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# VERBAL INTERACTION IN UNIVERSITY TUTORIALS

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**ABSTRACT**

This article reports on an attempt to describe the verbal interaction in a sample of 29 university tutorial groups. Methodological problems inherent in a study focussing on an educational process with a restricted sample size are discussed. The description then reports on the total verbal activity, compares the tutorial discussion with that coded in two classroom studies, and contrasts tutor and student behaviours. Tutor behaviour is then examined in more depth and, by clustering like tutor behaviours, six tutor roles are identified and described. These roles are labelled reflexive judge, data input, stage setter, elaborator, probe, and cognitive engineer. A brief exploration is made of relationships between these tutor roles and two kinds of criteria. One is the rating by students of the worth of the tutorials over the semester; the other is the use by students of different cognitive levels during the discussion. An indication is given of how the role descriptions have been utilized in short courses on small group teaching for tertiary teachers.

## Introduction

This paper describes in part a study of teaching in small groups where students were encouraged to take an active part in discussion. Although the term "tutorial" teaching is used to describe this activity in this study, perhaps "discussion class" (AVCC, 1963. p. 180) would be a more apt name. This form of teaching has enjoyed widespread approval over a number of years in universities both in Australia (AVCC, 1963) and elsewhere (Beard, 1970, p. 112) and lavish claims have been made by university administrators and teachers for the benefits of tutorial teaching (Mitchell, 1964; Beard, 1967).

Macquarie University, in which the present study was conducted, has a heavy commitment to small group teaching. Within the School of Education from which the sample for the present study was drawn, students spend, on average, about two-thirds of their formal instruction time in small groups. Commonly, this is divided between tutorials and some form of practical activity. Most of the tutorial time is given to group discussion based on stimulus material provided by lectures, by hand-out, by prescribed reading, or by initial oral presentation in the tutorial. Most groups comprise 10 to 12 students with a staff member assigned to each group as tutor.

Several reasons can be advanced for the growing interest in tutorial teaching in higher education. One likely reason is to counter the lack of staff-student contact resulting from large classes and the application of technology to education in the form of televised instruction, programmed instruction, and audio-tutorials. Several research studies (for example, Marris, 1964; McLeish, 1966; Schonell et al., 1962) have shown that students favour this mode of teaching.

Nevertheless, acceptance of small group teaching has come about largely without the guidance of research findings. Questions of the kind "What happens during tutorials?", "Are the objectives for tutorial teaching being realized?", and "How do different tutor behaviours influence outcomes in tutorials?" are important research questions requiring empirical data to answer them.

## Methodological Problems and Design Guidelines

The present study probably serves more to highlight the problems of designing research studies on university teaching than it does to answer the questions posed above. The following issues illustrate the kinds of problems encountered and the procedures adopted in this study in an attempt to cope with them.

### (A) NATURALISTIC SETTING

Small group research over the past 50 years has been prolific and renowned for its "empirical vigor" (McGrath and Altman, 1966, p. 49). Although several authors have proposed ways in which small group research findings might be applied in classrooms (for example, Henry, 1960; Miles, 1964), there are limitations to the extrapolation of such findings, most often derived from research in laboratory settings, to naturalistic tutorial teaching environments. The danger is not that the relationships from a laboratory setting may be invalid in a naturalistic setting. After all, their validity could be tested empirically. Rather the danger is that relevant variables in the naturalistic setting may be disregarded unless the research begins with an adequate description of the social phenomena being studied (Kounin et al., 1970, p. 148).

But the use of a naturalistic setting also carries several penalties, notably the loss of design rigour. Nevertheless, in the absence of descriptive data on the ecology of small group tutorials in tertiary institutions, this study aimed to furnish a quantitative description of interaction in a sample of naturalistic university tutorials.

(B) LACK OF CONTROL

The majority of studies on teaching in higher education have sought to achieve some experimental control by comparing equivalent groups undergoing different instructional treatments. Yet these comparative methods designs, many in the best Campbell and Stanley (1963) tradition, have been singularly unproductive. Dubin and Taveggia (1968) and Siegel (1967), in seeking to explain this "low empirical yield", identified lack of homogeneity within treatments and the inadequacy of terminal examinations when used as criteria as major contributing factors. In the present study, no attempt was made to compare tutorial teaching with other forms of teaching and learning. Rather an attempt was made to focus on the tutorial process, the teaching-learning "black box".

(C) DATA COLLECTION

Two methods of data collection are particularly appropriate to a study of social phenomena, namely, systematic observation and phenomenological reports. The observational technique was favoured for this exploratory study because of its greater objectivity. However, since observation is necessarily selective, considerable prior work was necessary to develop an appropriate observation schedule.

(D) CONCEPTUAL FRAMEWORK

With theories of teaching still in a formative stage, no one set of concepts is most suitable as a conceptual framework for research studies on teaching and learning in higher education. The present study regarded the tutorial as a social system and borrowed some of the role theory concepts to describe tutorial interaction. This paper uses some of the terminology without making the definitions explicit.

(E) DATA REDUCTION

Of necessity, reliable observation and quantification of complex behaviour requires the measurement of small and readily identifiable segments of behaviour. But this generates an enormous number of variables any one of which has little educational significance when taken in isolation. If a study is to identify relationships having some generality and parsimony, these segments of behaviour need to be grouped into larger, more meaningful patterns. This article describes an attempt to reduce 37 specific tutor behaviours into a smaller set of behaviour patterns. With the tutorial as the unit of analysis, the small number of tutorials studied (N = 29) imposed a further restriction on this form of data reduction. For this reason, cruder cluster analyses were preferred to a factor analytic technique to group tutor behaviours. In addition, two different clustering methods making somewhat different assumptions were used in an attempt to provide some cross validation of the clusters identified.

(F) THE CRITERION PROBLEM

In addition to describing what happened in tutorials, the study also attempted to relate this to selected criteria. One criterion was a product measure – ratings by students of the worth of the tutorials over the Semester. But delayed criteria of this kind are susceptible to contamination from several sources. As well, many of the objectives held for tutorials are stated in process terms, that is, in terms of the quality of the discussion within the tutorial. Hence a process criterion – the cognitive level of the student discussion – was included in this study as a second dependent variable.

(G) MULTIVARIATE RELATIONSHIPS

Analyses relating, for example, clusters of tutor behaviours to outcomes ought to be considered in multivariate terms. To report a series of univariate relationships between selected tutor behaviours and outcomes is to capitalize on chance relationships. On the other hand, to consider a complex of tutor behaviours in multidimensional space and to relate this to outcomes demands a sizable N. The present study examined both kinds of relationships and a selection of these is reported in this article. However, because of the restricted number of tutorials sampled, these analyses must be regarded as exploratory.

## The Sample and Data Collection

A sample of 29 different tutorial groups was selected for study from a pool of well over 100 groups in nine different undergraduate courses in education. The sample was selected to provide representativeness with respect to enrolments in different courses, in different years of courses, and in day/evening groups. Since one aim of the study was to describe tutor roles, it was desirable to include as many tutors differing on such factors as age, sex, and teaching experience, as possible. In all, 20 different tutors were included in the sample.

TABLE I

Sample of Tutorials Recorded

| Tutors recorded with one group | | | Tutors recorded with two groups | | | |
|---|---|---|---|---|---|---|
| | *Day* | *Evening* | | | *Day/day* | *Day/evening* |
| 100 level* | 6 | 2 | Same level | Same course | 2 | 2 |
| 200/300 levels* | 2 | 1 | | Different courses | 1 | 1 |
| | | | Different levels | | 1 | 2 |

* The 100, 200, and 300 levels can be translated approximately as the first, second, and third years of the undergraduate course.

Beyond the above requirements, groups were selected at random. Table I provides summary information on the sample selected.

Audio recordings of tutorial meetings, each 50 minutes in duration, were made approximately midway through the semester so that all groups had been meeting regularly prior to being recorded. Each group was recorded twice in successive weeks. Only the second recording was used for analysis on the assumption that the presence of the microphone would have lower reactive effects on the groups if they had been previously recorded.

Typed transcripts (typescripts) of the 29 tutorial meetings were produced and the verbal interaction was subsequently coded using these typescripts in conjunction with replays of the audio tapes.

## CODING OF TYPESCRIPTS

A multi-faceted coding schedule had been developed, trialled, and refined previously to a stage where acceptable inter-coder reliability coefficients were obtained. Observation schedules developed for research on small group interaction (for example, Benne and Sheats, 1948 and Bales, 1950) have found it necessary to separate task-oriented behaviours from those associated with group building functions or with the satisfaction of the needs of individual group members. Hence these were included as separate dimensions in the schedule developed for this study.

In addition, it was considered desirable to include a set of categories specifically designed to describe *teaching* behaviours. Well over 100 instruments have now been developed for use in classrooms. The one selected as most appropriate for this study (Bellack et al., 1966) coded the type of pedagogical move – four categories of structuring, soliciting, responding, and reacting. This had the added advantage that particular sequences of pedagogical moves could be identified and coded as *teaching cycles.*

In summary, the schedule involved coding on four major dimensions:

the identity of the speaker
– the type of pedagogical move (4 categories)
– a task function (21 categories)
– a group-building function (8 categories).

In addition, to obtain a measure of the extent of behaviour as distinct from its frequency of occurrence, the number of lines of typescript was also coded. The unit of analysis used for coding task and group-building functions was an analytic unit (as defined by Dunkin and Biddle, 1974) in that unit boundaries were determined by changes in categories. It was possible for one or more such units to occur within the one pedagogical move.

Finally, the discussion was also coded in terms of another dimension – its cognitive level (21 categories). This dimension was derived from the work of Bloom (1956), Gallagher and Aschner (1963), and Taba and Elzey (1964). The dimension was conceptually independent of the preceding dimensions and the occurrence of different cognitive levels was used as a process criterion in later analyses.

## Descriptive Overview of Tutorials

In terms of total activity, the 29 tutorial groups differed markedly. For example, although all recordings had a duration of 50 minutes, the number of uninterrupted utterances ranged from 81 to 380. There was also considerable variation in the mean lengths of utterances with a range from 1.36 to 3.96 lines per utterance. The data further revealed notable differences in tempos in tutorial activity. Thus tutorials characterized by longer utterances tended to be marked as well by slow and deliberate speech, often by pauses between speakers, and by a low volume of activity overall. In contrast, tutorials characterized by shorter utterances were marked by quick speech, frequent interruptions, and a generally fast tempo.

Table II shows the percentage distribution of pedagogical moves for the 29 tutorial groups combined. This table also shows comparative data from two classroom studies, one by Bellack et al. (1966) for 10th and 12th grade social studies classes in New York, the other by Power (1971) for 8th grade science classes in Brisbane. There was fairly close agreement between the two sets of school classroom data but the tutorial data revealed greater use of reacting moves at the expense of soliciting and responding moves. Inferences may be drawn about the relative lengths of the different moves by comparing the percentage of moves with the percentage of lines. Thus structuring

TABLE II

Distributions of Pedagogical Moves from Three Studies as Percentages of all Moves and Lines (or Time)

| | Sydney | | New York | | Brisbane | |
|---|---|---|---|---|---|---|
| | Undergraduate tutorial groups | | 10th and 12th grade classes | | 8th grade classes | |
| Pedagogical move | Moves | Lines | Moves | Lines | Moves | Time |
| Structuring (STR) | 5.5 | 10.6 | 5.4 | 17.6 | 5.7 | 20.1 |
| Soliciting (SOL) | 17.3 | 13.1 | 33.1 | 22.7 | 35.2 | 25.3 |
| Responding (RES) | 16.1 | 16.7 | 28.4 | 20.7 | 32.6 | 20.8 |
| Reacting (REA) | 61.2 | 59.5 | 30.0 | 37.7 | 26.5 | 25.3 |
| Not coded | | | 3.1 | 1.3 | | 8.5 |
| Total | 100.1 | 99.9 | 100.0 | 100.0 | 100.0 | 100.0 |

Sydney: f (moves) = 7,387
f (lines) = 13,753
New York: f (moves) = 15,475
f (lines) = 42,556
Brisbane: f (moves) = 4,826

moves tended to be longer than the other kinds of moves although the difference was not as great in tutorials as it was in school classrooms. Soliciting and responding moves were relatively longer in tutorial groups than they were in the school classrooms reported.

Data collected in school classrooms have indicated the dominant role of the teacher in the verbal interaction. Thus the study by Bellack et al. (1966) reported teachers making 61.7 percent of the pedagogical moves within the discourse, or 72.1 percent of the lines of typescript. Power's (1971) data reported teachers making 67.0 percent of the pedagogical moves and speaking 72.9 percent of the time. Table III shows the extent of tutor and student talk by moves and by lines of typescript in this study. Making 34.5 percent of the moves and accounting for 35.3 percent of the lines of typescript, tutors still occupied a dominant role although they spoke far less than their counterparts in the school classrooms.

The total verbal activity for tutors and for students is further divided into types of moves in Table IV. Evident here is the contrast between tutor

TABLE III

Extent of Tutor and Student Talk over the 29 Tutorial Groups

| Description | $\Sigma X$ | $\bar{X}$ | S.D. | Range | Percentage |
|---|---|---|---|---|---|
| Tutor talk (moves) | 2,551 | 88.0 | 29.6 | 49–146 | 34.5 |
| Student talk (moves) | 4,836 | 166.8 | 61.5 | 49–316 | 65.5 |
| Total | 7,387 | | | | 100.0 |
| Tutor talk (lines) | 4,858 | 167.5 | 47.2 | 59–258 | 35.3 |
| Student talk (lines) | 8,895 | 306.7 | 92.5 | 171–530 | 64.7 |
| Total | 13,753 | | | | 100.0 |

TABLE IV

Distributions of Numbers of Pedagogical Moves of Tutors, Leaders, and Other Students

| Pedagogical move | Total $f$ | Total % | % of moves by tutor | % of moves by leader | % of moves by other students |
|---|---|---|---|---|---|
| Structuring (STR) | 404 | 100.0 | 67.3 (86.0)* | 14.9 | 17.8 |
| Soliciting (SOL) | 1,275 | 99.9 | 68.5 (86.0) | 4.9 | 26.5 |
| Responding (RES) | 1,190 | 100.0 | 13.2 (12.0) | 14.1 | 72.7 |
| Reacting (REA) | 4,518 | 99.9 | 27.6 (81.0) | 7.1 | 65.3 |

$f$(moves) = 7,387

* Figures quoted in brackets are data cited by Bellack et al., (1966) based on 12th and 10th grade classes in New York.

and student roles. In 23 of the 29 groups, designated students were responsible for presenting orally a prepared paper, or for presenting a hand-out which provided the basis for tutorial discussion. In the ensuing discussions, the extent to which these students assumed leadership functions varied considerably. However, to aid interpretation of the data in Table IV, these students have been designated "leaders" and their moves are shown separately.

Tutors tended to dominate the structuring and soliciting moves being responsible for 67.3 and 68.5 percent of these respectively. Although these figures were lower than those reported in the Bellack classrooms study, they nevertheless followed a similar pattern. Responding moves were dominated by students with the tutor being responsible for 13.2 percent of responding moves. This again paralleled the pattern in the original Bellack study. However, it was in the distribution of reacting moves that the tutorial study differed from the classroom study. Tutors accounted for 27.6 percent of reacting moves as compared with 81.0 percent recorded by Bellack for classroom teachers.

The pattern of the distribution of moves can also be considered *within* tutor and student talk. Table V shows the percentages of total tutor moves and tutor lines devoted to structuring, soliciting, responding, and reacting. Comparative figures are shown for the New York and Brisbane studies. Tutors asked a lower proportion of questions (soliciting moves) and used a higher proportion of reacting moves than did teachers. However, tutor questions were relatively longer so that on percentage of lines of typescript the correspondence between tutors and New York teachers was quite striking.

In general, then, tutor and student roles were complementary. Tutors

TABLE V

Comparative Data on Tutor and Teacher Moves from Three Studies

| | Sydney | | New York | | Brisbane | |
|---|---|---|---|---|---|---|
| | Undergraduate tutorial gps | | 10th and 12th grade classes | | 8th grade classes | |
| Pedagogical move | % of T. moves | % of T. lines | % of T. moves | % of T. lines | % of T. moves | % of T. time |
| Structuring | 10.7 | 21.1 | 7.7 | 20.1 | 8.2 | 27.2 |
| Soliciting | 34.3 | 25.7 | 46.6 | 28.0 | 50.1 | 33.3 |
| Responding | 6.2 | 6.6 | 5.5 | 6.8 | 2.7 | 4.9 |
| Reacting | 48.9 | 46.6 | 39.2 | 44.7 | 39.0 | 34.6 |

accounted for a high proportion of structuring and soliciting moves but students dominated responding and reacting moves. Tutors accounted for more than one third of the total talk and exercised considerable control over the tutorial discussion. The similarities in distributions of moves of tutors and teachers across widely different teaching-learning environments does suggest that teaching behaviour is characterized by a set of common elements. However, one final point should be noted here. On almost all of the behaviour variables measured, the dispersion in tutor scores was found to be much greater than that reported for teachers. Perhaps this reflected the greater autonomy afforded the university tutor or perhaps it simply reflected the wider background and training (or lack of it) experienced by tutors. In any case, it did suggest that a search for behaviourally differentiated tutor roles was a viable one.

**Behaviourally Differentiated Tutor Roles**

Application of the coding schedule to the group discussions generated scores on a large number of tutor behaviours. As noted earlier, differentiation between tutors on specific behaviours was of little use unless these data could be reduced into clusters of more inclusive concepts and relationships. The set of tutor behaviours included scores on pedagogical moves, task functions, and group-building functions as well as some measures of frequency and extent of tutor talk, and of tutor initiation of teaching cycles. These variables were generally operationalized in two ways – in absolute terms as a frequency of occurrence and in relative terms as a proportion of the total set of like behaviours for the tutor. Where categories occurred infrequently, they were either combined with other categories (where pedagogical significance and empirical relationship suggested this was appropriate) or they were omitted. The final set comprised 37 variables and these were considered to give an adequate mapping of the total tutor verbal behaviour space.

Meux (1967) has drawn attention to the problem of applying factor analytic methods to classroom observation data where frequently the number of variables exceeds the number of classrooms which can feasibly be included in the study hence violating an assumption of the factor analytic method. Hence in the present study, cruder methods of cluster analysis were preferred to group tutor behaviours. It should be remembered that the purpose here was one of data reduction rather than of data analysis per se. From a host of possible clustering routines, two were selected because they made somewhat different assumptions thus allowing some cross-validation of the clusters which emerged. The two methods used were:

– a method of cluster analysis called Hierarchical Classification by Reciprocal Pairs (McQuitty, 1964); and
– a method of Hierarchical Grouping Analysis (Veldman, 1967).

The former method is one of a number of routines developed by McQuitty over a number of articles in the journal *Educational and Psychological Measurement.* It begins with a matrix showing indices of association (correlations were used in the present study) between all pairs of items. Pairs of items having their highest indices with one another are identified as "reciprocal pairs". A new second order matrix is then formed in which each of the reciprocal pairs from the first matrix is treated as one member in the new matrix. Thus in the present study, the 37 × 37 matrix yielded 11 reciprocal pairs. Hence when these pairs were combined in the next matrix, this resulted in a 26 × 26 second order matrix. McQuitty suggested three ways of computing new indices of association and the *similarity index* (as defined by McQuitty, 1966) was used in this study. In similar fashion, higher order matrices are produced and the clusters are built up in hierarchical fashion.

The second method of grouping tutor behaviours was based on the computer program provided by Veldman (1967) to effect a method of grouping suggested by Ward (1963). The method begins by defining as many groups as there are variables. These groups are then reduced in a series of steps with two groups being combined at each step. The criterion for the selection of the groups to be combined is that the total within groups variance will be minimally increased. The increment in this within group variation is a guide to evaluate the usefulness of additional groupings and a substantial increase can indicate that optimal grouping has been achieved.

The two methods revealed very similar patterns of related tutor behaviours and permitted the identification of six distinct behaviourally differentiated tutor roles. These were labelled as follows:

- reflexive judge
- data input
- stage setter
- elaborator
- probe
- cognitive engineer.

Of course, any one tutor should not be seen as belonging to only one of these categories. Rather any tutor should be seen as having a profile with scores across all six dimensions. Nevertheless, some tutors did register high scores on one cluster and low scores on all others. Perhaps some readers will recognize themselves or their colleagues in the descriptions which follow:

*(a) The reflexive judge*

This pattern was characterized by frequent talk and frequent reacting on the part of the tutor. This was associated with tutor use of encouraging and supportive behaviour but also with tutor use of qualifying statements. In general, then, the pattern was one in which the tutor continually evaluated student contributions. The evaluations were both supportive and corrective. That is, the use of qualifying statements tended to be associated with positive group-building functions rather than negative ones. Frequently the two behaviours occurred contiguously. Where tutors modified or corrected a student contribution, this was often followed almost immediately by tutor praise or encouragement for some other aspect of the contribution.

*(b) The data input*

In this behaviour pattern the tutor tended to answer questions posed by the group. The tutor used a high proportion of responding moves and spent a higher proportion of his time informing, opining, quoting, and narrating than did other tutors.

*(c) The stage setter*

This pattern was typified by frequent tutor use of structuring moves and a high proportion of tutor initiated teaching cycles. Also associated here were requests by the tutor to the group for data input. In this way the tutor set the stage for group discussion. When the particular scene had been acted out, he again structured and called for a new set of verbal props.

*(d) The elaborator*

This pattern was marked by frequent tutor elaborating and also by extended or prolonged periods of talk by the tutor. Also associated with this cluster, albeit weakly, were tutor behaviours of clarifying and coordinating.

*(e) The probe*

This cluster was characterized by frequent and extensive use of tutor soliciting and frequent tutor initiation of teaching cycles. Rather than give answers or solutions to questions or problems, the tutor redirected these to the group often with hints or clues to direct thinking. Weakly associated with this cluster were behaviours of a "gate-keeping" kind where tutors endeavoured to involve students when the discussion lagged.

*(f) The cognitive engineer*

In this pattern the tutor directed the group on to a new topic or oriented the group if it wandered from the topic being discussed. The tutor did not necessarily introduce the new topic himself but he did indicate clearly when it was time to move on. Although it occurred infrequently, tutor criticism of the way the group was tackling a problem or of its failure to define terms, was also associated here.

Of the 37 tutor behaviour variables used in the cluster analyses, only two failed to link with any of the patterns described above. It might also be noted here that tutors made very little use of negative group-building functions so that these were not included in the 37 behaviours. Even as a stratagem to encourage participation, outright disagreeing by tutors was rare. To what extent this reflected the nature of the discipline or the presence of the microphone is a matter for speculation.

## Tutor Roles Related to Criterion Measures

If the behavioural roles described above are to have educational significance, it is necessary to demonstrate functional linkages between the roles and educational criteria. Presented here are some exploratory analyses between the behaviourally differentiated tutor roles and the two kinds of criteria discussed earlier. The findings need to be interpreted with caution considering the limitations imposed by the very restricted sample.

TABLE VI

Mann-Whitney U Statistic for Tutors with High Scores (N=6) on the Six Tutor Roles as Compared with Remaining Tutors (N=22*) on Student's Ratings of the Worth of Tutorials

| Tutor | U | Significance for two-tailed test |
|---|---|---|
| Reflexive judge | 21 | $< 0.05$ |
| Data input | 47 | N.S. |
| Stage setter | 64 | N.S. |
| Elaborator | 40.5 | N.S. |
| Probe | 30.5 | $< 0.05$ |
| Cognitive engineer | 43.5 | N.S. |

A U statistic of $< 31$ required for significance at $p = 0.05$.

* One tutor was omitted because he was not the regular tutor for the whole Semester.

TABLE VII

Predictors to Ratings of Worth of Tutorials and Test of Significance Against Zero Prediction

| Predictor variable | Beta coefficient | $R$ | $F$ | $df$ | $p$ |
|---|---|---|---|---|---|
| Reflexive judge scores | 0.476 | 0.476 | 7.62 | (1,26) | 0.01 |

The remaining five tutor roles failed to enter the stepwise regression equation with the $F$-to-enter set at a 0.05 significance level.

*(a) The product criterion*

At the end of the semester, participating students were asked to rate the worth of the tutorials on a five-point scale. Mean ratings were determined for each tutorial group and used as the product criterion. The difficulty of relating criterion scores to the set of tutor role scores, given the small N, was discussed in an earlier section. One strategy used was to consider each tutor role in turn and to examine its relationship to the criterion. To do this, a high scoring group (N = 6) was identified on each behaviourally differentiated tutor role and compared with the remaining tutors on students' ratings of the worth of tutorials. A Mann-Whitney U statistic for two independent samples was used for the two tailed tests. As indicated in Table VI, the reflexive judge role clearly reached significance at a 0.05 level while the probing role was marginal. In each case, the direction was such that these tutors received higher student ratings on the worth of tutorials than did the remaining tutors.

Given a larger N, a more satisfactory way to relate tutor role scores to the criterion would have been to consider the complete tutor profile, the six dimensional space defined by the behavioural roles. Such an analysis is reported here briefly even with the restricted N. Tutor scores on the six roles were transformed to normalized standard scores and used as predictors in a step-wise multiple regression analysis.

Of the six potential predictors, only the reflexive judge scores entered the regression equation with the *F*-to-enter based on a 5 percent significance level. As indicated in Table VII, the *R* of 0.476 indicated that approximately 23 percent of the variance in ratings of worth could be accounted for in terms of tutor scores on this variable.

Thus in both analyses, tutor reflexive judge scores were positively related to students' rating of the worth of tutorials. The significant relationship for the high scoring group of probing tutors may be explained by some overlap between high scores on this pattern and those on the reflexive judge pattern. Thus two tutors identified in the first six ranks on the reflexive judge pattern were also placed in the first six ranks on the probing pattern. Similarly, a positive correlation between reflexive judge and probe scores would explain why the latter failed to emerge in a regression equation after the former had entered that equation.

*(b) The process criterion*

As a process criterion, students' use of different cognitive levels in responding and reacting during the tutorial discussion was employed. (Responding and reacting accounted for 89.0 percent of student moves). Three cognitive levels are considered here:

Level A: factual contributions, opinions.

Level B: lower cognitive level processing including translation, association, interpretation, generalization, logical and summary conclusions.

Level C: higher cognitive level processing including explanation, analysis, synthesis.

(The complete coding schedule for cognitive level included two other categories involving the application and evaluation of data. They are omitted here because they fit less clearly into the hierarchy defined by levels A, B and C.)

In view of the findings reported above for the product criterion, only the reflexive judge and probing tutor roles are considered here in relation to the process criterion. Table VIII compares tutors high in these two patterns with other tutors in relation to their students' use of the levels A, B and C in the discussion.

In the tutorials where tutors received high scores on the reflexive judge role, group members used a lower proportion of responding and reacting moves concerned with factual contribution and opinion and a higher proportion of moves involving lower cognitive level processing. Similarly, when the tutor had high scores on the probing role, group members used a lower proportion of moves at level A and higher proportions at levels B and C.

TABLE VIII

Frequencies of Use of Different Cognitive Levels by Group Members in RES and REA Moves Under Reflexive Judge and Probing Tutors

| Tutor as | Level A *f* | Level B *f* | Level C *f* | Total *f* | Chi-square | Signif. |
|---|---|---|---|---|---|---|
| reflexive judge (N = 6) | 333 (57.9)* | 151 (26.3) | 91 (15.8) | 575 (100) | 14.04 | < 0.001 |
| Remaining tutors (N = 23) | 1,381 (64.3) | 412 (19.2) | 354 (16.5) | 2,147 (100) | | |
| Tutor as a probe (N = 6) | 373 (56.2) | 167 (25.2) | 124 (18.7) | 664 (100) | 48.85 | < 0.001 |
| Remaining tutors (N = 23) | 1,341 (65.2) | 396 (19.2) | 321 (15.6) | 2,058 (100) | | |

* Figures in brackets are percentages of row totals included to facilitate interpretation.

## Conclusions

Principally this article has attempted to demonstrate both the need for, and the difficulty of, research focussing on the teaching-learning *process* in higher education. Scientific study of any observable phenomenon, be it the Moon's surface or tutorial discussion, ought to begin with an adequate description of that phenomenon. This article has considered a number of methodological problems facing educational researchers who adopt this approach. Within the obvious limitations imposed by these problems, this study has identified six tutor roles which, in the opinion of the author, provide a useful way of describing tutor behaviour. The article has also considered briefly some relationships between tutor roles and outcomes as indications of the kinds of relationships requiring further study.

On the assumption that varying emphases on the different roles may be necessary for the achievement of different objectives relating to tutorial discussion, we have made some use of the tutor role descriptions in short courses offered within the university on small group teaching at tertiary level. Participants have been made familiar with the role descriptions through the use of a model and through role playing. They have then been encouraged to analyze their own behaviour, as observed on a video-tape replay, in these terms. Finally, as a group, they have explored contexts in which varying emphases on the different roles were appropriate.

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