HOW TEACHERS TEACH
ANALYSIS OF VERBAL INTERACTION IN THE CLASSROOM

by

Gilbert L. De Landsheere
Head of the Department of Educational Research
University of Liege
Belgium*

In this paper, the system of interaction analysis developed in the Department of Educational Research of the University of Liege is first presented. Then, five research projects completed by the author or under his auspices are abstracted.

A. THE CATEGORY SYSTEM

Background of the system.

The basic idea of the author's system comes from M. Hughes and associates (1959). At first, a straight-forward French translation has been tried, but it soon appeared that Hughes' categories are neither exhaustive nor mutually exclusive. After analyzing several thousand pieces of teacher behavior, a new system (described hereunder) has been developed; each function is operationally defined.

Though words used are in many cases similar, the difference with Hughes' system is considerable:

- 4 out of the 7 Hughes' categories have been deeply revised;
- 1 has been suppressed;
- 3 have been added;
- M. Hughes et al. identify 28 specific functions; we have 40; 14 functions only are common to both systems.

Why a very analytical approach?

It seems that the high complexity of teacher-pupil interactions makes a very analytical approach necessary whatever the consequences may be in terms of coding load, length of observers training, and reliability.

The weakness of gross systems is illustrated by N. Flanders' well known category No. 3 in his non expanded system (Accepts or uses ideas of student), which in fact covers behavior categories as divergent (in terms of the author's system) as: development, imposition and positive feedback, and, within this latter category, feedback stereotype, repeat, specific, other.

One of the main factors explaining the general failure of research trying to relate teacher behavior to pupil achievement is the crudeness of the independent variables used.

---

*We have published this article using the American, rather than European, convention of commas in numerals between thousands and hundreds and periods between whole numbers and decimals.

Face validity of the categories.

Since a clear and educationally significant relationship (that is long term relationship) has not yet been satisfactorily demonstrated and measured between teacher behavior and pupil achievement, one has to rely mainly upon face validity of a category system.

We suggest that it should be observed in first place whether the teacher keeps the classroom situation under sufficient control: beyond a certain level, democracy becomes laissez faire, or even anarchy. In this case, efficient (individual or group) work is practically impossible.

Furthermore, attention should be focused on two behavior categories corresponding to the two main features of democratic education: for one thing, initiating the pupil to the existing culture (values, knowledge, skills, way of life, ...), which implies imposition, and, for another thing, giving him the opportunity to become an independent adult, which implies liberty, critical thinking, ...

Facilitating and reinforcing functions have also to be considered. All factors of reinforcement are not yet accurately identified, but we know enough to recognize the necessity of reinforcement of pupil behavior by the teacher.

Outline of the De Landsheere system.

I. Controlling functions.

Within this category, all functions creating favorable conditions for teaching or ordered working are grouped. These functions do not bear on subject matter, on substantive meaning.

1. Regulates pupils' participation (Open, closed, global, neutral, justified choice).
2. Controls movements in the classroom (Indicates where to go, authorizes move, does himself).
3. Controls implementation of work (Indicates lay-out, sequences; neutral control of work progress).
4. Judges in cases of altercations or conflicts of interest.

II. Impositive functions.

This category concerns subject matter only. The teacher is the one who decides upon the choice of subject matter, problems to be solved, and even response content and form.

1. Imposes information (lectures, answers his own questions).
2. Imposes problems.
3. Imposes the problem solving method.
4. Gives cues.
5. Imposes opinion or value judgment.
6. Imposes help.

III. Content development functions.

Basically the teacher responds to data placed in the situation by the pupils.

1. Stimulates (Creates stimulating conditions; suggests three or more activity choices).
2. Invites independent research.
3. Structures (Clarifies pupils' spontaneous statements; invites to clarify, develop, generalize, summarize, ...; suggests an experimental control; invites pupil to state opinion).
4. Meets request for help (Solves problem himself; guides pupil's research; gives information wanted).

IV. Functions of personal responses.

1. Welcomes a spontaneous participation.
2. Invites pupil to tell or report about personal experiences out of school.
3. Clarifies personal problem.
4. Individualizes teaching.

V. Functions of positive feedback to pupils.

These functions bear on subject matter only: the pupils are informed of the validity of their answers or problem solving behavior.

1. Approves - stereotype.
2. Approves by repeating pupil's answer.
3. Approves specifically.
4. Others.

VI. Functions of negative feedback.

1. Disapproves - stereotype.
2. Disapproves by repeating pupil's answer ironically or in accusing tone.
3. Disapproves specifically.
4. Feedback delayed.
5. Others.

VII. Functions of concretization.

Since the focus is on verbal interactions, not the use of teaching aids is observed, but the functions related. Methodologically, this category is a weakness in the system for it is not mutually exclusive with "imposition" and "development". A specific evaluation of the concrete approach at primary school level seemed important enough to justify a double coding.

1. Uses material (Figural representation; symbolic representation; construction).
2. Invites pupil to use material.
3. A-V.-aids (Used by teacher; by pupil).
4. Writes on the blackboard.

VIII. Functions of positive affectivity.

This is an evaluation of the pupils behavior, independently of specific subject matter.

1. Praises, mentions as a good example for others.
2. Solicitous.
3. Encourages.
4. Promises reward.
5. Rewards.
6. Shows sense of humor.
7. Words of affection (dear, honey, ...).

IX. Functions of negative affectivity.

1. Criticizes, accuses, irony.
2. Threats.
3. Admonish.
4. Reprimands.
5. Punishes.
6. Verbal futuristic.
7. Negative response personal.
8. Cynical.

B. RESEARCH OF G. DE LANDSHEERE WITH ASSISTANCE OF E. BAYER (1969)

Special effort has been made to control as many factors as possible:

1. Level: 50 first grade periods;
2. Population:
   a) Judgment sample of schools located in the different socio-economic quarters of Liege City and suburbs;
   b) Teachers randomly chosen;
3. Type of period observed: discussion on an activity theme. Each teacher was observed during two 30 minute periods. For the first period, the teacher was left entirely free; for the second period, all teachers agreed to organize interactions around the same theme: "We play with a magnet";
4. Time of observation: on a Thursday between 9:30 and 10 a.m.;
5. Reliability of coding tape recorded lessons: lower limit tolerated .85; mostly above .90.

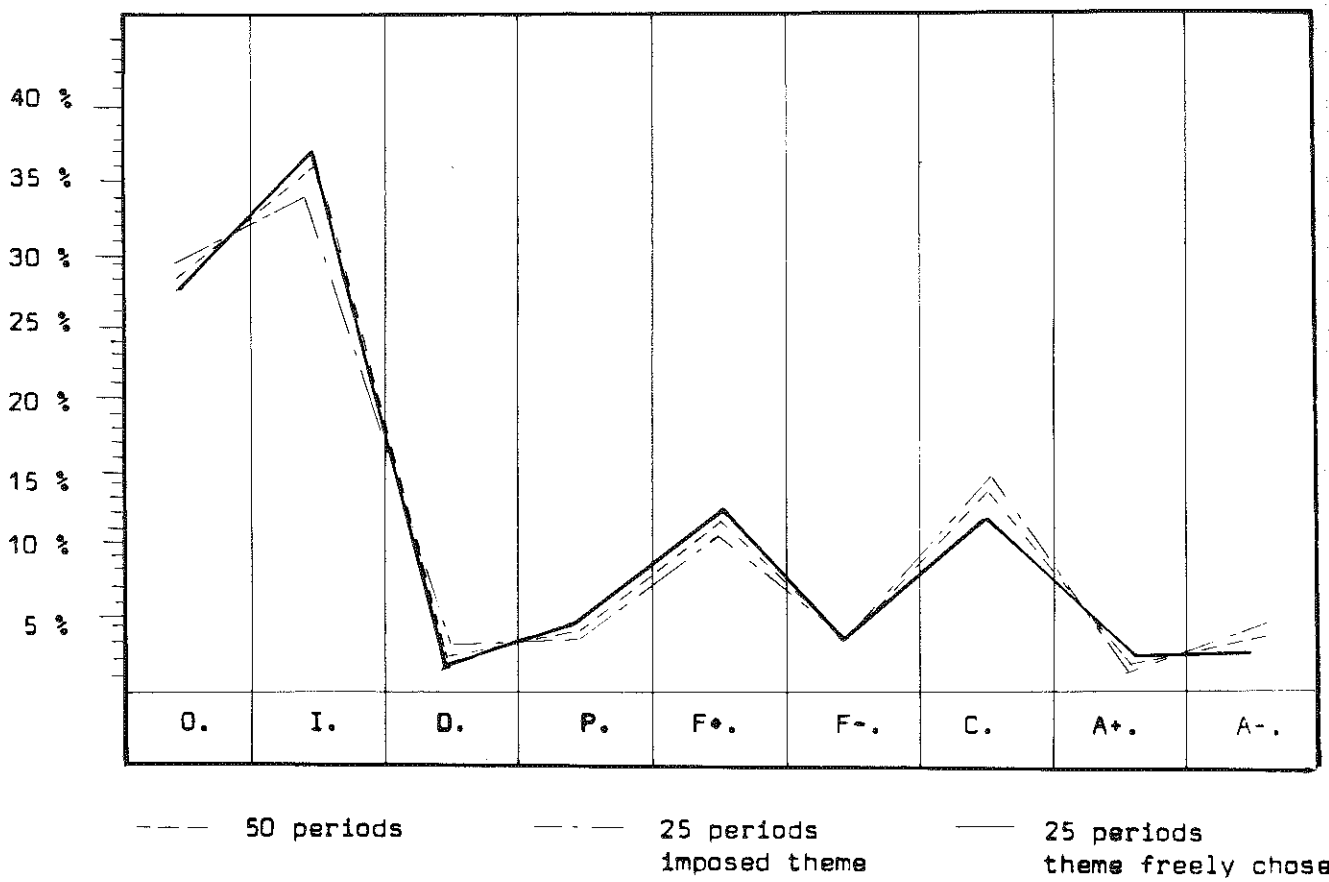
Results:

1. For the 50 lessons together, 21,929 functions have been identified.

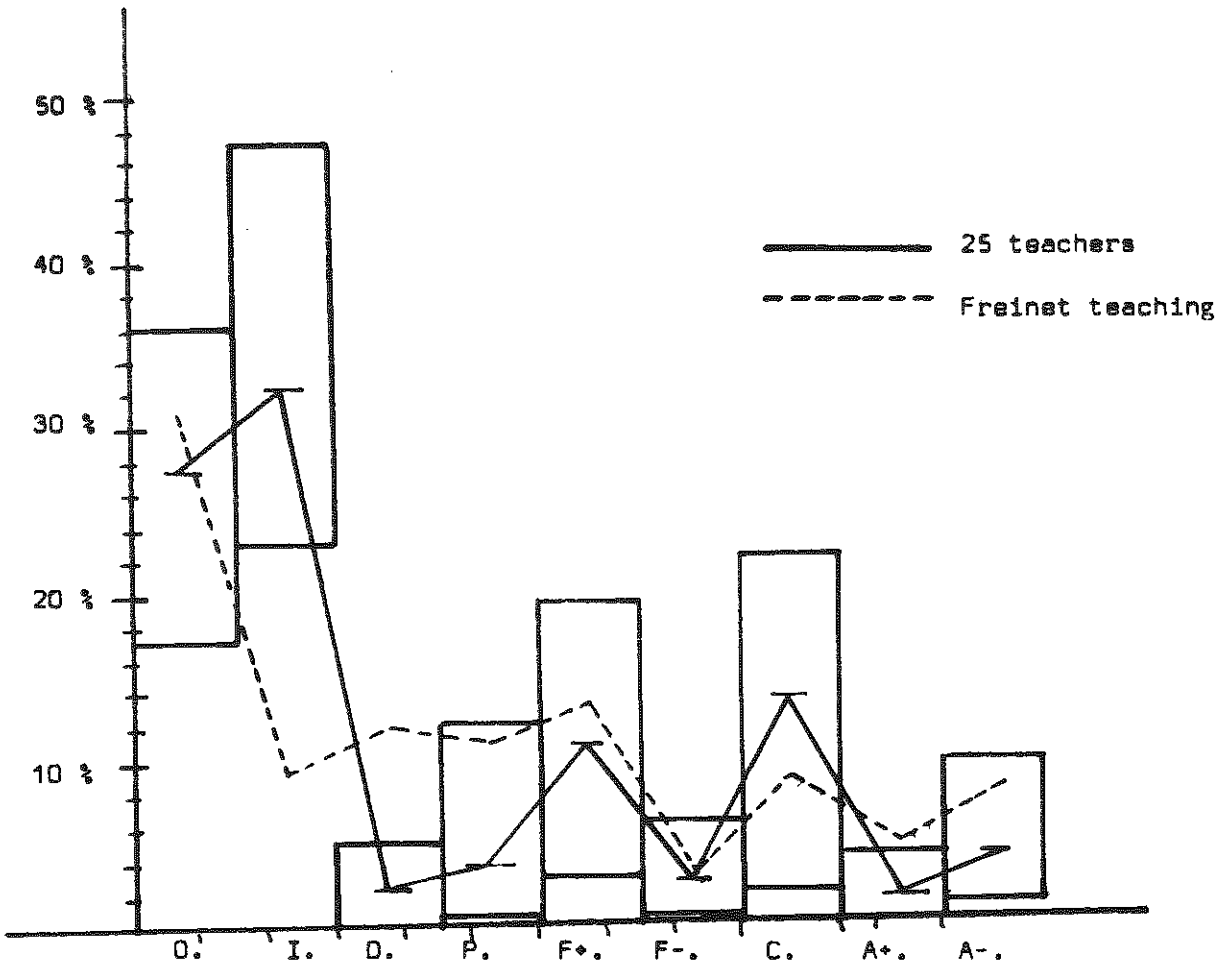
	Control	Imposition	Development	Personal responses	Feedb. +	Feedb. -	Concretization	Affect. +	Affect. -
n	5,931	7,568	452	815	2,498	592	2,925	304	844
%	27.0	34.5	2.1	3.7	11.4	2.7	13.3	1.4	3.8

2. A high correlation is observed: between the 25 profiles of the imposed theme activities (Kendall W = .84), between the 25 profiles of free themes activities (W = .84), between the 50 profiles together (W = .83).

Profiles



3. Such a high correlation might be caused by a lack of sensitivity of the instrument. However, when we observed a teacher, in another city, who practised the Freinet method (sort of project method), substantial differences appeared.



Other results:

1. Though the Belgian primary school curriculum is considered as one of the most progressive in the world since 1936, one observes that classroom instruction is definitely teacher centered:

Controlling functions	27.0%
Impositive functions	34.5%
Concretization by teacher	9.6%
	71.1%

2. Some subcategories bring striking information:
   a) Only in 225 cases out of 21,929 is the pupil invited to refer to his extra-school experience;
   b) Only 8.2% of the positive feedback functions are specific; 27.7% of the negative feedback functions are specific;
   c) No case of use of audio-visual techniques have been observed;
   d) Only in 26 cases has a pupil been concretely rewarded;
   e) Only in 7 cases has the sense of humor been observed with the teacher;

f) Only 4 cases of punishment have been observed;
g) A five minute random sample of each lesson would have been representative of the whole session. This observation will, however, be qualified in another research.

C. G. DE LANDSHEERE, Contrasted analysis of a five minute random sample from one of the 50 lessons mentioned above with the N. Flanders (non expanded) and with the De Landsheere system.

The five minute sample contained exactly 103 functions.

Flanders' categories

TEACHER	Indirect Influence	3. Accepts or uses ideas of student	13%	
		4. Asks questions	30%	43%
	Direct Influence	5. Lecturing-Rhetor. questions	2%	
		6. Directions	11%	20%
		7. Criticizing or justifying authority	7%	
PUPIL		8. Student Talk - response	17%	
		9. Student Talk - initiation	18%	

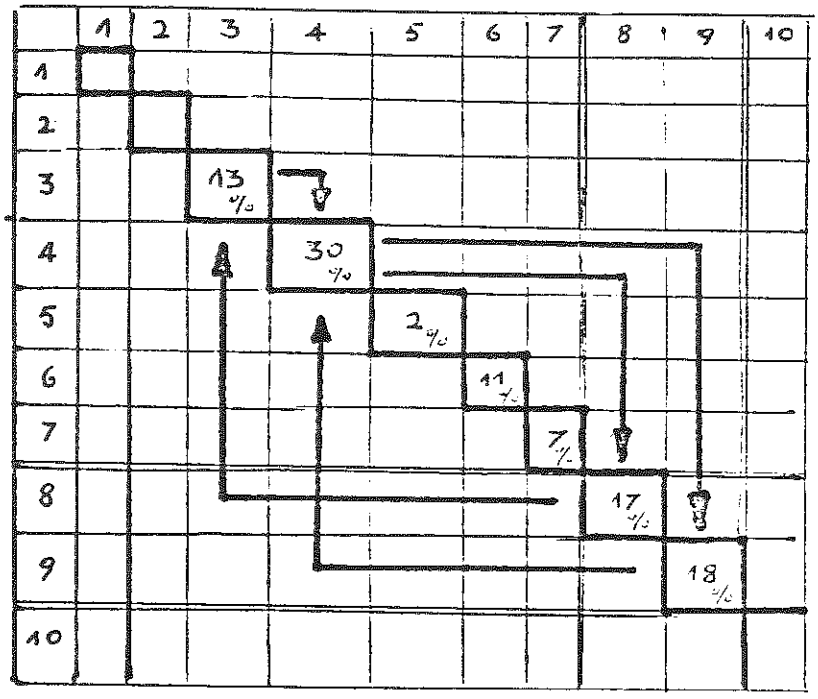
The same sample coded along the author's system lead to following results:

1.	Control	22%	
2.	Imposition	27%	
3.	Development	-	
4.	Personal responses	12%	
5.	Positive feedback	15%	
6.	Negative feedback	7%	
7.	Concretization	7%	(5% of which are teacher initiated)
8.	Positive affectivity	5%	
9.	Negative affectivity	5%	

Following observations can be made:

1. While the Flanders' system suggests that the sample analyzed is pupil centered: (Indirect influence = 43%) + (Category 9 + 18%) = 61%, our system indicates a teacher centered situation: (Control = 22%) + (Imposition = 27%) + (5% of concretization) = 54%;

ANALYSIS WITH FLANDERS' MATRIX



2. Flanders' category 3 corresponds at least to our categories 3 and 5:

   Flanders 13%
   De Landsheere 15% (but category 3 in this case = 0)

   So, in the present sample, what Flanders calls "Accepts or uses pupil's ideas" is exclusively "positive feedback" in our system. A further analysis shows that all positive feedback functions belong to the subcategory "feedback repeat": no one case of specific feedback exists in the sample.
   This is an example, that we do not generalize from this one observation, of how misleading a rather gross analysis can be.

3. In this case, Flanders' category No. 7 (7%) corresponds exactly to what we call negative feedback (7%). Normally, our category No. 9 (negative affectivity) would also enter Flanders' No. 7.

4. To explain our figure of 22% of controlling functions, it seems that we must add Flanders' No. 6 (11%) and No. 8 (17%).

This comparison, that has been purposely made very simple, suggests:

1. That two widely used systems of interaction analysis lead to dissimilar conclusions in terms of "teacher centered" versus "pupil centered instruction";

2. That some of N. Flanders' categories (specially 3 and 4) should be refined to convey a clearer idea of what is happening in the classroom.

		1	2	3	4	5	6	7	8	9	
Rewards Praises Affection	1										
Accepts spontaneous participation. Refers to out of school experi- ences. Independent research.	2										
Specific feedback	3										
Question - Problem	4										
Non specific feedback	5										
Question - Memory	6										
Rethorical Question Lecture	7										
Organization	8										
Criticizes Accuses Punishes	9										

3. That after some revision, the Flanders and De Landsheere systems could most probably be made compatible.

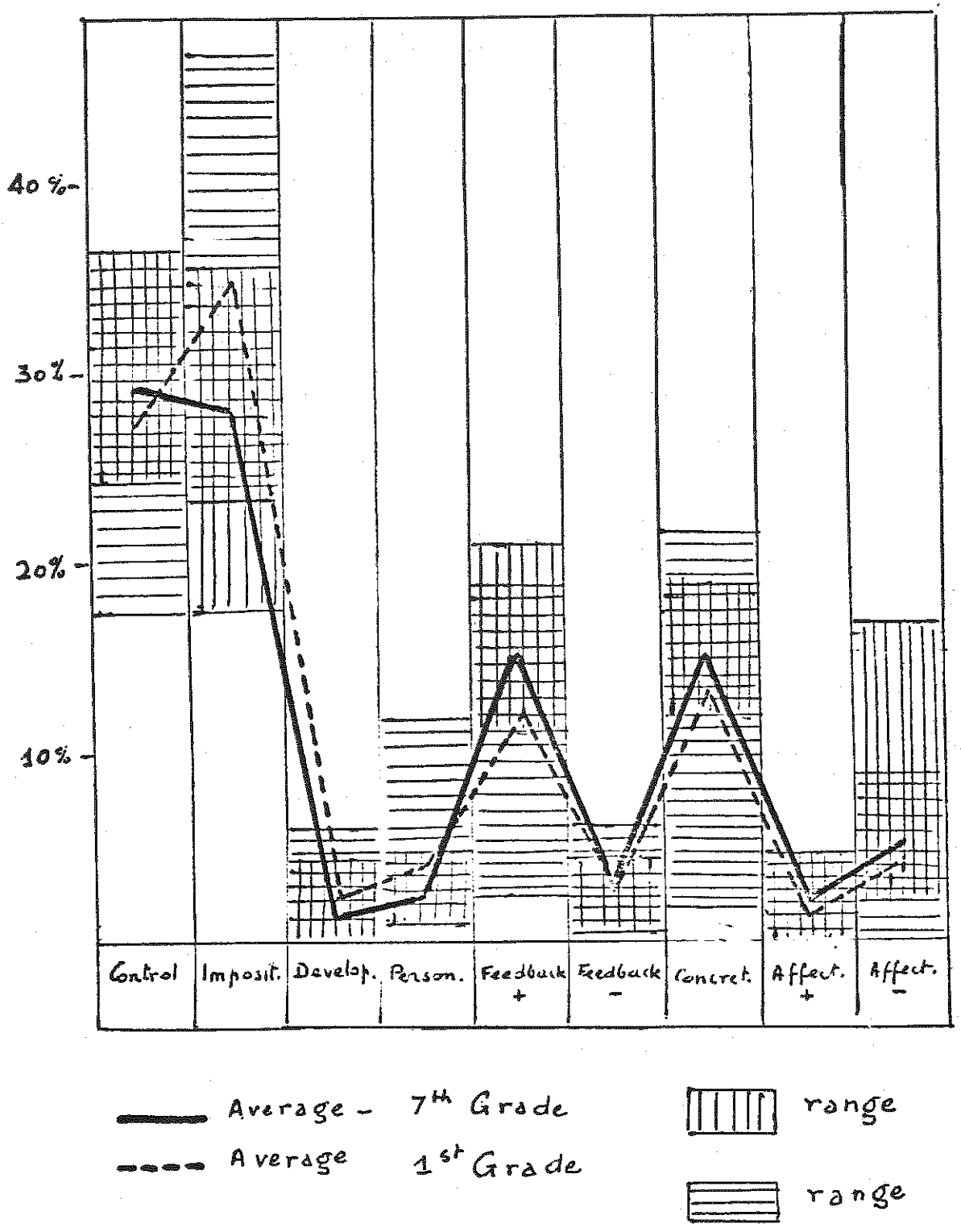
The author suggests the new matrix on the preceding page.

D. G. JACQUES, Analysis of 76 geography periods, in the 7th grade.

Total of functions identified: 11,333.
Duration of total observation: 800 minutes.
Rate: ± 1 function/4".

No.	Teacher	Topic	Remark
1 2	A	Relief	Twice the same lesson in different classes
3 4	B	Orientation	Two periods in the same class at a week's distance
5 6	C	Orientation	Two different lessons in two different classes
7 8	D	Orientation	Twice the same lesson in different classes
9 10	E	Types of farm buildings in Belgium	Id.
11 12	F	Orientation	Id.
13 14	G	Orientation	Id.
15 16	H	Orientation	Id.

As shown on following profiles, the overall results for geography are very similar to those obtained with the 25 first grade teachers studied earlier. The range of the geography teachers is much smaller in all categories.



In this case and with the exception of the first 10 minutes, each 10 minute subsample has no lower correlation with the whole period than .83.

Correlations for the first ten minute samples are:

.62; .82; .93; .83; .99; .97; .75; .62;
.98; .42; .97; .70; .95; .90; .65; .19.

Lower correlations are mostly explained by the introduction character of the first part of the period. The very low correlation of .19 is explained by the fact that the time was mostly used to go from the classroom to the play-ground where the observation was to take place.

Later research (see J. M. Martin), has confirmed that any 10 minute sample, except the first, is representative of the whole period.

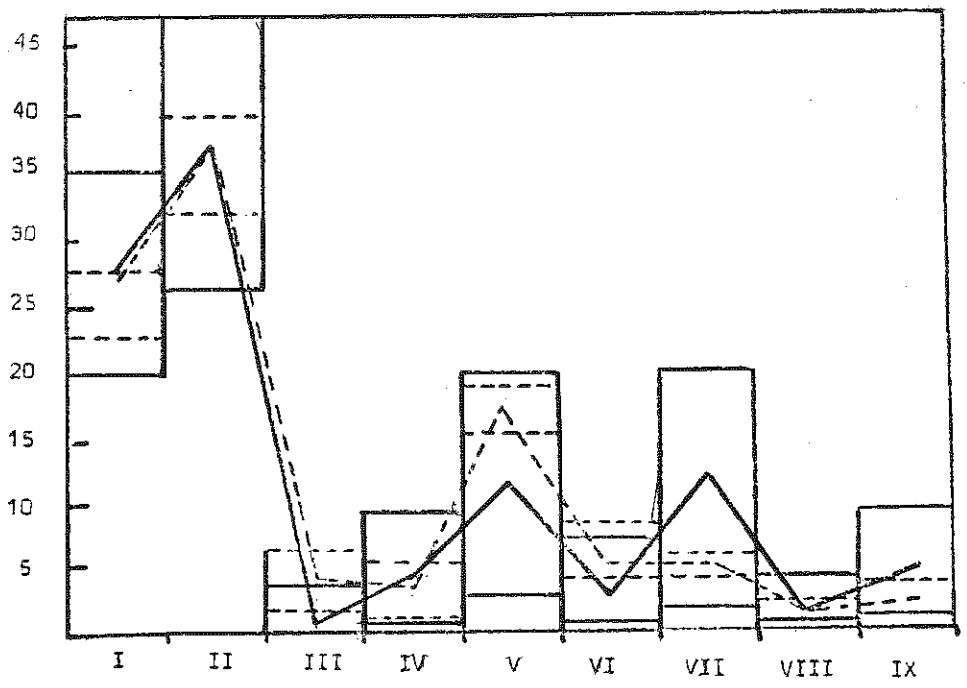
E. J. M. MARTIN, Systematic manipulation of the feedback of a first grade teacher.

One of the conclusions of G. De Landsheere et al. research is the great stability of teacher behavior. The generally poor quality of feedback behavior (stereotype or repeat) has also been repeatedly observed.

One of De Landsheere's hypotheses is that a higher quality of feedback (that is specific feedback functions) is only possible when the teacher tackles rather complex problems with the pupils; he furthermore suggests that an important part of the general profiles obtained in previous research projects would be changed parallelly with changes in the feedback category.

To test this, J. M. Martin has identified a definite teacher's basic profile. Then, he has familiarized him with our system of analysis of instructional behavior and invited him to introduce as much specific feedback as possible into his teaching.

This is first the basic profile as compared to the general average profile of the 25 teachers shown earlier.



New distribution of functions after the teacher was asked to introduce as much specific feedback as possible

Figures for six periods (B1 - B6)
Nine categories I - IX (feedback is V)

%

	I	II	III	IV	V	VI	VII	VIII	IX	
B1	24,1	31,7	7,1	4,7	19,2	4,6	3,6	3,5	1,6	N = 548
B2	25	31,5	5,9	4,2	18,4	4,4	5,2	2,9	2,5	N = 613
B3	30,2	31,9	7,8	1,7	19	3,5	3,5	1,7	0,9	N = 116
B4	23,5	33,6	4,2	8,4	20,2	3,4	3,4	1,7	1,7	N = 119
B5	25,5	40	3	4,9	16,4	2,4	4,9	1,8	1,2	N = 165
B6	28,2	34,8	5,3	4,4	18,7	2,6	3	1,3	1,5	N = 529

Distribution of feedback functions in six periods (A1 - A6) before the experiment.

Feedback in %

	Stereotype	Repeat	Specific	Other	N
A1	14,7	78,9	1,8	4,6	109
A2	13,6	77,3	-	9,1	22
A3	2,8	86,1	2,8	8,3	36
A4	7,1	89,3	-	3,6	28
A5	17,1	77,1	1,4	4,3	70
A6	9,3	86,7	-	4	75

Distribution of feedback functions in six periods (B1 - B6) after the teacher was asked to introduce as much specific feedback as possible.

	Stereotype	Repeat	Specific	Other	N
B1	10,5	66,7	20	2,8	105
B2	6,2	68,1	21,2	4,5	113
B3	18,2	59,1	18,2	4,5	22
B4	8,3	70,8	20,8	-	24
B5	22,2	70,4	7,4	-	27
B6	13,1	72,7	11,1	3,1	99

J. M. Martin's experience leads to following observations:

1. The total number of feedback functions has not varied significantly.

2. The teacher has been able to increase significantly his number of specific feedback functions; the feedback-repeat functions decreased approximately in the same proportion.

3. However, two restrictions must be made:

   a) The increase of specific feedback functions mainly took place in the first twenty minutes of the period.
   Hypothesis one: - Complex problems calling for specific feedback appear when the fundamental features of the lesson are introduced; the second part of the period is mainly focused on applications and drill, less favorable to high level feedback.
   Hypothesis two: Once he gets a bit tired, the teacher comes back to former routine;

   b) After a few experimental periods, it has been observed that the number of specific feedback functions decreased; the trend was to come back to the pre-experimental situation.
   Hypothesis one: Habits are strong and a sort of long educational therapy might be needed to change a teacher's behavior.
   Hypothesis two: The way we had more specific feedback introduced was superficial. Feedback behavior cannot be isolated from the whole pattern of instruction. This whole pattern must

be changed (for instance, from teacher centered to pupil centered instruction) if we want a lasting and functional modification of the feedback behavior.

4. A definite relation has been shown between specific feedback - imposition (negative) - development (positive).

5. Specific feedback generally follows interactions including an analysis of the situation.

6. This, of course, is an exploratory research. Its results can in no case be generalized. The only purpose is to show that the basic hypotheses are worth further endeavor.

F. NINANE, Analysis of teaching sessions on arithmetical problems, with the B. Bloom et al. taxonomy of educational objectives, cognitive domain - 6th grade.

Though no evaluative judgment has been made with the De Landsheere system, it seemed that the profile generally obtained was a symptom of rather poor teaching.

To test this hypothesis, a type of activity which seemed favorable for higher mental processes has been selected: arithmetical problems.

Number of 6th grade teachers observed: 9.
Duration of observation: 432 minutes.
Number of functions identified: 1,272.

Results: %

Teacher Nr	Taxonomy level*					
	I	II	III	IV	V	VI
1	33	35	8	3	6	12
2	34	30	10	7	3	17
3	42	31	15	-	1	11
4	44	37	15	-	-	4
5	38	35	25	-	-	2
6	55	23	19	-	-	4
7	37	48	13	-	-	3
8	40	38	17	1	-	4
9	65	16	13	-	-	9

I = Knowledge
II = Comprehension
III = Application
IV = Analysis
V = Synthesis
VI = Evaluation

*Based on Bloom, et al. taxonomy.

Average:

I	II	III	IV	V	VI
43%	33%	15%	1%	1%	7%

Conclusions:

For all teachers observed, the two lower levels of the taxonomy play the main role (average: 76%).

For 7 teachers out of 9, practically no analysis or synthesis eliciting functions are observed.

The general hypothesis of low quality teaching is confirmed.

****

B I B L I O G R A P H Y

Bayer, E., Essai d'observation objective du comportement des enseignants, Université de Liège, 1964 (unpublished dissertation).

_____ "Etudes objectives des comportements d'enseignement," in Revue Belge de Psychologie et de Pédagogie, XXVIII, 115, 1966, 73-88.

_____ "Comparaison de deux méthodes d'enregistrement des comportements verbaux d'enseignants," in Scientia Paedagogica Experimentalis, IV, 1, 1967, 98-103.

_____ "Quelques hypothèses expérimentales à propos de l'enseignement Decroly," in Revue Belge de Psychologie et de Pédagogie.

De Landsheere, G., Introduction à la recherche pédagogique, Paris, A. Colin-Bourrelier, 1970, 3e éd., 163-183.

_____ "La prédiction et l'évaluation de l'efficacité des professeurs," in Revue Belge de Psychologie et de Pédagogie, XXV, 104, 1963, 93-111.

_____ "La formation des maitres par l'analyse des interactions pédagogiques," in W. Hilligen (Ed.), Padagogische Forschung, Bielefeld, Bertelsman, 1970.

De Landsheere, G., Bayer, E., Comment les maitres enseignent. Analyse des interactions verbales en classe, Bruxelles, Ministère de l'Education nationale, Administration des Etudes, 1969, 117 p.

Jacques, G., L'enseignement de la géographie en première année du secondaire. Analyse des fonctions d'enseignement, Université de Liège, 1969 (unpublished dissertation).

Martin, J.M., Essai de modification contrôlée du comportement pédagogique d'un instituteur. Etude des fonctions de feedback, Universite de Liege, 1970 (unpublished dissertation).

Ninane, A.M., Essai d'application de la taxonomie de BLOOM (domaine cognitif) à l'analyse des comportements d'enseignement, Université de Liège, 1969 (unpublished dissertation).

Van Ceulebroeck, M., Approche de "l'école moderne" (Pédagogie Freinet), Université de Liège, 1968 (unpublished dissertation).