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The Influence of a Teacher Training Program on Student Perception of Classroom Climate

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ABSTRACT *Many studies of classroom climate demonstrate effects on student learning outcomes. In this study the effect of a short in-service teacher training program on pupil perceptions of the classroom climate is investigated. Two conditions are compared: in the first condition the teachers participated in the training program at the beginning of the school year; in the second condition the teachers participated in January. It appeared from the results that pupils did not perceive a difference between teachers in the first condition and teachers in the second, with respect to the topics which were the focus of training (classroom management and instruction). However, a difference in the perception of the teacher/pupil relationships was found in favor of the teachers in the first condition.*

INTRODUCTION

This study is concerned with the psychological classroom environment; the climate or atmosphere of the class as a social group. The classroom climate influences the learning behavior in of the pupils as has been confirmed by a number of studies (e.g. O'Reilly, 1975; Cort, 1979; Kelly, 1980; Walberg *et al.*, 1977). The teacher is part of the learning environment as perceived by the pupils and as such, his or her teaching behavior affects the pupils' perception of the classroom climate.

The most widely used instruments used to assess learning environment at secondary level are the Learning Environment Inventory (LEI; Fraser *et al.*, 1982), the Classroom Environment Scale (CES; Moos & Trickett, 1974) and the Individualized Classroom Environment Questionnaire (ICEQ; Fraser, 1985). Although the conceptualization of classroom climate can take many different forms (as evidenced by the labels designating the scales of the three instruments mentioned above), the underlying structure of the instruments is the same. They all start out from the framework formulated by Moos (1979).

Moos and his associates concluded from extensive research into the functioning of

TABLE I. Structure of and scales in the three classroom climate instruments

Instrument	Items per scale	Relationship dimension	Personal development dimension	System maintenance & change dimension
Learning Environment Inventory (LEI)	7	Cohesiveness Friction Favoritism Cliquishness Satisfaction Apathy	Speed Difficulty Competitiveness	Diversity Formality Material Environment Goal direction Disorganization Democracy
Classroom Environment Scale (CES)	10	Involvement Affiliation Teacher Support	Task Orientation Competition	Order and organization Rule clarity Teacher control Innovation
Individualized Classroom Environment Questionnaire (ICEQ)	10	Personalization Participation	Independence Investigation	Differentiation

diverse environments such as hospital wards, prisons and military companies that the same three general categories can be used to conceptualize the dimensions characterizing psychosocial environments. These three dimensions are:

- (1) *the relationship dimension*: this dimension identifies the nature and intensity of personal relationships within the environment; it assesses the extent to which people are involved in the environment and the extent to which they support and help each other;
- (2) *the personal development dimension*: this dimension assesses the basic directions along with personal growth and self-enhancement tend to occur; and
- (3) *the system maintenance and system change dimension*: this dimension involves the extent to which the environment is orderly, is clear in expectations, maintains control, and is responsive to change.

These dimensions form the underlying structure of the instruments for classroom climate mentioned above.

A growing number of studies use measures of classroom climate to evaluate curricular and instructional innovations (see, e.g. Walberg, 1975; Fraser, 1986, for an overview and summary of those studies). In the Netherlands only a few of these studies have been carried out (Kuhlemeier, 1983; Veenman, 1975; Wierstra, 1984). Kuhlemeier (1983) and Wierstra (1984) evaluated the PLON (*Project Leerplan Ontwikkeling Natuurkunde*) curriculum using an adapted version of the ICEQ: it appeared that a new physics curriculum caused a more favourable perception of, for

example, participation and differentiation, but not on relationship scales to be interpreted as helpfulness and friendliness. As part of his study, Veenman (1975) investigated the influence of a teacher training program on the interaction aspects of teaching behavior (Flanders, 1970) for classroom climate as measured by the Minnesota Pupile Attitude Inventory (MPAI). He hypothesized that a more positive classroom climate could be created in the classrooms of teachers trained on the basis of interaction-analysis. Veenman could not confirm his hypothesis.

In the present study a measure of classroom climate is used to evaluate the effect of a one day in-service teacher training program. This program is based on a teaching script (described in detail in Van der Sijde, 1987). The training program centers on a new teaching script and recommendations for instruction and classroom management, which are based on the results of the Dutch Classroom Environment Study—correlational phase (Krammer, 1984; Tomic, 1985). The content of the training program is organized around three topics: (1) the format of the lesson (the script), (2) management of the classroom, and (3) instruction. The content of the training program forms a conceptual whole.

The content of the training program is described in a 40-page manual entitled *Management en instructie in wiskundelessen*. ('Management and instruction in mathematics lessons') (see Table II).

TABLE II. A summary of instruction and managerial rules

Lesson phase model:	phase 1	Review of homework	(5-10 min)
	phase 2	Presentation	(10-15 min)
	phase 3	Monitored practice	(± 5 min)
	phase 4	Guided practice	(± 10 min)
	phase 5	Homework/tutoring	(± 10 min)

Classroom management

- use a beginning-of-the lesson signal.
- Make transitions between lesson phases as smooth as possible.
- Make sure that there is a continuous stream of activities in the classroom.
- Be with-in.
- Maintain group focus.
- Let students be responsible for their work.

Instruction

- Discuss all homework assignments.
- Start presentation with a review of relevant concepts.
- Refresh prior knowledge through questioning.
- Use concrete examples during presentation.
- Indicate (un)important passages in the textbook.
- Indicate what is important (oral/blackborad).
- Give clear assignments for monitored practice.
- React positively to students.
- Check the assignments during monitored practice.
- Redirect questions and use probes.
- Give students time to work on their homework assignments at the end of the lesson.
- Tutor students who encountered problems at the end of the lesson.

The intent of the in-service teacher training program is twofold: first to change the teachers' teaching script; second, as a consequence, to change the actual teaching behavior. The underlying assumption of research such as this study, conducted according to the descriptive-correlational-experimental loop (Rosenshine & Furst, 1973) is that only visible teacher behavior has an impact on student learning. It appeared from results reported in Van der Sijde (1987) that training had no effect on the students' attitudes, but it did affect the student's achievement and the teachers' behavior. There were several important differences in the teachers' performance. For a detailed analysis of the differences in teaching behavior, refer to Van der Sijde (1987). If training also affects student perception of the classroom climate, this should become visible for those dimensions of an instrument for classroom climate related to 'instruction' and 'management'.

METHOD

Participants

Participating in this study were the classes (eighth grade Havo and Vwo) of 20 mathematics teachers (mean number of years of experience: 5.05) using the textbook *Sigma*. The mean number of students per class was 28. Twelve teachers participated in a teacher training program at the beginning of the school year (condition 1) and eight participated in the training program after the Christmas holidays (condition 2).

The Classroom Environment Scale

The Classroom Environment Scale was selected as the instrument to measure classroom climate because the scales in this instrument can, more than in the other two instruments (see Table I), be characterized as 'instruction'-related and 'management'-related. The Classroom Environment Scale (CES) is one of a number of social-psychological climate instruments developed by Moos and his associates. It is a 90-item true-false questionnaire containing nine scales divided over three dimensions:

- Relationship dimensions: involvement, affiliation and teacher support;
- Personal development dimensions: task orientation and competition;
- System maintenance dimensions: order and organization, rule clarity, teacher control and innovation.

From a principal component analysis followed by a Varimax rotation carried out on the data sampled in the present study, it appeared that six factors, each exceeding an eigenvalue of 1.00; accounted for 40.5% of the variance. Almost all factors identified by Trickett & Quinlan (1979) in their analysis ('rule emphasis'; 'order and organization'; 'friendly and easy-going teacher'; 'innovative, student-oriented teaching approach'; 'student competition'; 'student affiliation') could also be identified in the Dutch CES version (see Table III).

TABLE III. The scales of the Dutch CES with illustrative items

<i>Scale</i>	<i>Examples</i>
Order & Organisation	<ul style="list-style-type: none"> ● This class will often be in an uproar ● The teacher will often have to tell students to calm down
Friendly teacher	<ul style="list-style-type: none"> ● The teacher will be more like a friend than a figure of authority ● The teacher will often take time out from the lesson plan to talk about other things
Rule emphasis	<ul style="list-style-type: none"> ● There will be clear set of rules for students to follow ● If a student breaks a rule in this class he will be sure to get into trouble
Teacher support	<ul style="list-style-type: none"> ● Sometimes the teacher will embarrass students for not knowing the answer ● This teacher will not trust students
Student affiliation	<ul style="list-style-type: none"> ● There are groups who won't get along in class ● Some students in this class won't like each other
Innovative student-oriented teaching approach	<ul style="list-style-type: none"> ● It will be easy to get a group together for a project ● Students will sometimes present something they have worked on to the class

There are two exceptions. The first concerns the factor 'friendly and easy-going teacher' of Trickett & Quinlan, which is the factor 'friendly teacher' in the Dutch sample. The second exception concerns the factor 'student competition', which could not be identified; in the Dutch sample a factor 'teacher support' could be labelled. In this analysis all 90 items are used and each factor is considered as a Likert-scale (scale one contains 23 items; scale two, 13 items; scale three, 16 items; scale four 22 items; scale five, seven items; and scale six, nine items). Nevertheless, the results of this factor analysis support the original conception of the CES: the system maintenance dimension is represented by 'rule emphasis', and 'order and organization'; the relationship dimension by the 'friendly teacher', 'teacher support' and 'student affiliation'; and the personal development dimension is represented by 'innovative student-oriented teaching'.

PROCEDURE

There are two conditions in this experiment. The teachers in the first condition participated in the training program in September. After being trained, they were systematically observed in the period September to December. The teachers in the second condition were also systematically observed in the period September to December, but they participated in the training program in the following January. During the one day training session the manual and the recommendations were discussed with the teachers in the light of their own experiences. The training given in January incorporated the results of the systematic observation in order to give the

teachers individual feedback on their teaching behavior. In the period January to April no systematic observation took place. The CES was administered in April.

DESIGN AND DATA

The design used in this study is depicted in Table IV. To investigate the classroom climate, the mean scores on the scales of the Dutch CES are considered as class scores: the level of analysis is the classroom and not the individual student. Because training focuses on classroom management and classroom instruction, which can also be found in the CES, a score for each of these subjects was calculated. The score for classroom management is a combination of the scales 'order and organization' and 'rule emphasis', while the score for classroom instruction is a combination of the scales 'teacher support' and 'innovative, student-oriented teaching approach'. The other two scales, 'student affiliation' and 'friendly teacher', are combined to make a score for relationship. The Mann-Whitney U-test was applied to analyze the difference between the conditions.

TABLE IV. Design
of the study

X_1	0
X_2	0

(X_1 =training followed by observations; X_2 =observations followed by a training plus individual feedback; 0=administration of CES)

RESULTS

Students in the classrooms of condition one teachers and students in the classrooms of condition two teachers differ significantly in the perception of classroom climate on one scale of the Dutch CES: student affiliation. Students perceive no other differences either in classroom management or in classroom instruction. They do perceive a significant difference in the perception of relationships in general (see Table V).

DISCUSSION

There is a difference in students' perception of classroom climate on one scale of the Classroom Environment Scale. From the perceptions of the students (as depicted in Table V) it appears that they do not perceive a difference between the teachers in the two conditions with respect to 'order and organization', 'rule emphasis', 'teacher support' and 'innovative student-oriented teaching approach' (which was expected); rather, they perceive differences in relationships among themselves, and, to a somewhat lesser degree, with the teacher: the teachers in the first condition are perceived as friendlier, which could mean that they take more (real) interest in the pupils than the teachers in the second condition. The goal of

TABLE V. Mean rank of the class scores of the two groups of teachers and the significance of the difference on the six scales of the Dutch CES, and on the dimensions instruction, classroom management, and relationship

	Mean rank condition 1	Mean rank condition 2	p^*
Scale 1: Order and organization	10.10	9.89	0.93
Scale 2: Friendly teacher	8.50	11.67	0.22
Scale 3: Rule emphasis	11.50	8.33	0.22
Scale 4: Teacher support	10.20	9.78	0.87
Scale 5: Student affiliation	6.30	14.11	0.01
Scale 6: Innovative student-oriented teaching approach	9.10	11.00	0.46
Instruction	9.60	10.44	0.74
Management	10.40	9.56	0.74
Relationship	7.50	12.78	0.04

* p -value calculated with the Mann-Whitney test.

the teacher training program was to make mathematics teaching more effective, to enhance student achievement and to create a more positive attitude toward mathematics. Or, to state it differently: the goal of training was to change the teachers' teaching scripts and, through such a change their actual teaching behavior with respect to classroom management and instruction. The pupils did not perceive the classroom climate to be different with reference to instruction and classroom management; they did perceive differences concerning relationships.

A comparison between the results of this study and the results of a study on student achievement (Van der Sijde, 1987) shows that the most effective training condition is when training is tailored individually: when the training program gives teachers individual feedback on the observed teaching behavior. This study indicates that the classes of the teachers in condition one perceived themselves as having better relationships with their pupils.

At this point the question arises whether perceptions can be changed and how difficult this is. How persistent can a once-formed perception be? The pupil perception of classroom climate is based on many observations; when a certain perception of classroom climate has been formed, how penetrative must training be to change an established perception? Two answers are possible. First, the perception of classroom climate is formed during the first months of the school year. Once a perception has been formed, it is difficult to change it. The students in the classrooms of the teachers in condition one formed their perception of the classroom climate after the teachers had taken part in the training, whereas the students of the teachers in condition two started to form their perception of the classroom climate before their teachers had participated in the training.

Second, it takes quite some time to form a perception of the classroom climate. The teachers in condition one were able to behave according to the teaching script presented to them in training for almost a whole school year so producing consistent

behavior throughout the year. The teachers in the second condition, however, behaved differently during the two halves of the school year. The average perception of teachers in one condition differs from that of teachers in the other for the whole school year.

It appears from this study that the teachers in condition one were able to build up better relationships with and among their students than the teachers in condition two. It is of importance that a particular classroom procedure (the consistent execution of a certain script) is carried out over a long period of time to affect classroom climate.

CONCLUSION

In conclusion, a few remarks can be made. A questionnaire on classroom climate such as the Classroom Environment Scale gives information supplementary to more 'classic' product measures. Student perceptions of classroom climate are high inference measures based on their experiences as participants in a particular setting, whereas systematic classroom observations by trained observers (low inference measures) are observations based on predetermined categories of behavior. Students perceived better relationships among themselves and with their teacher; no differences were found with respect to their perception of instruction and classroom management.

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