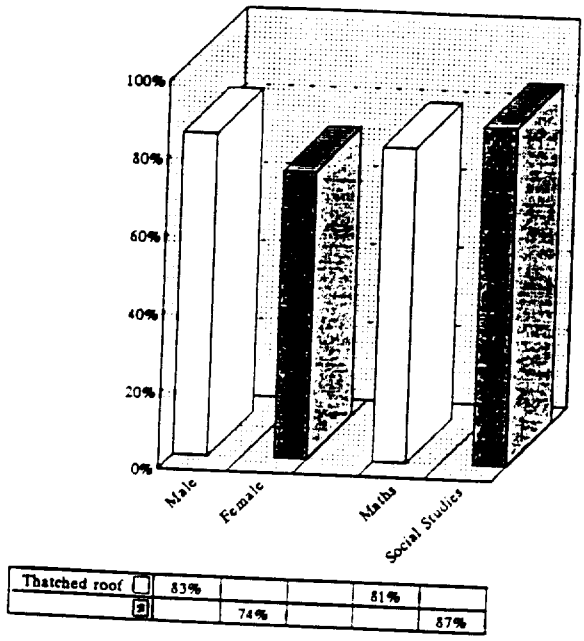
Male	1.09	0.7	0.13	0.05	0.26
Female	0.93	0.82	0.12	0.02	0.27

All teachers/BTCA Study '89

During the first 14 minutes of class observation, use of teaching materials are catergorially observed together with teacher behavior. Units of measurement here represent frequency of instructuional materials used per 100 classroom observations.

Figure 7

Childhood House with Thatched Roof
by Gender, Ethnic, and Subjects

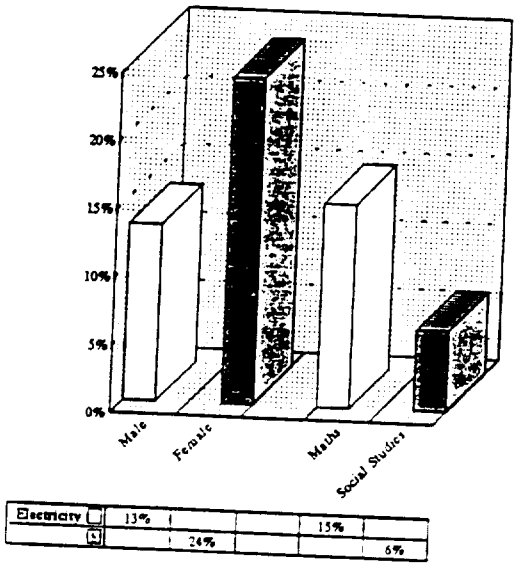


Female teachers are slightly better off than male teachers. And Maths teachers on average are from better family background.

Batswana & African Expatriate Teachers/BTCA Study '89

Figure 8

Childhood House with Electricity
by Gender, Ethnic, and Subjects



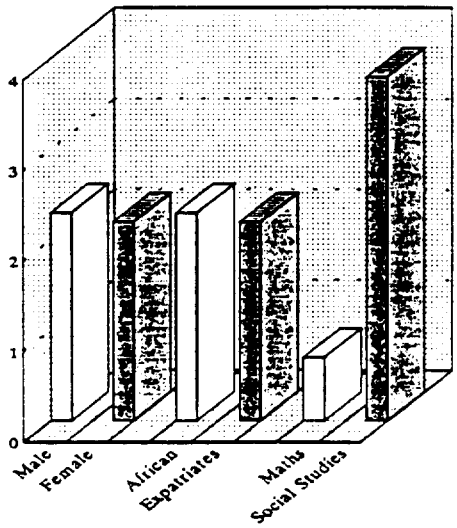
Electricity measure is highly related to "Thatched roof". Both gender and subject differences are confirmed in this chart.

Batswana & African Expatriate Teachers/BTCA Study '89

figure 9

No. of open-ended Questions
by Gender, Ethnic Background, and Subject Specialty

A significant difference is observed between maths teachers and teachers who teach social studies in asking open-ended questions..



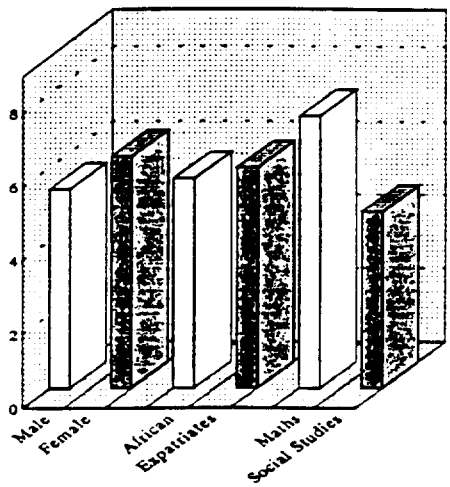
Open-ended questions		2.3			2.3			0.7	
			2.2			2.2			3.8

All teachers/BTCA Study '89

figure 10

No. of Close-ended Questions
by Gender, Ethnic Background, and Subject Specialty

In addition to difference between teachers of maths and social studies, female teachers on average ask more close-ended questions than their male counterparts.



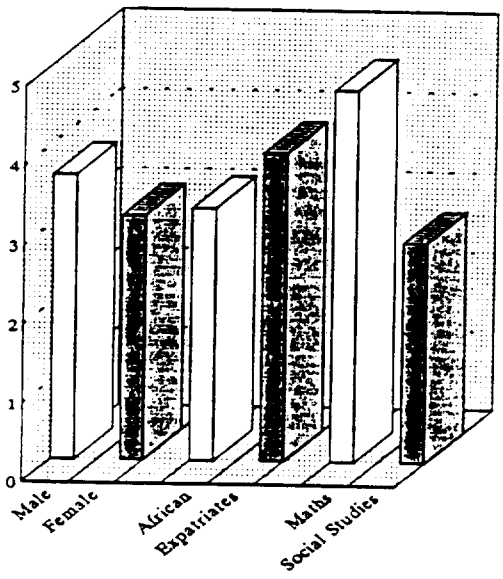
Close-ended questions		5.4			5.7			7.4	
			6.3			6			4.8

All teachers/BTCA Study '89

figure 11

Mean Teaching Materials Used in Classroom
by Teacher Gender, Ethnic Background, and Subject Specialty

Students in Maths class use about 85% more instructional materials than those in class of Social Studies.



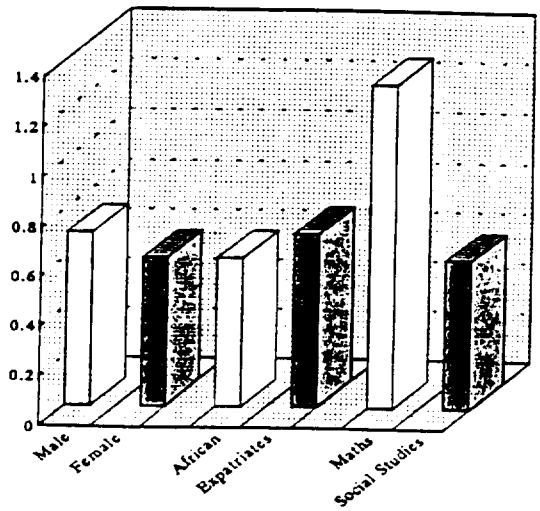
	Male	Female	African	Expatriates	Maths	Social Studies
Teaching materials	3.6		3.2		4.7	
		3.1		3.9		2.8

All teachers/BTCA Study '89

figure 12

Mean No. of Instances Pupils Writing
by Gender, Ethnic Background, and Subject Specialty

Students in Maths class undertake writing exercise twice as much as those in Social Studies class.

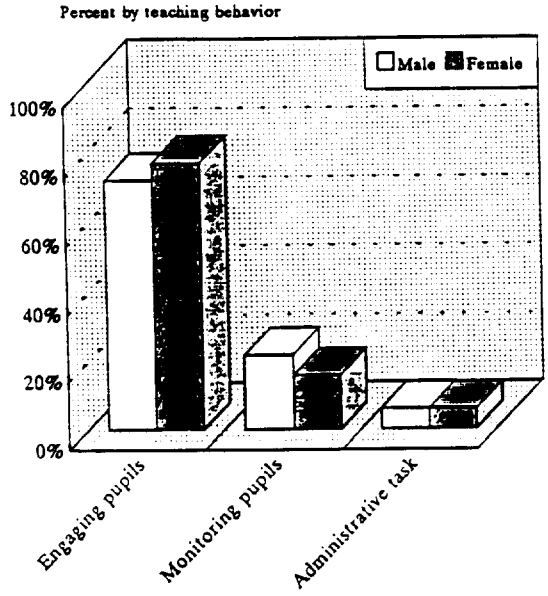


	Male	Female	African	Expatriates	Maths	Social Studies
Pupil writing	0.7		0.6		1.3	
		0.6		0.7		0.6

All teachers/BTCA Study '89

figure 13

Teacher's Time Use



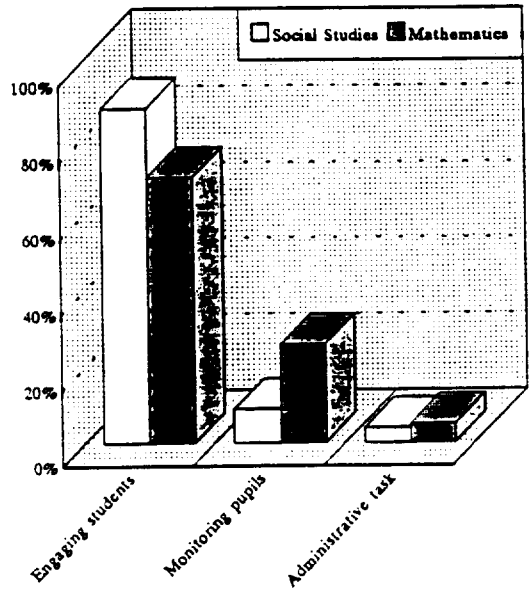
Male	73%	22%	6%
Female	78%	16%	6%

All teachers/BTCA Study '89

Two dimensions: 1) informs how batswana teachers demonstrate "trend" of time use distribution in class; 2) shows small difference between male and female teachers in time use.

figure 14

Teacher's Time Use



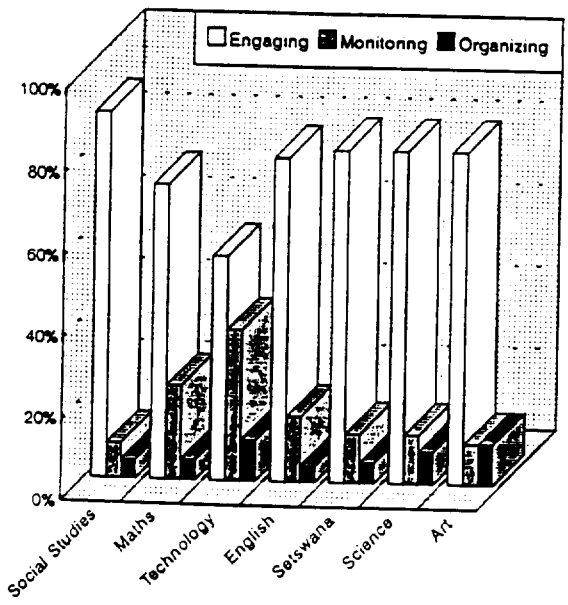
Social Studies	38%	9%	4%
Mathematics	70%	26%	5%

All teachers/BTCA Study '89

This chart descriptively indicates that batswana teachers of maths spend much more time on monitoring students than teachers of social studies.

Figure 15

Time Use by Subjects Being Taught



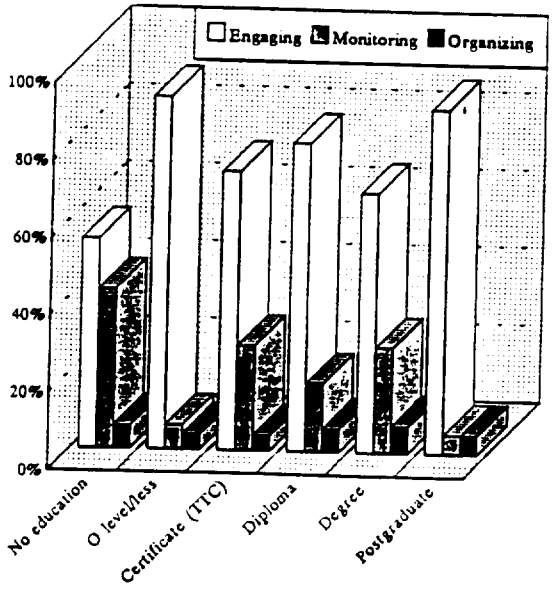
Engaging	89%	72%	55%	79%	81%	81%	81%
Monitonng	8.6%	23%	37%	16%	12%	12%	10%
Organizing	4.6%	4.9%	10%	4%	5%	8%	10%

It is suggested that teachers of technology and maths spend more time on monitoring students (or less time on engaging students) than teachers of other subjects.

Batswana & African Expatriate Teachers/BTCA 89'

Figure 16

Time Use by Educational Background



Engaging	54%	91%	72%	79.6%	67%	89%
Monitoring	41%	6.3%	27.1%	17.6%	27.2%	5%
Organizing	6%	4%	4%	6%	7%	5%

The "trend" looks like the more education you get the more likely you spend time interacting with students although it is not statistically significant..

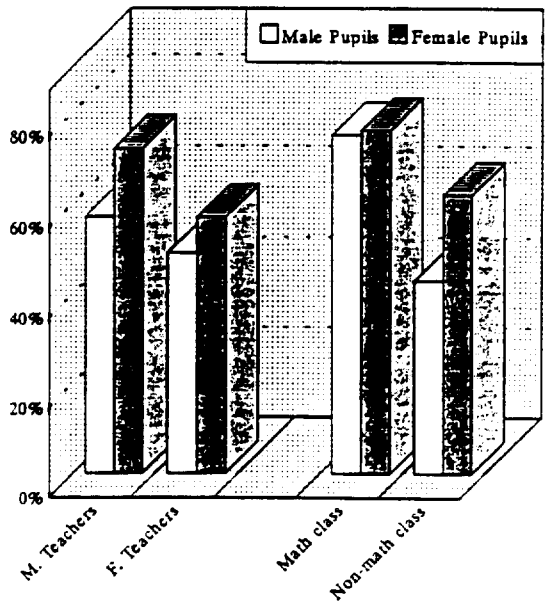
Batswana & African Expatriate Teachers/BTCA Study '89

Figure 17

Pupils Show Written Exercises

Percentage of Written Exercises/Per Observation Period

Female pupils in non-math classes were more likely to be asked to show written exercises. Controlling for teacher gender, female students show written exercises more than their male counterparts.



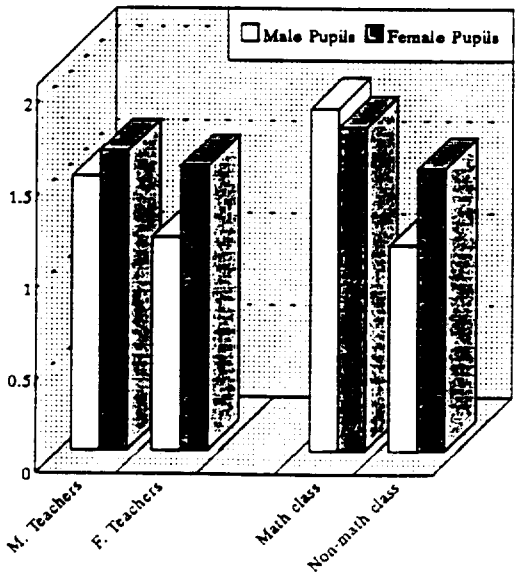
Male Pupils	57%	49%		75%	43%
Female Pupils	72%	57%		76%	62%

All teachers/BTCA Study '90

Figure 18

Pupil Textbooks Used in Classroom

Counts of Textbooks Used/Per Observation Period



It is not surprising to see that this chart has similar relationship as the one above. Textbooks used are highly correlated with Written Exercises.

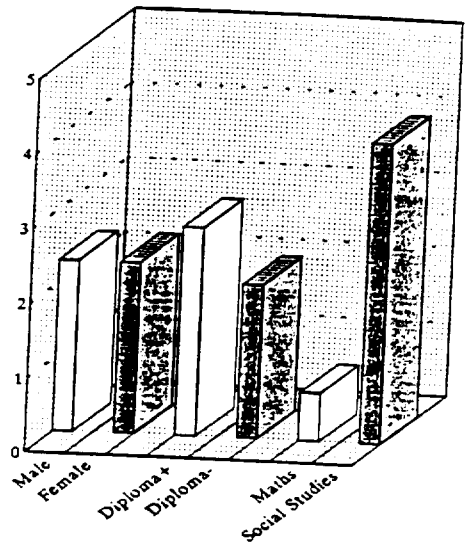
Male Pupils	1.49	1.16		1.86	1.12
Female Pupils	1.63	1.55		1.76	1.54

All teachers/BTCA Study '90

figure 21

Open-ended Questions Directed to Students
by Gender, Diploma and Subject Specialty

For African teachers, a significant difference in asking open-ended questions is demonstrated between maths teachers and teachers of social studies.



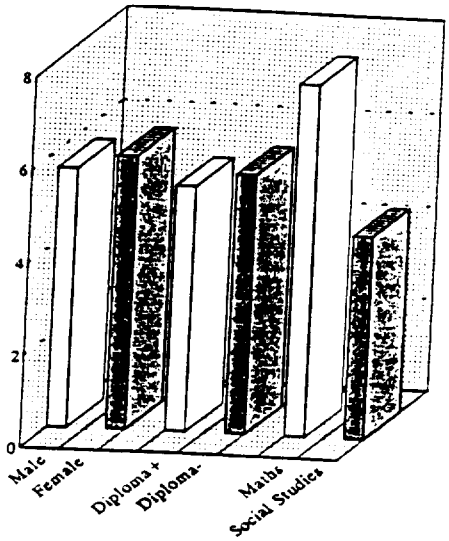
Open-ended questions	2.3		2.8		0.66	
		2.3		2.07		4.03

Batswana & African Expatriates/BTCA Study '89

figure 22

Close-ended Questions Directed to Students
by Gender, Diploma and Subject Specialty

Batswana teachers in social studies ask less close-ended questions than maths teachers.



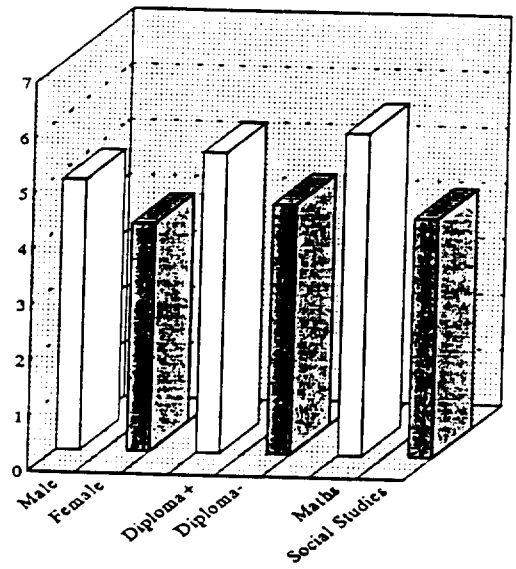
Close-ended questions	5.6		5.3		7.6	
		5.9		5.6		4.4

Batswana & African Expatriates/BTCA Study '89

figure 23

Teaching Materials Used in Classroom
by Teacher Gender, Diploma and Subject Specialty

Differences in these three comparisons are moderate.



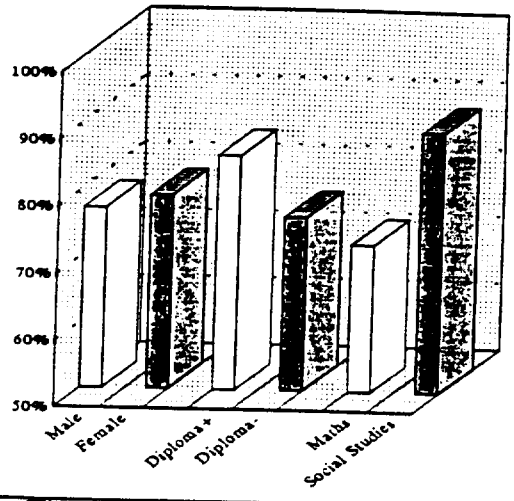
Teaching materials	4.86			5.4			5.8	
		4.1			4.5			4.3

Batswana & African Expatriate Teachers/BTCA Study '89

figure 24

Time Spent on Engaging Students
by Teacher Gender, Diploma and Subject Specialty

Whether teachers have degrees above diploma and below diploma makes Difference in spending time engaing students in classroom activities.

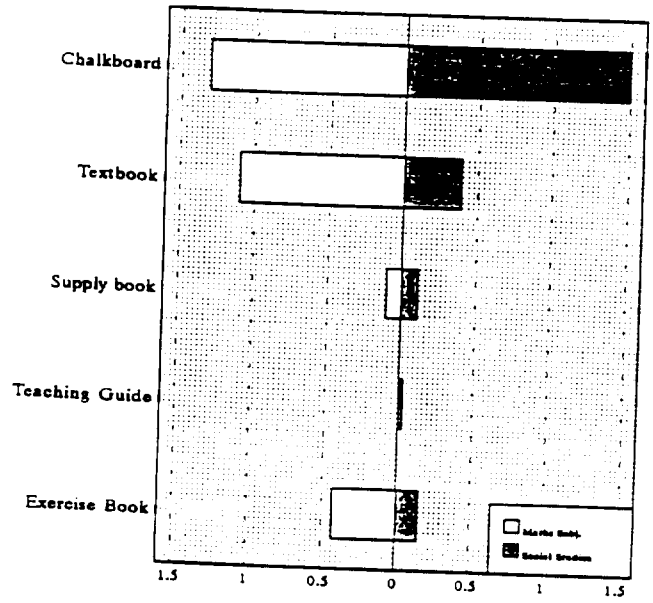


Time spent on	77%			85%			72%	
engaging students		79%			76%			89%

Batswana & African Expatriates/BTCA Study '89

Figure 25

Teaching Tools Used in Classroom
Maths Subject vs Social Studies



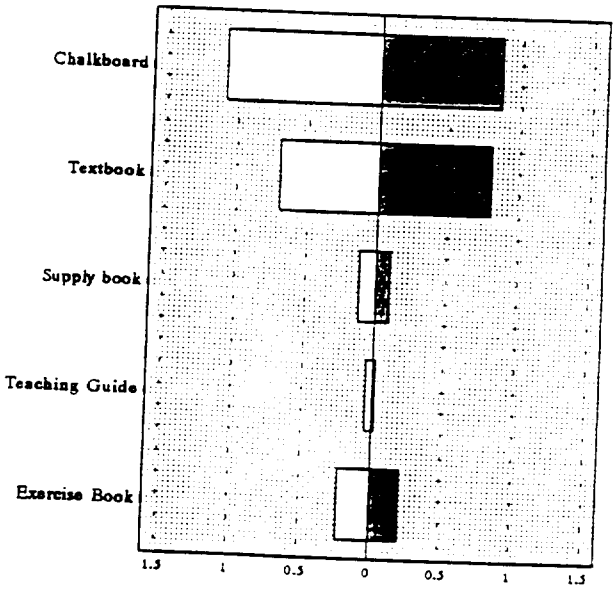
Maths Subj.	1.31	1.1	0.1	0	0.43
Social Studies	1.5	0.39	0.11	0.03	0.15

The fequency of two instructional tools (textbook and exercise book) were used significantly different by teachers of maths and social studies.

Batswana & African Expatriate Teachers/BTCA Study '89

Figure 26

Teaching Tools Used in Classroom
Between African Male and Female Teachers



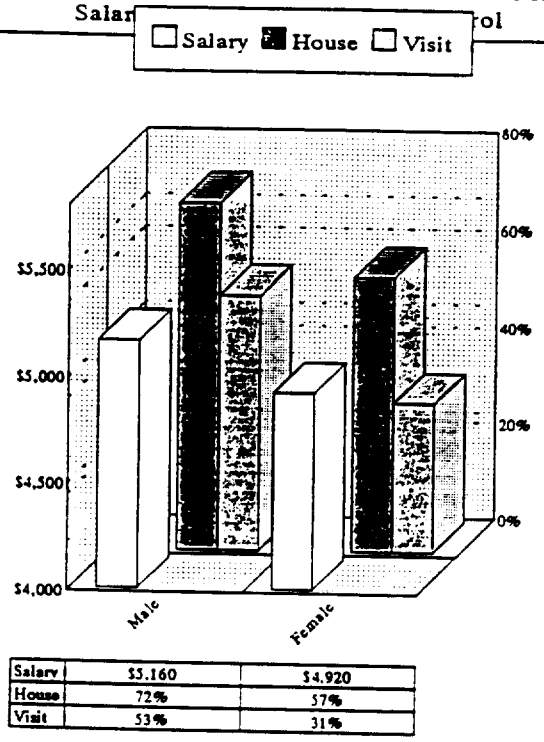
Male	1.09	0.7	0.12	0.05	0.23
Female	0.86	0.8	0.1	0.02	0.21

It appears that female African teachers used less chalkboard, but more textbooks than their male counterparts.

Batswana & African Expatriate Teachers/BTCA Study '89

figure 27

Gender Difference in School "Treatment"



Salary	$5,160	$4,920
House	72%	57%
Visit	53%	31%

Overall, male teachers are given more "attention" to in all 44 schools. 72% of male teachers versus 57% of females were provided houses by schools; 53% of male teachers versus 31% of female teachers were visited by headmasters.

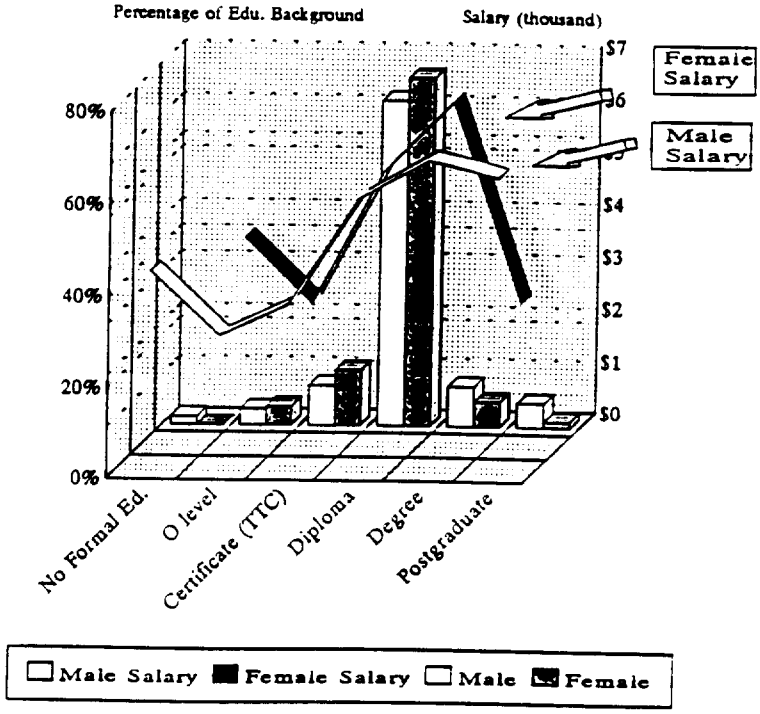
All teachers/BTCA Study '89

figure 28

Teacher Gender and Teacher Education
Salary Level by Teacher Gender

For African teachers only, female teachers make more money than male teachers when they have diploma or degree.

Note: Average national income level is $3,990 (World Bank Report 1991)



Batswana & African Expatriate Teachers/BTCA Study '89

Botswana Classroom Observations

Teacher code number: ___ ___ ___

School code number: ___ ___ ___

Research assistant's code number: ___ ___

Teacher's name: _____

Nationality of teacher: Botswana ___ Other _____

Sex of teacher: Male ___ Female ___

Observation number: _____

If reliability check, your partner's code number: ___ ___

Segment 1 – CLASSROOM MATERIAL AND INPUTS (10 minutes)

	1. Scheduled period start time: ✓ difference	:
	2. Actual start time: ✓	:
	3. Class level:	Form I ___ Form II ___
	4. Subject being taught:	
25-26	5. Number of pupils in the classroom:	
27-28	6. Number of pupils sharing a desk:	
29	7. Number of pupils sitting alone at a desk:	
30	8. Number of pupils sitting on the floor or with no desk:	
31-32	9. Are pupils sitting in conventional rows, one behind the other?	No ___ Yes ___
	10. Does the teacher have a desk or table on which to work?	No ___ Yes ___
	11. How many other tables are in the classroom, excluding the teacher and pupil desks?	
	12. If you can see any of the following items, check the appropriate space.	
33	a Pupil or teacher produced posters or materials on the wall	No ___ Yes ___
34	b Commercially produced posters or materials on the wall	No ___ Yes ___
35	c Chalkboard on a wall	No ___ Yes ___
36	d. Chalk visible	No ___ Yes ___
37	e Textbooks on shelves	No ___ Yes ___
38	f Other books or reading material on shelves	No ___ Yes ___
39	g Maps or globes visible in classroom	No ___ Yes ___
	13. During this first 10-minute segment have pupils used:	
40	a textbooks	No ___ Yes ___
41	b exercise books	No ___ Yes ___
42	c other materials?	No ___ Yes ___
43	14. Were textbooks passed-out to pupils?	No ___ Yes ___
44-45	15. How many pupils have at least one visible textbook (not passed-out?)	
46-47	16. How many pupils have at least one exercise book or paper on which to write?	
48-49	17. How many pupils have a pencil or pen?	
50	18. During this first 10-minute segment has the teacher introduced the lesson content or information that he/she will cover during the class period?	No ___ Yes ___
51	19. How clear is the teacher in summarizing the content or material he/she will be covering during the period?	Not clear ___ Moderately clear ___ Very clear ___

Segment 2 — TEACHER AND PUPIL ACTION WITH MATERIALS (15 minutes)

In this segment, you first fill in the teacher checklist over the first 7 minutes. Then rest for 1 minute and identify the cluster of 4 pupils that you will observe. Then turn to the pupil checklist for the remaining 7 minutes. (For the reliability study, be sure the two of you agree on which 4 pupils you are both observing.) For both the teacher checklist and the pupil checklist, simply put a check or "X" in each appropriate box.

Teacher Action

Materials being employed	Chalkboard	Textbook	Supp. book	Teachers Guide	Exercise book	Manipulative	No material employed
20. Teacher is presenting lesson or information	a	b	c	d	e	f	g
21. Teacher is organizing lessons (distributing materials indicated)	8	9	10		11	12	
22. Teacher requiring entire class to recite set material	13	14	15	16	17		18
23. Teacher is reading material to entire class	19	20	21	22	23		
24. Teacher is writing material as pupils wait passively	24	25	26	27	28		
25. Teacher is writing material as pupils copy this material	29	30	31	32	33		
26. Teacher directs pupils to write something	34	35	36	37	38		
27. Teacher is making assignment for in-class exercises	39	40	41	42	43		
28. Teacher is assigning homework	44	45	46	47	48		
29. Teacher is saying nothing as pupils work at their seats	49	50	51			53	
30. Teacher is circulating around classroom monitoring pupils working at their seats	54	55	56	57	58	59	

Y1A

Pupils (4) Action

Materials being employed	Chalkboard	Textbook	Supp. book	Teachers Guide	Exercise book	Manipulative	No material employed
31. Pupils listening to teacher lecture	a	b	c	d	e	f	g
32. Pupils reading silently or out loud							
33. Pupils are writing something							
34. Pupils are waiting passively while another pupil is writing or reading material							
35. Pupils are waiting passively while the teacher writes something							
36. Pupils show the teacher their written exercises or material they have written							
37. Pupils begin to talk to each other							
38. One pupil is clearly inattentive for more than one minute							

Y1B

Segment 3 – TEACHER TALK AND QUESTIONS (10 Minutes)

For this segment focus on the teacher — especially on what the teacher is saying to, or asking of, pupils. During the first 4 minutes, tally the number of utterances of questions spoken by the teacher within each appropriate box:

	Teacher speaks to: Entire class	or Individual pupil or small group
39. Teacher is presenting lesson or material with no questions. (Each time the teacher turns back to the 'lecture mode,' tally this under column 1)	A	
40. Teacher speaks to discipline pupil(s), regain order, or to quiet down pupil(s).	a	b
41. Teacher requests pupil (s) to recite set material.	a	b
42. Teacher asks a question with just one correct factual answer.		
43. Teacher asks a question with more than one 'right answer,' requiring simple analysis by the pupil(s).		
44. Teacher responds to a question volunteered by a pupil.		
45. Teacher encourages discussion of a concept between two or more pupils.		
46. Teacher is moving about the class, reviewing exercises or seat-work of individual pupils (tally in column 2).		

** Research assistant: Now just rest 2 minutes before completing this same matrix appearing below.

After resting for 2 minutes, make the same tallies for the remaining 4 minutes of the segment.

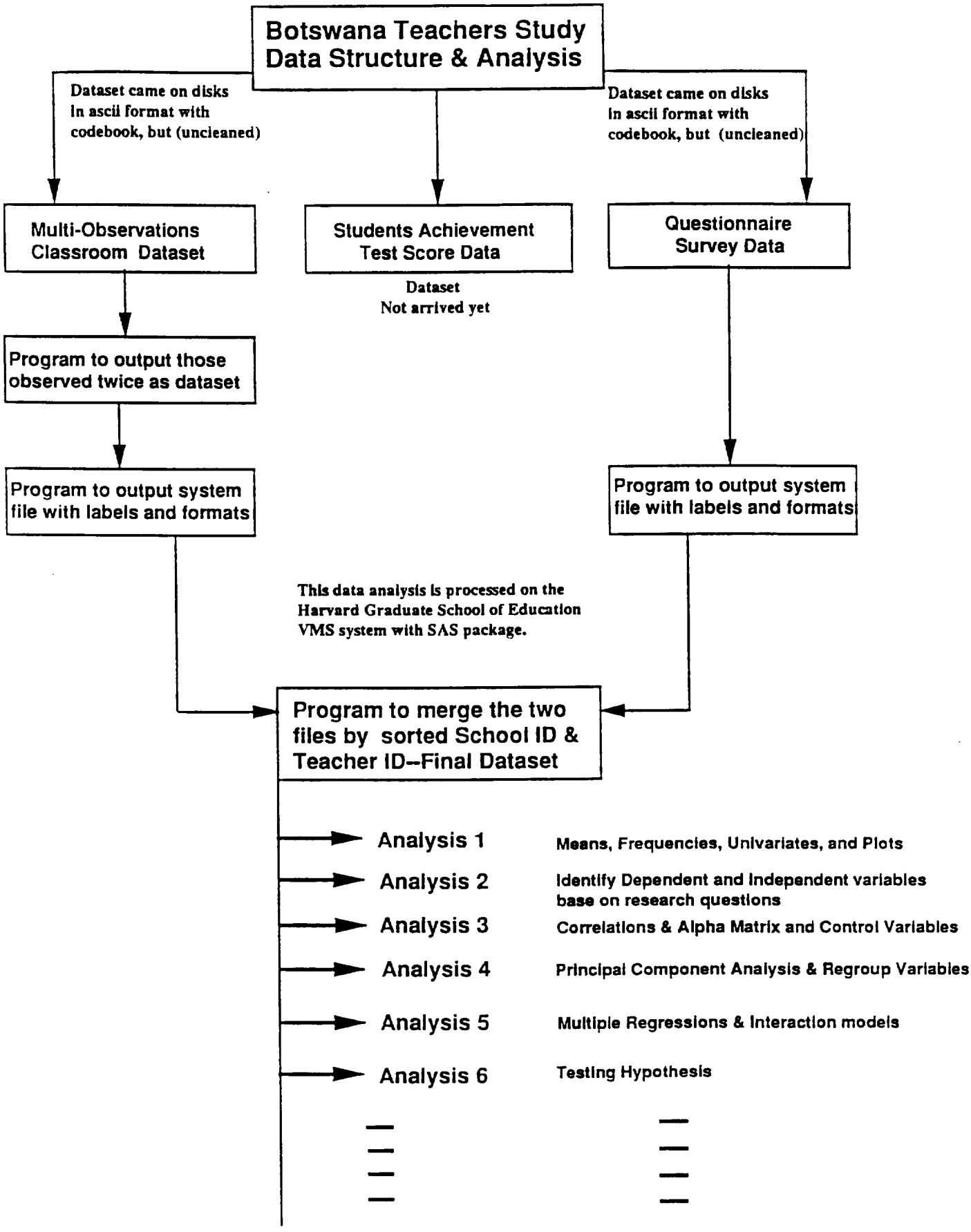
	Teacher speaks to: Entire class	or Individual pupil or small group
47. Teacher is presenting lesson or material with no question. (each time the teacher turns back to the 'lecture mode,' tally this under column 1)		
48. Teacher speaks to discipline pupil(s), regain order, or to quiet down pupil(s).		
49. Teacher requests pupil(s) to recite set material.		
50. Teacher asks a question with just one correct factual answer.		
51. Teacher aska a question with more than one 'right answer,' requiring simple analysis by the pupil(s).		
52. Teacher responds to a question volunteered by a pupil		
53. Teacher encourages discussion of a concept between two or more pupils.		
54. Teacher is moving about the class, reviewing exercises or seat-work of individual pupils (tally in column 2).		

Segment 4 – SUMMARY SCALES (5 minutes)

55. During this 40 minutes period did the teacher engage in the following behaviours? a. Provided an overview of what material would be covered during the period	No ___ Yes ___
b. Presented new material or information? (Ask teacher if not sure it's new material)	No ___ Yes ___
c. Asked pupils questions or assigned exercises to allow pupils to practice the material?	No ___ Yes ___
d. Reviewed with pupils what material was covered during the lesson?	No ___ Yes ___
56. Did the teacher break pupils into smaller work groups?	No ___ Yes ___
57. How did the teacher spend his/her time? (Your estimates must total 100%) - Organizing lessons, passing-out materials	%
- Disciplining pupils	%
- Taking roll, other administrative tasks	%
- Marking home work while pupils sit silently	%
- Lecturing or presenting material to the entire class	%
- Engaging the class in recitation or sentence completing drills	%
- Monitoring work of individual pupils	%
- Exercises at the seats	%
58. Percent of teacher's language time: (Must total 100%) - English	%
- Setswana	%
- Other: _____ (Indicate language)	%
59. Discipline emphasis: Control or student development?	Control ___ Student Development ___
60. Discipline and order in classroom during instruction?	Disorderly ___ Orderly ___ Overly strict discipline ___

Segment 5 - POST CLASS APPRAISALS (15 Minutes)

	None	Slight Amount		Moderate Amount		Considerable Amount		Great Amount
61. Clear objectives	0	1	2	3	4	5	6	7
62. Teacher elaboration and use of examples as required	0	1	2	3	4	5	6	7
63. Simple and straight forward presentation	0	1	2	3	4	5	6	7
64. Complexity of instructional approach	0	1	2	3	4	5	6	7
65. Lesson difficulty for students	0	1	2	3	4	5	6	7
66. Student uncertainty about lesson concepts	0	1	2	3	4	5	6	7
67. Pleasantness of classroom atmosphere	0	1	2	3	4	5	6	7
68. Teacher satisfaction	0	1	2	3	4	5	6	7
69. Student satisfaction	0	1	2	3	4	5	6	7
70. Teacher discomfort	0	1	2	3	4	5	6	7
71. Student discomfort	0	1	2	3	4	5	6	7
72. Student confusion	0	1	2	3	4	5	6	7
73. Student interest	0	1	2	3	4	5	6	7
74. Teacher enthusiasm	0	1	2	3	4	5	6	7
75. Student attentiveness to instruction	0	1	2	3	4	5	6	7
76. Student boredom	0	1	2	3	4	5	6	7
77. Monotonous presentation of material	0	1	2	3	4	5	6	7
78. Focus, direction, and goal orientation	0	1	2	3	4	5	6	7
79. Accurate, thorough presentation of content	0	1	2	3	4	5	6	7
80. Teacher preparation	0	1	2	3	4	5	6	7
81. Class organization	0	1	2	3	4	5	6	7
82. Logical presentation	0	1	2	3	4	5	6	7
83. Teacher sensitivity to student needs	0	1	2	3	4	5	6	7
84. Teacher use of feedback	0	1	2	3	4	5	6	7
85. Teacher use of informal assessment	0	1	2	3	4	5	6	7
86. Level of student initiative	0	1	2	3	4	5	6	7
87. Special notes:								


Botswana Teachers Study
Data Structure & Analysis
Dataset came on disks in ascii format with codebook, but (uncleaned)
Dataset came on disks in ascii format with codebook, but (uncleaned)
Multi-Observations Classroom Dataset
Students Achievement Test Score Data
Dataset Not arrived yet
Questionnaire Survey Data
Program to output those observed twice as dataset
Program to output system file with labels and formats
Program to output system file with labels and formats
This data analysis is processed on the Harvard Graduate School of Education VMS system with SAS package.
Program to merge the two files by sorted School ID & Teacher ID--Final Dataset
Analysis 1
Means, Frequencies, Univariates, and Plots
Analysis 2
Identify Dependent and Independent variables base on research questions
Analysis 3
Correlations & Alpha Matrix and Control Variables
Analysis 4
Principal Component Analysis & Regroup Variables
Analysis 5
Multiple Regressions & Interaction models
Analysis 6
Testing Hypothesis
BTCA Study 1989 Data and Analysis

December 20, 1991

Ms. May Rihani
Ms. Barbara Reese
Creative Associates International
5301 Wisconsin Ave. N.W.,
Suite 700,
Washington, DC 20015

Dear May and Barbara,

I am pleased to send you a draft report on my analysis of gender differences among teachers and their teaching practices in Botswana.

I hope that you and the USAID offices will find this empirical report helpful in discussions of alternative educational policies and in carrying out future projects in the sector.

It is unfortunate that our original funding level, agreed upon by USAID project officers, was subsequently cut. I have simply run out of time to further polish the report.

In addition, the achievement data (for female and male students) is just now arriving at Harvard. The punchline to this research, of course, is whether the presence and practices of female teachers (and males' pedagogy) lead to differential levels of achievement between girls and boys. As you know, the funding received for this effort does not allow us to continue the gender side of this analysis of actual achievement effects. I have already spent 25% more days on the project than we budgeted for.

Ideally, a simplified description of these findings could be presented and disseminated within the Botswana education community.

I have greatly appreciated your support throughout the life of this project. You really went 'beyond the call of duty' to make this happen. I wish you both wonderful holidays and another productive year.

Sincerely,

Haiyan Hua