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ABSTRACT

This paper contains the major comparative findings of an investigation undertaken to survey and precisely describe a number of classroom behaviors occurring within the Kindgom of Nepal and to determine how those behaviors differed from comparable U.S. classroom behaviors. Comparisons were made using the Beeby taxonomy of educational stages and Flanders interaction analysis categories. Some of the findings indicated that: (1) Nepalese students did not express their own ideas and opinions very frequently, and teachers made little use of student ideas. Nepalese teaching observed conformed to what many educators would consider to be traditional, teacher-dominated classes, interspersed with periods of recitation. (2) Nepalese teachers were found to focus more directly upon the presentation of content matter than did U.S. teachers. (3) U.S. teachers tended to ask longer questions, spent greater percentages of time giving directions, and generally exhibited more extended "indirect" as well as "direct" teacher influence than did corresponding Nepalese teachers. (4) The extent of "drill" was found to be similar in most comparable Nepalese and U.S. classes, as was the percentage of time students talked in response to teacher and the ratio of student and teacher talk. The study did not determine whether similarities and differences are unique to Nepal and the U.S. or whether they are more generally descriptive of behavioral similarities and differences between industrialized and "underdeveloped" countries, between western and Asian cultures, or between other permutations of social systems around the world. (JD)

A COMPARISON OF NEPALESE AND U.S. CLASSROOM BEHAVIORS

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Abstract

This paper contains the major comparative findings of an investigation undertaken to survey and precisely describe a number of classroom behaviors occurring within the Kingdom of Nepal, and to determine how those behaviors differed from comparable U.S. classroom behaviors. Comparisons were based upon measurements made using the Flanders Interaction Analysis Categories and Activity Categories Instrument. Classroom behaviors were found to differ between the two countries in ways suggested by C. E. Beeby's taxonomy of educational stages. A number of other behavioral differences, as well as similarities, not directly suggested by Beeby's taxonomy, were also identified.

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Introduction

At the present time, comparative educators have only vague ideas about how classroom behaviors vary from one part of the world to another. Although a few major attempts have been made to study similarities and differences in classroom behaviors between countries, these have apparently been limited to comparisons based upon relatively indirect observational techniques such as questionnaires (e.g., Adams, 1970; Comber & Keeves, 1973) whose ability to provide valid comparisons of classroom behaviors has been seriously questioned (see Pfau, 1976). Other less extensive studies, but ones based upon direct observation of behaviors made using category systems, have been limited to comparisons between more developed and "western" countries of the world (e.g., Tisher, 1970; Dahllof & Lundgren, 1970).[1]

This paper presents an overview of the major comparative findings of an investigation undertaken to survey and precisely describe a number of classroom behaviors occurring within the Kingdom of Nepal, and to determine how those behaviors differed from comparable U.S. behaviors.

The strategy employed in comparing the behaviors of teachers and students in these countries was a two-step procedure, similar to one suggested by Rosenshine and Furst (1973, p. 170). The first step was to determine if teaching in the two countries differed in ways suggested by existing theory --the concerned theory in this case being C. E. Beeby's taxonomy of educational stages (Beeby, 1966). The second step was to

determine, by exploration, what similarities and differences existed between classroom behaviors in the two countries which were not suggested by Beeby's taxonomy.

An outline of Beeby's taxonomy is shown in Table 1. This classification system, Beeby felt, was descriptive of stages in the growth of primary school systems.

Descriptive hypotheses suggested by the taxonomy during 1972, when this investigation was initiated, are shown below. These hypotheses were based upon the assumption that the Nepalese educational system was located at a lower numbered stage (according to the taxonomy) than was the U.S. educational system. The hypotheses are also limited to variables measurable by the two category systems chosen for use in the Nepalese survey.

A. Hypotheses Concerning FIAC Measurements made in Science, Mathematics, Language Arts, and Social Studies Classes

H_1--The percentage of teacher talk recorded using category 3 of the FIAC (i.e., accepts or uses ideas of students) will be higher in U.S. elementary school classrooms than in Nepalese elementary school classrooms.

H_2--The percentage of student talk recorded using category 9 of the FIAC (i.e., student talk-initiation) will be higher in U.S. elementary school classrooms than in corresponding Nepalese classrooms.

H_3--The pupil initiation ratios (PIR) of U.S. elementary school students will be higher than those of corresponding Nepalese students.

H_4--The content cross ratios (CCR) of Nepalese elementary school teachers will be higher than those of corresponding U.S. teachers.

H_5--The I/(I+D) ratios of U.S. elementary school teachers will be higher than those of corresponding Nepalese teachers.

TABLE 1

BEEBY'S TAXONOMY OF EDUCATIONAL STAGES

Stage	*Teachers*	*Characteristics*
I. Dame School	Ill-educated, untrained	Unorganized, relatively meaningless symbols; very narrow subject content—3 R's; very low standards; memorizing all-important.
II. Formalism	Ill-educated, trained	Highly organized; symbols with limited meaning; rigid syllabus; emphasis on 3 R's; rigid methods—"one best way"; one textbook; external examinations; inspection stressed; discipline tight and external; memorizing heavily stressed; emotional life largely ignored.
III. Transition	Better-educated, trained	Roughly same goals as stage II, but more efficiently achieved; more emphasis on meaning, but it is still rather "thin" and formal; syllabus and textbooks less restrictive, but teachers hesitate to use greater freedom; final leaving examination often restricts experimentation; little in classroom to cater for emotional and creative life of child.
IV. Meaning	Well-educated, well-trained	Meaning and understanding stressed; somewhat wider curriculum, variety of content and methods; individual differences catered for; activity methods, problem solving and creativity; internal tests; relaxed and positive discipline; emotional and aesthetic life, as well as intellectual; closer relations with community; better buildings and equipment essential.

(Beeby, 1966, p. 72)

H_6--The i/(i+d) ratios of U.S. elementary school teachers will be higher than those of corresponding Nepalese teachers.

H_7--The instantaneous teacher response ratios (TRR89) of U.S. elementary school teachers will be higher than those of corresponding Nepalese school teachers.

H_8--Differences will be found between major teaching patterns found within Nepal and the U.S.A., with many more (or all) Nepalese patterns representing those in which the teacher takes a very active and direct supervisory role (as in lecture patterns, drill and review patterns) and more U.S. patterns representing ones in which independent student thought is stimulated and student ideas developed.

B. Hypotheses Concerning ACI Measurements made in Science Classes

H_9--The activity ratios of U.S. elementary school science classes will be higher than those of corresponding Nepalese science classes.

H_{10}--The laboratory ratios of U.S. elementary school science classes will be higher than those of corresponding Nepalese science classes.

The first eight of these hypotheses concern measures of behavior based upon use of the Flanders Interaction Analysis Categories (FIAC), the first seven of which are defined and explained in Appendix A along with other FIAC variables studied. The ninth and tenth hypotheses are concerned with measures of behavior dependent upon use of the Activity Categories Instrument (ACI), which are defined and explained in Appendix B. These last two hypotheses were limited to science classes, for it was known that ACI comparisons could not be made of other subject areas due to a lack of comparable ACI data gathered in the U.S.A.

Method

Instruments

As discussed elsewhere (Pfau, 1976), category systems seem to provide a potential for making valid and precise cross-national comparisons not equaled by other techniques used to

measure and describe classroom behaviors. As a result several category systems were chosen for use in the survey of Nepalese classroom behaviors whose descriptions were then compared with corresponding descriptions of U.S. classrooms.

The Flanders Interaction Analysis Categories (FIAC) was selected for use in describing teacher and student verbal behaviors during whole class discussions (Flanders, 1970). This instrument is useful in analyzing patterns of initiation and response within the classroom (Flanders, 1970, p. 35). Four versions of the Activity Categories Instrument (ACI), which was originally developed by Caldwell (1967, 1968), were produced by researchers at Nepal's Institute of Education and used to describe nonverbal and verbal activities occurring within science, mathematics, language arts, and social studies classes.[2]

Outlines of these instruments are given in Tables 2 and 3.

Nepalese Sample

During 1974, under the sponsorship of Nepal's Institute of Education, a survey was made of classroom behaviors occurring when science, mathematics, language arts, and social studies classes were taught at the second, fifth, and ninth grade levels within Nepalese schools.

Using a stratified random selection technique, 26 schools at each grade level were selected from those located within central Nepal. Selected schools were visited by one of four

TABLE 2

FLANDERS INTERACTION ANALYSIS CATEGORIES

TEACHER TALK	1. ACCEPTS FEELING. Accepts and clarifies an attitude or the feeling tone of a pupil in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included. 2. PRAISES OR ENCOURAGES. Praises or encourages pupil action or behavior. Jokes that release tension, but not at the expense of another individual; nodding head, or saying "Um hm?" or "go on" are included. 3. ACCEPTS OR USES IDEAS OF PUPILS. Clarifying, building, or developing ideas suggested by a pupil. Teacher extensions of pupil ideas are included but as the teacher brings more of his own ideas into play, shift to category five. 4. ASKS QUESTIONS. Asking a question about content or procedure, based on teacher ideas, with the intent that a pupil will answer. 5. LECTURING. Giving facts or opinions about content or procedures; expressing his own ideas, giving his own explanation, or citing an authority other than a pupil. 6. GIVING DIRECTIONS. Directions, commands, or orders to which a pupil is expected to comply. 7. CRITICIZING OR JUSTIFYING AUTHORITY. Statements intended to change pupil behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
STUDENT TALK	8. PUPIL TALK--RESPONSE. Talk by pupils in response to teacher. Teacher initiates the contact or solicits pupil statement or structures the situation. Freedom to express own ideas is limited. 9. PUPIL TALK--INITIATION. Talk by pupils which they initiate. Expressing own ideas; initiating a new topic; freedom to develop opinions and a line of thought, like asking thoughtful questions; going beyond the existing structure.
	10. SILENCE OR CONFUSION. Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer

Note. There is no scale implied by the numbers indicated. Each number is classificatory; it designates a particular kind of communication event.

(Flanders, 1970, p.34)

TABLE 3

SUMMARY OF ACI INSTRUMENTS

ACI (Science)	ACI (Math)
1. Laboratory Experiences: Open-Ended 2. Laboratory Experiences: Structured 3. Group Projects 4. Student Demonstrations and Reports 5. Field Trips 6. Student Speaking 7. Teacher Questioning 8. Notebook Work 9. Teacher Demonstrations, Use of Audio-Visual Aids 10.0 Lecture 10.5 Teacher Dictating 10.6 Student Reading 11. Silence or General Havoc	1. Students and Visual Aids 2. Guided Problem Solving 3. Out-of-Seat Activities 4. Reporting 5. Chanting or Drill 6.0 Student Speaking, Miscellaneous 6.1 Student Asks Questions 6.2 Student Answers Question 7. Teacher Questioning 8. Teacher Correcting 9. Teacher Using Visual Aids 10. Lecture 11. Silence or General Havoc
ACI (Social Studies)	**ACI (Language Arts)**
1. - - - 2. Individual Practical Activities 3. Group Work or Projects 4. Reports 5. Field Trips 6. Student Speaking 7. Teacher Questioning 8. Notebook Work 9. Teacher Uses Audio-Visual Materials 10.0 Teacher Speaking 10.3 Teacher Writing on Blackboard 10.4 Teacher Reading 10.6 Student Reading 11. Silence or Confusion	1.1 Student Reading: Aloud 1.2 Student Reading: Silently 2. Student Writing 3. Student Group Work 4. Student Demonstration 5. Student Chanting 6.0 Student Explaining 6.1 Student Questioning 6.2 Student Answering 7. Teacher Questioning 8. Teacher Correcting Student Work 9. Teacher Demonstration 10.1 Teacher Telling and Explaining 10.2 Teacher Directing 11. Silence or General Havoc

specially trained teams of Nepalese classroom observers. One of the two observers in each team observed classes using the FIAC, and the other observed using the ACI instruments. Since it was planned that measurements resulting from use of the FIAC and the ACI (Science) would be compared with existing U.S. measurements, efforts were made to ensure that the Nepalese observers used these instruments as they had been used by U.S. researchers. This was done by training the observers until their usage agreed highly with my own (at a Scott coefficient of interobserver agreement of .85 or higher), and by determining that my own usage agreed highly with standardized usage of these instruments in the U.S.A. (again at a level of .85 or higher).[3]

Classes at the grade level of interest at each school visited were observed during a 3 to 4 day visit. Observations made during the first day were discarded, since it was felt that teacher and student behaviors that day might not be typical of those normally occurring. Only observations recorded during the second, third, and (occasionally) fourth day were later analyzed.

For each subject at each grade level observed, observational data were gathered at from 18 to 25 schools. This was less than the 26 schools selected, partly because the classes of some subjects were not taught during the visitation period due to a lack of qualified personnel, teacher absence for academic reasons, or due to sickness (but not, apparently, due to teacher avoidance of observation); because a few schools could not be visited in the time allotted; because science was not taught at some

schools; or due to other reasons.

The second grade teachers observed tended to have completed 9 or 10 years of formal schooling (including teacher training in some cases), while fifth grade teachers had completed from 10 to 12 years on the average, and ninth grade teachers from 12 to 14 years of formal schooling.

U.S. Sample

Existing descriptions of U.S. classroom behaviors were compared with results of the Nepalese survey. Criteria used to select the U.S. samples of behavior were mainly the following: (a) evidence existed which indicated that the FIAC or the ACI had been used in a standard manner, (b) the data was descriptive of the same subject studied within Nepal at the same or nearly the same grade level, and (c) the data represented observations made of relatively normal teachers and students.

Descriptive information gathered using the ACI existed for U.S. fifth grade science classes (Caldwell, 1968), but not for other subjects or grade levels.

In contrast, a great deal more information existed, descriptive of U.S. classroom behaviors, which had been gathered using the FIAC. Much of this, however, did not meet the selection criteria mentioned above. Sufficiently comparable samples were identified, though, so that a total of seven comparisons could be made, each descriptive of a particular subject at a particular grade level, for each FIAC variable studied. These samples are summarized in Table 4.

TABLE 4

SUMMARY OF NEPALESE AND U.S. FIAC SAMPLES COMPARED

Nepalese Sample	U.S. Sample
2nd grade mathematics	2nd grade mathematics (Flanders et al., vol.2, 1969)
2nd grade language arts	2nd grade reading and language arts (Flanders et al., vol. 2, 1969)
5th grade mathematics	6th grade mathematics (Flanders et al., vol.2, 1969)
5th grade language arts	6th grade language arts (Flanders et al., vol.2, 1969)
5th grade social studies . . .	6th grade social studies (Flanders et al., vol.2, 1969)
9th grade science	7th, 8th, & 9th grade science (Campbell, 1968)
9th grade mathematics	8th grade mathematics (Flanders et al., vol.2, 1969)

As Table 4 indicates, the U.S. data used was based upon observations made in U.S. classrooms during the 1960s. Information available indicated that these classes were taught by teachers who had completed 16 years of schooling (i.e., a U.S. bachelor's degree) and frequently some graduate work also (Flanders, vol. 2, 1969; Campbell, 1968).

Comparative Statistical Procedure

Statistical comparisons of Nepalese and U.S. means were made using the t test. In several cases when ordinal data was compared, the Mann-Whitney U test was used. One-tailed tests were employed to make statistically based decisions about the 10 hypotheses tested, while two-tailed tests were used when exploratory comparisons were made. All tests required a probability level of .05 or less to reject the null hypothesis of no differences between the measurements compared.

Results

Major Descriptive Findings of the Nepalese Survey

The survey conducted within Nepal revealed that Nepalese classes were dominated by teacher talk and by teacher ideas. Nepalese teachers were found to mostly lecture, and to frequently ask short, narrow questions which were usually followed by short and relatively predictable student responses. Nepalese students did not express their own ideas and opinions very frequently, and teachers made little use of student ideas. Few student activities were found to occur other than speaking (mostly in

response to teacher questions), some reading and writing, and the solving of mathematics problems. Little or no group work was observed, nor were field trips, student work with reference materials, student reports given to the class, or laboratory experiences in science. Nepalese teachers also made little use of audio-visual aids, except for the blackboard.

In short, the Nepalese teaching observed and statistically described, conformed to what many educators would consider to be traditional, teacher dominated classes, consisting mostly of "chalk and talk" interspersed with periods of recitation.

Testing of Hypotheses

Tables 5 to 10 summarize the major findings resulting when the Nepalese classroom behaviors were compared with those of U.S. teachers and students.

Comparison of the following variables, associated with the descriptive hypotheses tested, indicated that statistically significant differences existed between Nepalese and U.S. behaviors which were consistent with differences suggested by Beeby's taxonomy of educational stages: teacher acceptance or use of student ideas (H_1), student talk--initiation (H_2), pupil initiation ratio (H_3), content cross ratio (H_4), ACI activity ratio (H_9), and the ACI laboratory ratio (H_{10}). The I/(I+D) ratios (H_5) of Nepalese and U.S. teachers also differed as expected, except for mathematics classes where no significant differences were found, as did major teaching patterns (H_8) at the fifth grade level, but not at the second grade level where no differences were found.

TABLE 5

FIAC VARIABLES WHOSE MAGNITUDES TENDED TO BE SIGNIFICANTLY GREATER WHEN MEASURED IN U.S. CLASSROOMS

Predicted from Beeby's Taxonomy
FIAC Category 3: Accepts or Uses Ideas of Students
FIAC Category 9: Student Talk--Initiation
Pupil Initiation Ratio
I/(I+D) Ratio[a]
Identified by Extemporaneous Comparisons
Cell (3-3)
Extended Teacher Questioning
FIAC Category 6: Giving Directions
Extended Teacher Directions
Extended Teacher Criticism
Extended Indirect Influence
Extended Direct Influence
Cell (9-9)[b]
Pupil Steady State Ratio[c]
FIAC Category 7: Criticizing or Justifying Authority[d]

Note. Unless otherwise indicated, the U.S. mean magnitude of each variable was significantly greater than the corresponding Nepalese mean, for each of the seven comparisons made.

[a] With the exception of mathematics classes at all three grade levels compared, for which no significant differences were noted between the magnitudes characteristic of Nepalese and U.S. teachers.

[b] No significant differences were noted, however, between Nepalese and U.S. second grade mathematics class means.

[c] No significant differences were noted, however, between Nepalese and U.S. second grade language arts class means.

[d] No significant differences were noted, however, when U.S. and Nepalese second grade classes were compared, or when Nepalese ninth grade science classes were compared with U.S. classes.

TABLE 6

FIAC VARIABLES WHOSE MAGNITUDES TENDED TO BE SIGNIFICANTLY GREATER WHEN MEASURED IN NEPALESE CLASSROOMS

Predicted from Beeby's Taxonomy
Content Cross Ratio
Identified by Exploratory Comparisons
FIAC Category 2: Praises or Encourages[a]
Category 5: Lecturing[b]
Total Teacher Talk[c]

Note. Unless otherwise indicated, the Nepalese mean magnitude of each variable shown was significantly greater than the corresponding U.S. mean, for each of the seven comparisons made.

[a] No significant differences were noted, however, between the means of Nepalese and U.S. second grade language arts classes.

[b] No significant differences were noted, however, between the means of the Nepalese ninth grade classes and the U.S. classes compared.

[c] No significant differences were noted, however, between means of the Nepalese ninth grade classes and the corresponding U.S. classes compared, nor between Nepalese and U.S. second grade language arts means.

TABLE 7

FIAC VARIABLES WHOSE MAGNITUDES TENDED NOT TO DIFFER SIGNIFICANTLY BETWEEN U.S. AND NEPALESE CLASSROOMS

Identified by Exploratory Comparisons
FIAC Category 8: Student Talk--Response[a]
Total Student Talk[a]
S/(S+T) Ratio[a]
Instantaneous Teacher Question Ratio (TQR89)[a]
Drill[b]
FIAC Category 1: Accepts Feelings[c]

Note. Except as indicated otherwise, the Nepalese and U.S. mean magnitudes of these variables were not significantly different for each of the seven comparisons made.

(a) U.S. sixth grade language arts and social studies means of this variable, however, were significantly greater than comparable fifth grade Nepalese means.

(b) Nepalese second and fifth grade mathematics means of this variable, however, were significantly greater than comparable U.S. means.

(c) Statistically significant differences were noted, however, when three comparisons were made. In these cases, U.S. means were from .1% to .2% greater than corresponding Nepalese means--a very minor difference.

TABLE 8

FIAC VARIABLES WHOSE MAGNITUDES
VARIED LESS CONSISTENTLY THAN OTHERS COMPARED

In Contradiction to Predictions Based Upon Beeby's Taxonomy
i/(i+d) Ratio
Instantaneous Teacher Response Ratio (TRR89)
Identified by Exploratory Comparisons
FIAC Category 4: Asks Questions
FIAC Category 10: Silence or Confusion
Steady State Ratio (10x10)
Teacher Question Ratio (TQR)[a]

[a]This variable was difficult to classify. When U.S. and Nepalese mathematics and science classes were compared, no significant differences were noted in the mean magnitudes of the TQR. However, when language arts and social studies means were compared across countries, the U.S. means were significantly greater than corresponding Nepalese means.

TABLE 9

PERCENTAGES OF COMPOSITE MATRICES ANALYZED WHICH CONTAINED MAJOR TEACHING PATTERNS INDICATING THAT INDEPENDENT STUDENT THOUGHT WAS STIMULATED AND STUDENT IDEAS DEVELOPED

	Nepal (%)	U.S.(%)
Second grade classes		
Mathematics	0	0
Language Arts	0	0
Fifth and sixth grade classes		
Mathematics	0	7
Language Arts	0	3
Social Studies	0	27
Junior high school classes		
Science	0	10
Mathematics	0	0

Note. Any one of the following sequences of FIAC behaviors, when found to exist in a major teaching pattern, was considered to indicate that independent student thought had been stimulated and student ideas developed: 9-3, 9-3-9, or 8-3-9-3. The procedure used to identify major teaching patterns is described by Amidon and Amidon (1967c).

TABLE 10
RESULTS OF ACI COMPARISONS
BETWEEN FIFTH GRADE SCIENCE CLASSES

U.S. Mean Was Significantly Higher
Predicted from Beeby's Taxonomy
Activity Ratio
Laboratory Ratio
Identified by Exploratory Comparisons
Laboratory Experiences: Structured (Category 2)
Student Demonstrations (Category 4)
Library Research and Field Trips (Category 5)
Student Speaking (Category 6)
Teacher Questioning (Category 7)
Teacher Demonstrations (Category 9)
Nepalese Mean Was Significantly Higher
Identified by Exploratory Comparisons
Lecture (Category 10)
Silence or General Havoc (Category 11)
No Significant Differences Between Nepalese and U.S. Means
Identified by Exploratory Comparisons
Laboratory Experiences: Open-Ended (Category 1)
Group Projects (Category 3)
Notebook Work (Category 8)

That is, U.S. students were found to express their own ideas and opinions more than Nepalese students, and U.S. teachers were found to accept or make use of student ideas and opinions more than did their Nepalese counterparts. Nepalese teachers were also found to focus more directly upon the presentation of content matter than did U.S. teachers. When 8th grade science classes were compared, U.S. students were found to have engaged more in laboratory work and other "student-centered" activities,[4] than had Nepalese students.

The i/(i+d) ratios (H_6) and TQR89 (H_7) of Nepalese and U.S. teachers did not differ as expected, for when compared, no significant differences were found in most cases.

Exploratory Comparisons

Besides differences suggested by Beeby's taxonomy, a number of other statistically significant differences were found to exist when exploratory comparisons were made--as Tables 5 and 6 indicate. It was found that U.S. teachers tended to ask longer questions, spent greater percentages of time giving directions and giving them for longer periods at a time, criticized students for longer periods at a time, and generally exhibited more extended "indirect" as well as "direct" teacher influence (as defined by Flanders) than did corresponding Nepalese teachers. Most comparisons also showed that U.S. students tended to give significantly longer answers than Nepalese students; and U.S. language arts and social studies classes were characterized (in part) by greater percentages of time spent asking questions by the teacher (and similarly by higher TQR ratios). Nepalese classes were characterized by

more lecturing at the elementary grade levels (but not at the ninth grade level), and apparently by more teacher praise or encouragement given to students.[5] When ACI activities occurring in Nepalese and U.S. fifth grade science classes were compared, also found that students spent a greater percentage of time engaged in structured laboratory experiences, in giving demonstrations to the class, in working with reference materials, and speaking within the class. U.S. fifth grade science teachers also were found to have used audio-visual aids, including demonstrations, a great deal more than did their Nepalese counterparts.

A number of similarities were also discovered when Nepalese and U.S. classroom behaviors were compared. Perhaps the most striking of these similarities was the finding that the most frequently occurring sequence of behaviors in both countries measured by the FIAC was, by far, that of teacher questioning (FIAC Category 4) followed by relatively predictable student responses (FIAC Category 8). The extent of "Drill" was also found to be similar in most comparable Nepalese and U.S. classes, as was (in most cases) the percentage of time that students talked in response to the teacher (as measured by the FIAC Category 8), and the ratio of student and teacher talk.

Of the four different subjects compared using the FIAC, mathematics appeared to be taught the most similarly in both countries, although a number of significant differences in mathematics classroom behaviors were also noted.

Discussion

Results of the comparisons made indicate that classroom behaviors differ between Nepal and the U.S.A. in ways suggested by Beeby's taxonomy of educational stages. In retrospect, the lack of support accruing from comparisons made using the i/(i+d) and TRR89 ratios seems due to a poor selection of these variables as valid indices of behaviors which were suggested by the taxonomy, rather than due to Nepalese and U.S. behaviors which were inconsistent with the taxonomy--although it is realized that such ex post facto reasoning is hazardous.

The conclusion that these results are in general agreement with Beeby's conceptualization of differences between countries as expressed in his classification system, should not, however, be taken to impute undue importance to Beeby's taxonomy--for even Beeby regarded his four stages as "nothing more than a first rough-and-ready framework" on which could be built serious studies of the complex processes of growth (Beeby, 1966, pp. 51-52). However, the results of this investigation do indicate that Beeby's conceptualization does appear to be fairly accurate--at least as far as Nepalese and U.S. classroom behaviors are concerned.

The fact that most of the indices selected to measure the extent occurrence of behaviors suggested by Beeby's taxonomy actually did reflect differences which had been predicted is also judged to be a favorable indication of the construct validity of the measurement and comparative procedures used in

this investigation. Thus the logical suitability of category systems in general (as discussed by Pfau, 1976), and the FIAC and ACI in particular, for making valid cross-national comparisons of classroom behaviors (between the U.S.A. and Nepal at least), is complemented by empirical evidence.

The exploratory comparisons made during this investigation also revealed a number of other behavioral differences and similarities between teaching in Nepal and the U.S.A., in addition to those suggested by Beeby's taxonomy.

At this time it is not known whether the similarities and differences identified are unique to Nepal and the U.S.A., or whether they are more generally descriptive of behavioral similarities and differences between industrialized and very "underdeveloped" countries, between western and Asian cultures, or between other permutations of social systems around the world. Only additional investigations can determine the uniqueness or generality of the results found. It is hoped, however, that such investigations will be conducted so that (a) a more precise picture will evolve of classroom behaviors around the world, expressed in terms of increasingly refined taxonomies of classroom behaviors (perhaps operationalized using indices such as some of those used in this investigation), and more importantly (b) so that variables associated with the variance of behaviors between countries, and over time, can be systematically studied. Towards these ends, I would like to make known that the detailed statistical descriptions of Nepalese and U.S. classroom behaviors, upon which this paper is based, are available to interested scholars.

Notes

[1]Tisher (1970) compared pedagogical roles in the U.S.A., Australia, and New Zealand; Dahllof and Lundgren (1970) compared American and Swedish teaching.

[2]Caldwell's original ACI was modified slightly by L. B. Rayamajhi and R. H. Pfau and called the ACI (Science); the ACI (Math) was developed by S. K. Shrestha (1974); the ACI (Social Studies) was developed by S. S. B. Mathema; and the ACI (Language Arts) was developed by K. M. Pradhan.

[3]My usage of the ACI was checked against that of H. E. Caldwell, the developer of that instrument, by observing two science classes with him during January 1973. My usage of the FIAC was checked by listening for the first time to tape recorded classes contained in two Interaction Analysis Training Kits and comparing my recordings with those contained in the training manuals. (Amidon & Amidon, 1967a, 1967b).

The Scott level of .85 is considered to be a reasonable level of performance, according to Flanders (1967, p. 166).

[4]Student-centered activities were considered to be activities in which the teacher acts as a coordinator of learning experiences, whereas teacher-centered activities were considered to be activities in which the teacher was imparting knowledge. This usage was based upon Caldwell (1967, 1968).

[5]Observers within Nepal and the U.S.A. used the FIAC Category 2 (Praises or Encourages) slightly differently when making recordings. Thus, the differences found may represent only differences in instrument usage rather than actual differences in teacher praise or encouragement.

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DEFINITIONS AND EXPLANATIONS OF FIAC VARIABLES

1. FIAC Categor[y] [P]ercentages (Categories 1 to 10)

Each calc[ulation] represents the extent occurrence of a particular [c]ategory of behavior as a percentage of the total ca[tegory] [n]umbers recorded. Each was calculated by deter[mining] the percentage of total tallies occurring in the [appropriate] column of an FIAC matrix derived from observa[tions] [m]ade at a school. For example, this calculation [for] category 1 was determined as follows:

$$\text{Category 1 Percentage} = \frac{\text{Sum of Column 1}}{\text{Sum of Columns 1 to 10}} \times 100$$

Please N[ote] henceforth the "Sum of Column X" will be shortened [to] simply "Column X" in the formulas which follow. This sym[bol], in turn, represents the total frequency of that par[ticular] category of behavior which was recorded during th[e] classroom observations made at a school.

Similarly, [the] "Sum of Columns 1 to 10" represents the total num[ber] of category numbers recorded, or in short, "Total Ta[lly]".

2. Teacher Ta[lk]

This calc[ulation] represents the total percentage of teacher t[alk] which occurred during the periods of classroom inte[raction] recorded. It is calculated as follows:

$$\text{Teacher Talk} = \frac{\text{Columns 1 to 7}}{\text{Columns 1 to 10}} \times 100$$

3. Student Ta[lk]

This ca[lcu]lation indicates the total percentage of student [talk] which occurred during the periods of classroom in[ter]action recorded. It is calculated as follows:

$$\text{Student Talk} = \frac{\text{Columns 8 to 9}}{\text{Columns 1 to 10}} \times 100$$

4. S/(S+T) Ratio

This ratio is a measure of the relative amount of

student talk to teacher talk. It will be higher for classes in which students did more talking.

$$S/(S+T)\ \text{Ratio} = \frac{\text{Columns } 8 + 9}{\text{Columns } 1 \text{ to } 9}$$

I/(I+D) Ratio

This ratio indicates the relative amount of indirect teacher talk that occurred (i.e., Columns 1, 2, 3, and 4) compared to the amount of direct teacher talk that occurred (i.e., Columns 5, 6, and 7). This ratio will be higher when relatively more indirect behaviors occur. The ratio is calculated as follows (Flanders, 1969. Vol. 1, p. 74):

$$I/(I+D)\ \text{Ratio} = \frac{\text{Columns } 1 \text{ to } 4}{\text{Columns } 1 \text{ to } 7}$$

The I/(I+D) Ratio has also been called the "Big I/(I+D)" (Flanders et al., 1969, vol. 2, p. 27), and the "I/D Ratio" (Amidon & Amidon, 1967a, p. 4; Amidon & Flanders, 1971, p. 37; Bosch, 1972, p. 4; Payne, 1970, p. 36; Peek, 1970, p. 45).

i/(i+d) Ratio

This ratio eliminates the effects of Categories 4 and 5 (Asks Questions and Lecturing), but is otherwise similar to the I/(I+D) Ratio. Flanders defined the i/(i+d) Ratio as "an index which corresponds to the teacher's tendency to react to the ideas and feelings of the pupils" (1970, p. 102), but that definition was found to be somewhat misleading. The more use is made of student ideas, and the more praise or encouragement given by the teacher, compared to giving directions and criticism, the greater will be this ratio. This ratio is calculated as follows (Flanders et al., 1969, vol. 1, p. 74):

$$i/(i+d)\ \text{Ratio} = \frac{\text{Columns } 1 + 2 + 3}{\text{Columns } 1 + 2 + 3 + 6 + 7}$$

This ratio, in the past, has been called by a number of different names, including the "little I/(I+D)" and "the revised ratio" (Flanders et al., 1969, vol. 2, p. 27), the "Revised i/d ratio" (Amidon & Amidon, 1967a, p. 4; Payne, 1970, p. 36; Peek, 1970, p. 45), and when multiplied by 100, the "Teacher Response Ratio (TRR)" (Flanders, 1970, p. 102).

7. Extended Indirect Influence

This calculation indicates the extent to which the teacher used indirect influence for somewhat extended periods of time. That is, it indicates teacher tendencies to praise, encourage, and accept or use the ideas of students for longer than 3 seconds at a time, and to move from one of these types of behavior to another. It is calculated as follows (Amidon & Amidon, 1967a, p. [illegible]):

$$\text{Extended Indirect Influence} = \frac{\text{Cells } (1\text{-}1) + (1\text{-}2) + (1\text{-}3) + (2\text{-}1) + (2\text{-}2) + (2\text{-}3) + (3\text{-}1) + (3\text{-}2) + (3\text{-}3)}{\text{Total Tallies}} \times 100$$

Extended Indirect Influence has also been called "Sustained Expansive Activity" (Flanders et al., 1969, vol. 2, p. 75), and indicates the percentage of tallies which are found in area [illegible] of an FIAC matrix such as that shown in Figure A-1 on the next page.

8. Extended Direct Influence

This calculation indicates teacher tendencies to criticize and give directions for longer than 3 seconds at a time, and to move from one of these behaviors to the other. The greater this calculation, the more such behaviors occurred. It is calculated as follows (Amidon & Amidon, 1967a, p. [illegible]):

$$\text{Extended Direct Influence} = \frac{\text{Cells } (6\text{-}6) + (6\text{-}7) + (7\text{-}6) + (7\text{-}7)}{\text{Total Tallies}} \times 100$$

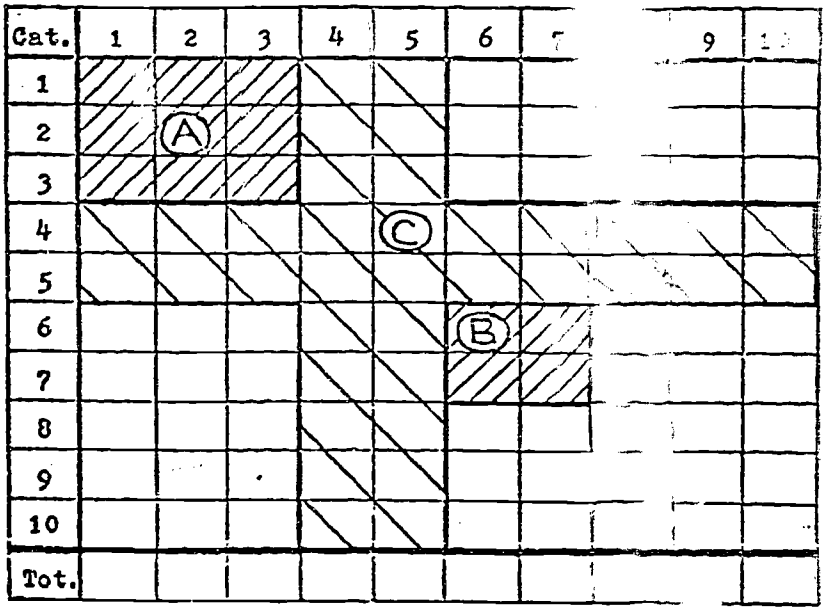
Extended Indirect Influence indicates the percentage of tallies which are found in area "B" of an FIAC matrix such as that shown in Figure A-1.

9. Steady State Ratio (10x10)

The Steady State Ratio (10x10) reflects the tendency of teacher and student talk to remain the same for periods lasting longer than 3 seconds. The higher this ratio is, the less rapid were changes from one of the 10 basic FIAC categories to another. It is calculated as follows (Flanders, 1970, p. 105):

FIGURE A-1

SELECTED AREAS OF FIAC M[illegible]



$$\text{Steady State Ratio (10x10)} = \frac{\text{Cell (1-1)} + \text{(2-2)} + \text{(3-3)} + \text{(4-4)} + \text{(5-5)} + \text{(6-6)} + \text{(7-7)} + \text{(8-8)} + \text{(9-9)} + \text{(10-10)}}{\text{Total Tallies}} \times 100$$

10. Pupil Steady State Ratio (PSSR)

The Pupil Steady State Ratio is an index reflecting the rapidity of the teacher-student interchange. The higher this ratio is, the more students expressed themselves in a sustained manner (Boscm. 1972, p. 10), for longer than 3 seconds at a time. It is calculated as follows (Flanders, 1970, p. 106):

$$\text{PSSR} = \frac{\text{Cells (8-8) + (9-9)}}{\text{Columns 8 + 9}} \times 100$$

11. Extended Teacher Questioning

Extended Teacher Questioning reflects the extent to which teacher questions were asked in an extended manner --for longer than 3 seconds at a time.

$$\text{Extended Teacher Questioning} = \frac{\text{Cell (4-4)}}{\text{Column 4}} \times 100$$

(This calculation and the next two, were inspired by Payne, 1970).

12. Extended Teacher Directions

Extended Teacher Directions reflects the extent to which teacher directions were given in an extended manner--for longer than 3 seconds at a time. The higher this ratio is, the longer were the directions given by the teacher.

$$\text{Extended Teacher Directions} = \frac{\text{Cell (6-6)}}{\text{Column 6}} \times 100$$

13. Extended Teacher Criticism

Extended Teacher Criticism reflects the extent to which teacher criticism was given in an extended manner--for longer than 3 seconds at a time. The higher this ratio is, the longer was the criticism given by the teacher

$$\text{Extended Teacher Criticism} = \frac{\text{Cell (7-7)}}{\text{Column 7}} \times 100$$

14. Pupil Initiation Ratio

The Pupil Initiation Ratio indicates what percentage of student talk was judged by an observer to be an act of initiation (Flanders, 1970, p. 102).

$$\text{Pupil Initiation Ratio} = \frac{\text{Column 9}}{\text{Columns 8 + 9}} \times 100$$

15. Content Cross Ratio (CCR)

This calculation indicates the percentage of all matrix tallies that lie within the columns and rows of Categories 4 and 5; that is, within area "C" of Figure A-1. A heavy concentration of tallies in this area indicates an emphasis on content by the teacher (Amidon & Flanders, 1971, p. 38). "An exceptionally high CCR is an indication that the main focus of class discussion was on subject matter, that the teacher took a very active roll in the discussion, and that attention to motivation and discipline problems was at a minimum"

(Flanders, 1970, p. 106). This calculation has also been called the "Content Cross" (Flanders et al., 1969, vol. 1, p. 75).

$$CCR = \frac{\text{Columns } 4 + 5 + \text{Cells } (4\text{-}1) + (4\text{-}2) + (4\text{-}3) + (4\text{-}6) + (4\text{-}7) + (4\text{-}8) + (4\text{-}9) + (4\text{-}10) + (5\text{-}1) + (5\text{-}2) + (5\text{-}3) + (5\text{-}6) + (5\text{-}7) + (5\text{-}8) + (5\text{-}9) + (5\text{-}10)}{\text{Total Tallies}} \times 100$$

16. Instantaneous Teacher Response Ratio (TRR89)

The TRR89 indicates teacher tendencies to respond to student talk with praise or encouragement, or by integrating student ideas into the class discussion, compared to teacher tendencies to criticize or give directions immediately after students stop speaking. Flanders defines the TRR89 as "the tendency of the teacher to praise or integrate pupil ideas and feelings into the class discussion, at the moment the pupils stop talking" (1970, p. 104), but that definition was found to be somewhat misleading. The TRR89 is calculated as follows (Flanders, 1970, p. 104):

$$TRR89 = \frac{\text{Cells } (8\text{-}1) + (8\text{-}2) + (8\text{-}3) + (9\text{-}1) + (9\text{-}2) + (9\text{-}3)}{\text{Cells } (8\text{-}1) + (8\text{-}2) + (8\text{-}3) + (9\text{-}1) + (9\text{-}2) + (9\text{-}3) + (8\text{-}6) + (8\text{-}7) + (9\text{-}6) + (9\text{-}7)} \times 100$$

This ratio has also been called the "Revised i/d ratio Rows 8 and 9" (Amidon & Amidon, 1967a, p. 44).

17. Instantaneous Teacher Question Ratio (TQR89)

This ratio indicates the tendency of teachers to respond to student talk with questions based on teacher ideas, compared to teacher tendencies to respond by lecturing (Flanders, 1970, p. 104). The higher this ratio is, the greater are teacher tendencies to respond with questions.

$$TQR89 = \frac{\text{Cells } (8\text{-}4) + (9\text{-}4)}{\text{Cells } (8\text{-}4) + (9\text{-}4) + (8\text{-}5) + (9\text{-}5)} \times 100$$

18. Teacher Question Ratio (TQR)

This ratio is defined as "an index representing the tendency of a teacher to use questions when guiding the more content oriented part of the class discussion" (Flanders, 1970, p. 102). That is, it indicates teacher tendencies to ask questions based on teacher ideas, compared to teacher tendencies to lecture. The higher this ratio is, the greater were teacher tendencies to ask questions.

$$TQR = \frac{\text{Column } 4}{\text{Columns } 4 + 5} \times 100$$

19. Drill

This calculation represents the percentage of tallies found within the (4-8) and (8-4) cells of an FIAC matrix. That is, it indicates the extent to which (a) student talk occurred in direct response to teacher questions, and (b) such student responses were immediately followed by a question based on teacher ideas. It is calculated as follows (Flanders et al., 1969, vol. 1, p. 75):

$$\text{Drill} = \frac{\text{Cells } (4\text{-}8) + (8\text{-}4)}{\text{Total Tallies}} \times 100$$

20. Cell (3-3)

Cell (3-3) indicates the degree to which a teacher accepted or used student ideas in a sustained manner --for longer than 3 seconds at a time. It is calculated as follows (Amidon & Amidon, 1967a, p. 45):

$$\text{Cell } (3\text{-}3) = \frac{\text{Cell } (3\text{-}3)}{\text{Total Tallies}} \times 100$$

This calculation has also been called "Sustained Acceptance" and the "(3-3) Cell" (Flanders et al., 1969, vol. 1, pp. 75 & 97).

21. Cell (9-9)

Cell (9-9) indicates the degree to which students expressed their own ideas and other talk which they initiated in a sustained manner--for longer than 3 seconds at a time. It is calculated as follows (Amidon & Amidon, 1967a, p. 45):

$$\text{Cell } (9\text{-}9) = \frac{\text{Cell } (9\text{-}9)}{\text{Total Tallies}} \times 100$$

DEFINITIONS AND EXPLANATIONS OF ACI (SCIENCE) RATIOS

1. Activity Ratio

The Activity Ratio is a measure of the relative amount of time spent teaching with student-centered activities (or indirect activities as Caldwell called them) compared to time spent teaching with teacher-centered (or direct) activities. The greater this ratio is, the more time was spent in student-centered activities.

$$\text{Activity Ratio} = \frac{\text{frequency of intervals assigned to categories 1 to 6}}{\text{frequency of intervals assigned to categories 8 to 10}}$$

(Caldwell, 1967, 1968)

According to Caldwell (1968, p.27) the Activity Ratio indicates whether a teacher is predominantly imparting knowledge, or acting as a coordinator of learning experiences. When the value of the Activity Ratio is greater than 1.00, the teacher used more student-centered activities than teacher-centered activities. When the value is less than 1.00, more teacher-centered activites occurred.

It might be noted that intervals assigned the Category Number 7 (Teacher Questioning) are not used when the Activity Ratio is calculated, since the effects of teacher questions are reflected by Category 6 (Student Speaking) (Caldwell, 1968, p.26). Intervals assigned the Category Number 11 (General Havoc or Silence) are also not used when calculating the Activity Ratio.

2. Laboratory Ratio

The Laboratory Ratio indicates the proportion of class time (other than General Havoc) during which the teacher engaged students in laboratory activities. This ratio is calculated as follows (Caldwell, 1967, 1968):

$$\text{Laboratory Ratio} = \frac{\text{frequency of intervals assigned to categories 1 and 2}}{\text{frequency of intervals assigned to categories 1 to 10}}$$

As can been seen, it is the ratio of time spent in laboratory activities to the total time spent teaching science (Caldwell, 1968, p.27).