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ABSTRACT

This paper examines four studies, integrated into regular courses for the preparation of secondary school teachers at the University of Tuebingen (Germany), that assessed the effectiveness of an interaction laboratory to enhance social competence, as well as lecturing skills. The program involved formal instruction; symbolic modeling and discrimination training; simulation, planning exercises, and development of alternatives; practice in experimental settings with feedback; and reflective discussions. The studies examined whether the program, designed to integrate four functions of laboratory experience (skill acquisition, hypothesis generation and decision making, skillful execution of behavior, and reflection), would significantly improve participants' presentations in the areas of clarity, interest of presentation, and social climate. Participants included 125 university students studying to become secondary school teachers in various subject areas, as well as an additional 141 business executives and university professors. The first three studies used a pretest-posttest design and the fourth used a posttest-only design. Participants presented brief lectures that were videotaped and analyzed for clarity and interest of presentation and social climate during presentation. They also completed end-of-program questionnaires. Results suggest that laboratory experience can integrate all four functions. Trainees not only learned the skills, but also learned to apply them appropriately and effectively. Twelve figures and data tables summarize results. (Contains 146 references.) (SM)

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Interacting as Experimenting.
The Integration of Interaction Laboratory Functions for Lecture Improvement
- Four Studies -

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Interacting as Experimenting.

The Integration of Interaction Laboratory Functions for Lecture Improvement

Introduction

The educational emphasis at German universities is on subject matter competence and its scientific methods. The improvement of social competence, which is of tremendous importance for successful study, as well as a requirement for many professions (e.g., teachers, managers) is largely neglected. In order to tackle this deficiency an interaction laboratory was established at the Center for New Learning Methods (University of Tuebingen, FRG) to enhance social competence. Among the many programs developed, tested and evaluated for this interaction laboratory and offered to student teachers, business executives (managers in industry), and university professors, one is on the improvement of lecturing.

The Training Program

Based on the empirical-analytical research on lecturing and the human studies literature, a training program was developed for preservice secondary school teachers, university teachers, and business executives which was evaluated in a number of studies and revised according to the results of these studies (Klinzing & Koch, 1987).

The Content of the Training Program

A lecture is a relatively long uninterrupted unit of discourse where one person talks to many trying to convey knowledge, generate understanding or/and arouse interest in a topic or theme (see e,g., Brown, 1985; Klinzing, Klinzing-Eurich, & Floden, 1989). This mode of instruction, which can be traced to the Greeks has been both criticized and acclaimed (Gage & Berliner, 1984; Klinzing, et al., 1989; McLeish, 1976).

Advocates of the lecture method have emphasized that lectures can

- stimulate interest in a topic because the presentation represents the living personality of the researcher and can communicate enthusiasm (e.g., Hennig, 1844; Jaspers, 1961; Paulsen, 1902; Schleiermacher, 1808; Wenke, 1967);

- give an audience the opportunity to participate in the actual thinking process of a lecturer; lectures can therefore be not only more vivid but also very actual in presenting new findings or perspectives not published yet (e.g., Paulsen, 1902);

- relate theoretical content or a field of knowledge to the actual needs, interests, prior knowledge and abilities of a particular audience (e.g., Paulsen, 1902), - regardless of its size (Gage & Berliner, 1984);

- be appropriate in introducing, orienting, or surveying a field of knowledge (e.g., Comenius, 1656; Humboldt, 1810; Husén, 1963; Jaspers, 1961; Knowles, 1964; Paulsen, 1902; Schleiermacher, 1808; Wenke, 1967, see McLeish, 1976);

- flexibly be adopted to a particular subject matter curriculum and outward circumstances like, time limit, size of the audience, available rooms, and equipment. It was argued that especially these administrative factors despite shortcomings (see below), its cheapness, adaptability and flexibility made that the lecture method persisted (and will persist) over the centuries (e.g., Gage & Berliner, 1984; Hale, ed., 1964; McLeish, 1976).

Since the invention of printing and since books and journals are numerous as a source of information, lecturing as a source of teaching has lead to considerable controversy. The critique (often comparing lecturing with other --"modern"-- teaching methods, e.g., Hennig, 1844, assumed to be more engaging for students) emphasizes, for example, that lectures are anachronistic and unnecessary (e.g., Fichte, 1817), because books as a source of information are more effective to work with and are easily available. Moreover, lectures were often seen as detrimental because

- they condemn the audience to passivity (limiting it to merely note taking) (e.g., Bernheim, 1898; Knowles & Husen, 1963) and can therefore *not* be effective;

- lectures keep the audience away from reading and studying actively sources of knowledge (e.g., Bernheim, 1898);

- prevent the audience from critical thinking (e.g., Bernheim, 1898; Zielinski, 1967); and

- even indoctrinate an audience (e.g., Horkheimer, 1952).

Thus, lecturing was seen as a method not effective and appropriate as a source of information, even for university teaching. This critique became particularly polemic in the 1968 student revolt when university professors' authority was strongly questioned and (with it) their most common mode of teaching at that time: the lecturing method (e.g., Eckstein, 1978; Sader, Clemens-Lodde, Keil-Specht, & Weingarten, 1970). At its best, lecturing was seen as appropriate for very limited kinds of objectives.

Empirical evidence over the past 70 years that tests its effectiveness in comparison to other teaching methods (predominantly in university teaching: reading, laboratory teaching, especially discussion) shows that the polemic depreciation of lecturing could not be supported by research. Over the years, reviews of a large number of studies (e.g., Bligh, 1972; Costin, 1972; Dubin & Taveggia, 1968; Kulik & Kulik, 1979; McKeachie, 1963; 1967; McKeachie & Kulik, 1975; McLeish, 1976; Thompson, 1967; Wallen & Travers, 1963) came to similar conclusions. Generally, the findings of numerous studies indicate that lecturing is an effective instructional method to present information and effects attitudes and opinions (McLeish, 1976; Thompson, 1967), especially if the lectures are not too long: 15 to 30 minutes (McLeish, 1976). Lecturing is at least as effective as other teaching methods when evaluated by student performance on final

examinations (usually objective tests). Comparisons of lecturing to other forms of teaching, with different types of criteria, however, have shown that lectures are probably more effective in acquiring information, while other methods (especially the discussion method) are more effective when retention of information, higher level thinking, and (partly) attitudes and motivation are emphasized (Kulik & Kulik, 1979; McKeachie & Kulik, 1975). No consistent differences were found for student satisfaction (especially Costin, 1972).

Although lecturing is not the method of choice for all communication/teaching goals and situations, it can be an appropriate way of meeting certain instructional goals because of its relative effectiveness and favorable administrative factors (e.g., its economy, adaptability, and flexibility), when judiciously used in combination with other forms of communication or teaching,. It is a component of many other forms of communication/teaching (e.g., discussion, debate, direct instruction model, see, e.g., Rosenshine & Stevens, 1986). Thus, it belongs to those methods which teachers and other professionals need to be able to use effectively and creatively, when appropriate. It is therefore, important for teachers and personnel of other professions requiring intensive human interaction to be able to decide when a lecture is appropriate, and then to be able to lecture informatively, clearly, and interestingly by providing a productive social climate while lecturing.

The findings and conclusions concerning the relative effectiveness of lectures and other forms of teaching/communication depend heavily on the quality of instruction. *Essential features* of lecturing (as well as of other teaching modes) are clarity of presentation, interest of presentation, and social climate (e.g., Brown, 1985). They should be the target of improvement. Thus the contents of the training program were compiled from a careful review of the relevant empirical analytical research and human studies literature on these essential features/dimensions of lecturing:

- *clarity of presentation* (research reviewed by, e.g., Brophy & Good, 1986; Dunkin, 1986; Groeben, 1978; Hines, Cruickshank, & Kennedy, 1985; Langer, Schulz von Thun, & Tausch, 1974; Rosenshine, 1971a; 1971b; Rosenshine & Furst, 1973; Tausch & Tausch, 1978);

- *interest of presentation* (research reviewed, e.g., Groeben, 1978; Hidi, 1990; Krapp, 1993; Schiefele, 1990; Thompson, 1967; for the relationship of interest of presentation and nonverbal expressiveness see Klinzing, 1984; Rosenshine, 1970); and

- *social climate*: influence/control and proximity/affiliation (research reviewed by, e.g., Frazer, 1986; 1998; Frazer & Walberg, 1991; Tausch & Tausch, 1978; Wiemann & Giles, 1988; Wubbels & Brekelmans, 1998).

To support an effective acquisition, these global features/dimensions then, were described in terms of their *low inference constituents*, skills and the skill clusters involved in, or facilitating them, following the analytical approach/technical skills approach (Allen & Ryan, 1969; Gage, 1963; 1972). About 75 of such technical skills were offered in the program, from which the trainees could select, and combine them into an integrated pattern to be clearer, more interesting, and to have a more supportive social climate while lecturing (see below lists of skills offered in the program and research base). Trainees were also encouraged to develop and validate their own technical skills following the technical skills approach.

Structure and Components of the Training Program

To achieve these ambitious objectives a program was designed using a *Teaching/Interaction Laboratory Approach.* Training methods in a laboratory setting were developed as on-campus activities as an addition to the traditional mainstays of the education for professions requiring intensive human interaction, like the teaching profession: lecture and coursework, and the traditional methods of introduction into practice (like on-the-job training, apprenticeship). They aim at providing a set of experiences "to bridge the gap between principles and practices" (Copeland, 1982, 1008). Originally they were designed to improve general competence and/or technical skill of personnel after their academic studies and before they take responsibility for teaching and other tasks (e.g., Allen & Ryan, 1969). So they were intended improve the transition from academic study to practice. Later they were also used widely in connection with academic courses (e.g., general methods courses or courses in educational psychology) as a means to enlighten theory (e.g., Davis & Smoot, 1969), and also in inservice programs (Klinzing, 1998).

The concept of laboratory training for teacher education –and the education for other professions- has been derived from different sources and has taken different forms. Many programs involving training laboratories have their roots in group dynamics, as developed at the National Training Laboratories (USA) in the late 1940s (e.g., Bradford, Gibb, & Benne, 1964). Other educational techniques developed for teaching/interaction laboratory experiences are also widely used and evaluated: These are model demonstrations, protocol materials, discrimination training, cases, critical incidents, simulation, and reflective teaching laboratories (for a review see Copeland, 1982; Cruickshank & Metcalf, 1990; Klinzing & Floden, 1990; Klinzing & Tisher, 1993). Most influential and most widely used in teacher education and the education for other professions were the developments at Stanford University (e.g., Allen & Ryan, 1969), at the Far West Laboratory for Educational Research and Development (Borg, Kelley, Langer, & Gall, 1970), and for Europe at the University of Tuebingen (Germany) (e.g., Zifreund, 1966; 1968; 1970). The kinds of teaching/interaction laboratories became well known as "*microteaching*" (Allen & Ryan, 1969), "*minicourses*" (Borg et al., 1970), "*teaching laboratories*" (Davies & Smoot, 1969), or *Training des Lehrverhaltens in Kleingruppen-Seminaren* (Training of technical skills in small group settings, Zifreund, 1966).

Different functions have been attributed to these laboratory experiences. (Because of limited space and for clarity of exposition, we separate these functions sharply, more so than the original authors would have done). They serve for:

- *Skill acquisition:* development of conceptual structures for the analysis and guidance of action (attributed often as a main function to model demonstrations, protocol materials, discrimination training, for a review, see, e.g., Cruickshank & Metcalf, 1990; Klinzing & Tisher, 1993);
- *Hypothesis generation and decision making* for action in the ongoing situation based on the best available knowledge from research and/or reflected experience. (This function is attributed to approaches like simulation, cases, critical incidents, and the development of possible alternatives to plans and procedures developed and/or delivered, see, e.g., Cruickshank & Metcalf,, 1990; Klinzing, 1982; Zifreund, 1966);
- *Execution of behavior skillfully* (This function is often attributed to approaches like microteaching and related approaches, especially to its practice component with intensive and informative feedback, e.g., Allen & Ryan, 1969; Klinzing, 1982; Zifreund, 1966);

- *Reflection* on the execution of behaviors and their consequences as well as the ability to learn from such experience (This function often is attributed to reflective teaching laboratories, especially to reflective group discussions, see Cruickshank & Metcalf, 1990; Klinzing & Tisher, 1993; Villar, 1995; Zifreund, 1966).

All of these functions, or processes are well established in the literature. Each process can make an important contribution to the education of teachers and of other professions, within the area to which it is addressed. Previous discussions of these processes consider the contributions each makes to important aspects of communication and teaching. But the literature has not included discussions and efforts of how these potentially complementary contributions might be integrated. Such an integrated approach may strengthen the effectiveness and value of training programs.

.....To integrate these processes into a program to improve lecturing the framework of "*teaching/interacting as experimentation*" was used, well described by Strasser (1967, 180):

"In making a diagnosis, the teacher generates a hypothesis about the relationship between his potential behaviour and its effect upon students. In effect he is saying, 'I..., then the learner will...'. Following the formulation of such a hypothesis, the teacher experiments: he behaves and observes the responses largely as a consequence of his behavior. These observations are then interpreted in terms of the purposes that motivated his behaviour in the first place. Viewed this way, instruction is experimental in nature."

.....Not only has teaching/communication often been conceptualized as experimentation (Coladarci, 1959; Shavelson, 1976), but experimentation has also been used as a framework for training teachers (Bishop, 1970; Klinzing, 1982; Semmel & Englert, 1978; Zifreund, 1966).

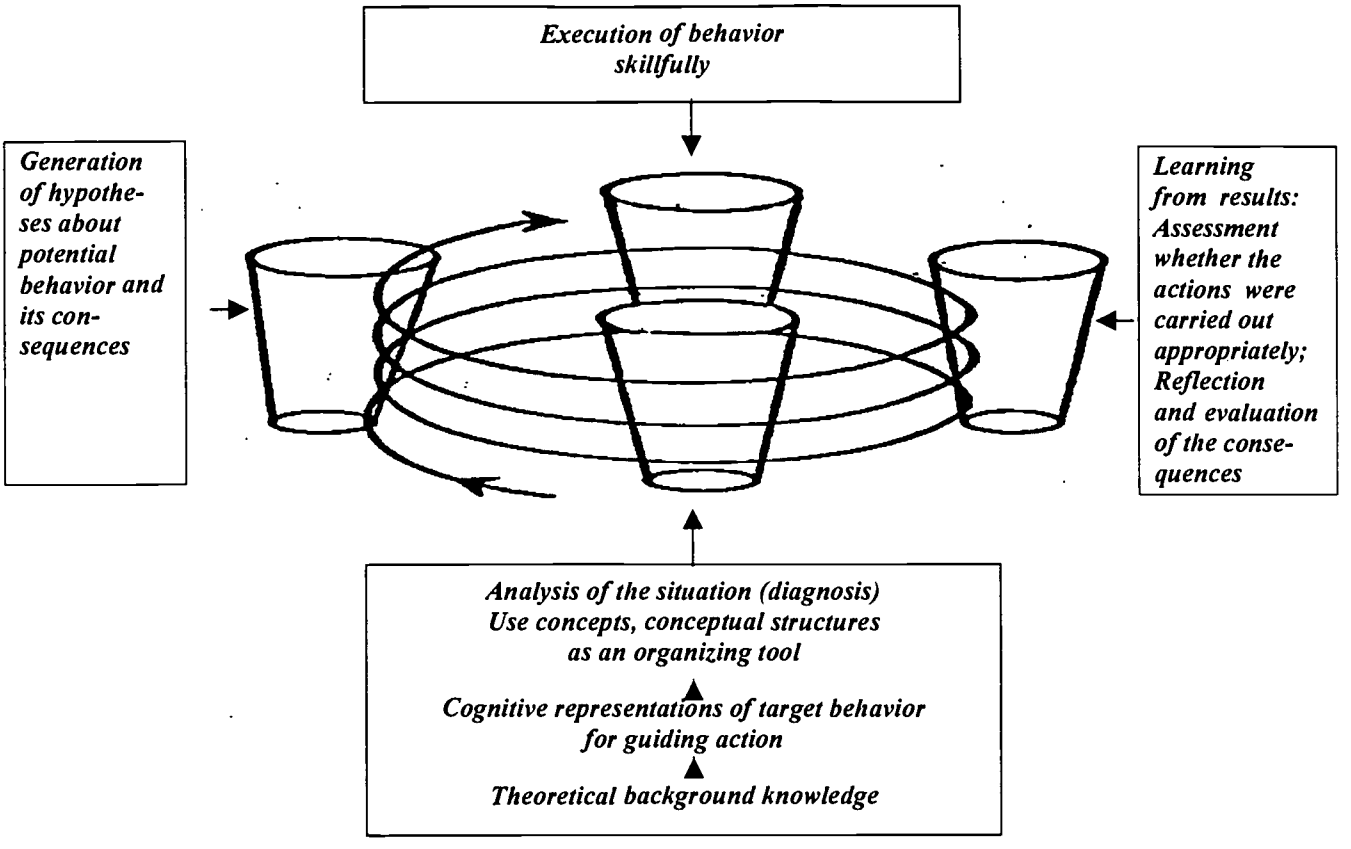
"The perspective of teaching as experimentation assumes that improvement of practice and understanding of the nature, function, and worth of practices will occur simultaneously as a mutual inspiring, interactive process. In other words, this paper reflects the belief that improvement of theoretical understanding, practical knowledge, and performance happens as an interaction between, on the one hand, extensive acquisition of knowledge, skills, and techniques and, on the other hand, focused, reflected experience. (Klinzing & Floden, 1990).

So, this frame of reference was used to identify the –interrelated processes and the abilities contributing to effective communication, so as to lecturing. *Figure 1* shows the knowledge and abilities suggested from the perspective of teaching/interaction as experimentation.

After the identification of processes contributing to effective communication/teaching, the literature and research on effective training approaches that have been developed and studied to help to acquire these abilities was carefully reviewed (Klinzing, Klinzing-Eurich, & Floden, 1989; Klinzing & Floden, 1990; Klinzing & Tisher, 1993), the different approaches to laboratory experiences analyzed for there main functions and effectiveness regarding these main functions and matched to the abilities suggested by the framework of "interacting as experimentation. *Figure 2* summarizes the educational techniques appropriate for laboratory experiences to improve knowledge and abilities suggested by teaching/interacting as experimentation.

The first two abilities and the last are primarily cognitive; the third combines cognitive processes with action. The capacity for generating hypotheses bridges thought and action. Hypotheses come primarily from knowledge and analysis of the situation, and can then be brought and tested in action.

Figure 1: ***Interacting as Experimenting as a Framework for Identification of Knowledge and Abilities for Successful Interaction***



From the techniques listed in *Figure 2* those effective approaches were selected, which fit to the prevailing conditions (time, rooms, sets of equipment and personnel available, number of participant etc.), and the content of the training (lecturing with its features clarity, interest, social climate). These, then, were integrated into a comprehensive training program (two to three days, nine to 10 hours a days, see below). It was expected that the simultaneous enhancement of the – interrelated and overlapping-- processes assumed by developers and researchers as crucial to effective communication and teaching (and therefore worth to improve in teaching/interaction laboratories individually) and integrated by the framework of interacting as experimentation, will have large constructive effects and can help to prepare skillful and reflective practitioners –an objective endorsed by prominent educators from Dewey (1904) to Berliner (1985).

.....By providing background knowledge to participants and the opportunity to skill acquisition and hypothesis generation/decision making, having them experiment in controlled laboratory settings, giving them informative feedback, and also having them use intensive, reflective discussions about this feedback as the basis for their next lecturing decisions, this approach fosters not only teacher proficiency in lecturing skills, but also helps them learn how to make and

Figure 2: ***Educational Techniques to Improve Abilities for Effective Communication***

Abilities to be improved for effective interaction	*Effective training approaches for the improvement of these abilities*
- Theoretical background knowledge and the ability to use conceptual structures to analyze interactions *and* guide action	e.g., *Model of Generative Learning* (e.g., Wittrock,1986); *Direct Instruction Model* (e.g., Rosenshine & Stevens, 1986); *Modeling, protocol materials, discrimination training/ identification exercises* (e.g., Cruickshank & Metcalf, 1990; Klinzing & Tisher, 1993; Klinzing & Floden, 1990);
- the ability to generate hypotheses for action for the ongoing situation based on the best available knowledge from research and/or reflected experience	e.g., *critical incidents* (e.g., Tripp, 1993; Tausch & Tausch, 1978); *case studies* (e.g., Bishop & Whitfield, 1972; Gliessman, Grillo & Archer, 19989; *simulation* (e.g., Cruickshank & Metcalf, 1990); *development of possible alternatives to plans and procedures developed or delivered in experimental settings, like microtraining, with intensive feedback* (e.g., Klinzing, 1982; Klinzing et al., 1989; Klinzing & Floden, 1990; Zifreund, 1966);
- The ability to carry out the behaviors skillfully the actions by that hypotheses	e.g., practice, *on the job, role play, simulations, in experimental/laboratory settings* (e.g., micro-training: 10 – 15-minute, in small groups: Allen & Ryan, 1969; Klinzing, 1982; Zifreund, 1966); with intensive and informative *feedback* (e.g., video, focused by observation instruments other persons etc., see e.g., Fuller & Manning, 1973; *coaching,* see e.g., Joyce & Showers, 1981);
- The ability to reflect on the execution of behaviors and their consequences as well as the ability to learn from such experimentation	e.g., *Reflective Teaching Laboratory* (e.g., Cruickshank & Metcalf, 1990); *reflective group discussions* (during e.g., feedback sessions: e.g., Zifreund, 1966; Klinzing, 1982; Klinzing & Tisher, 1993; 1995).

carry out reflection-based, appropriate, and effective decisions. Therefore this paper goes beyond previous research by shifting attention from programs designed to serve only one function to a program designed to serve at least equally well three more functions. Since, from a cognitive perspective, these four functions of interaction/teaching are complementary and overlapping (Bandura, 1986), it seems logical to integrate them into the design of a program. Moreover, neglecting one function (e.g., having background knowledge and/or the reflection-based decision

making ability without technical skills, or having the technical skills accomplished without knowledge and the ability to reflect and to make decisions on the effective and appropriate use of technical skills in a given situation) seems to hinder the development of the interacting/teaching ability.

Previous research on the effectiveness of teaching laboratories has concentrated on interactive communication/teaching; it remains unclear whether teaching laboratory experience is also crucial for other teaching modes. Thus this paper, secondly, extends research beyond the improvement of interactive teaching to include the mode of lecturing and explaining.

Assessment of the Effectiveness of the Program and Its Evaluation

Four studies, integrated into regular, two credit-hour courses for the preparation of secondary school teachers assessed the effectiveness of the program and its evaluation by the participants. They were conducted at the University of Tuebingen (FRG) before the beginning or after the end of the term in four days (including the efforts to test and evaluate the program), eight to 10 hours daily. They were announced as "Interacting as Experimenting" without any further information about content and objectives of the course. In addition, the program was evaluated by the participants in 16 comparable courses (20 – 25 hours, two or two and a half days) in the context of inservice training for managers in business and industry and for university teachers.

Research Questions

The questions to be addressed in the studies were:

1) *whether a training program designed to integrate the four functions of laboratory experience (described below) had a significant ($p < .01$) effect on three crucial global aspects of lecturing: clarity and interest of presentation and social climate during presentation; and*
2) *whether the participants evaluated the program positively.*

Any improvement in global aspects of lecturing would indicate that student teachers have mastered presentation skills, can generate hypotheses and can make appropriate, reflection-based decisions about when to use them, because global success in presentation requires analysis of the situation, the selecting and combining of teaching techniques in order to match a particular topic and situation.

Methods and Data Source

Subjects. 136 university students who were studying to become secondary school teachers in various subject matter areas, signed up to participate in the courses. They selected the courses (out of a number of courses offered by the Department of Education of the University of Tuebingen) because the hours fulfilled credit requirements. *Table 3* gives a synopsis of the age, average number of semesters studied at the university and the majors of participants.

Six students were unable to continue the course or to participate on the test because of scheduling problems, illness; in three cases the quality of the video records was too bad in quality so that they could not used for observer rating.

In study IV participants were stratified by gender, then randomly assigned within stratum to the treatment condition and the control condition.

Table 1: ***Characteristics of the Participants of the Studies: Age, Average Number of Semester Studied at the University and Their Majors***

Study	N	Gender male (m)/ female (f)	Age $\bar{X}$	Number of Semesters $\bar{X}$	Majors Arts	Math./ Science	Math./Science and- Arts.	Sports and- Arts	Sports and Science
I	35*/32	18f *15*/14m	26.0	9	14	4	5	8	2
II	26*/24	15f 9m	25.2	8.7	14	6	3	0	3
III	24*/23	13f 10m	25.3	7.9	9	8	1	3	2
IV									
	TG: *24*/25	13f/12m	24.8	8.0	17	2	5	0	0**
	51*/48								
	CG: *21*/23	12f/11m	24.9	8.0	12	6	1	2	0***
Studies V – XX see *Table 6*									

*: Participants who began the course but couldn't continue it. **: For 1 participant characteristics unknown. ***: For two participants characteristics are unknown. In *italics:* Number of participants which filled out the questionnaires. TG: Treatment group. CG: Control group.

The program was conducted also in companies, institutions for the training of business executives and for university professors. 141 subjects in total participated in these courses Information about the participants see *Table 6.*

Design of the Studies. The effects of the training program was investigated using a pre-experimental design (pretest-posttest design) in the first three studies (study I – III). Study IV was to replicate the findings of study I – III in a true experimental design (a posttest-only-control-group-design, with random assignment to the treatment conditions). The designs can be described as follows:

Study I – III: O_1 X O_2

Study IV: R X O_2

R - O_2

where: O_1: represents pretests used to control for initial levels of performance on the dependent variables;

O_2: represents the posttests for determining the effects of the treatment;

X: represents a 25-hour training program on lecturing;

R: represents the random assignment of participants to the treatment conditions (stratified by gender).

Treatment. The program was designed to provide opportunity for acquiring, and learning to understand

1. *background knowledge* on the lecture method, possibilities to combine this method with other teaching methods as well as on methods to improve knowledge and abilities related to successful communication/interaction; furthermore, *teaching techniques/conceptual structures* (assumed or proven by research to be effective and appropriate) which contribute to the improvement of important features (clarity and interest of presentation, supportive social climate) for analysis and guiding action;
2. to *generate hypotheses and to make decision* based on knowledge and the analysis of the situation;
3. *to carry out the behaviors skillfully*; and
4. *to reflect* on the use of these teaching techniques based on knowledge and the analysis of the situation and to learn for future interaction.

These goals were to be achieved by the combination of the following –strongly interrelated— training components, founded by research and selected for promoting the abilities identified by the general framework "*Interacting as Experimenting*":

Formal instructions:
- with focus on the background of the program-design the and the training methods used as well as on their use for improvement of abilities at the time after the formal training course (lectures, readings, all designed after the direct instruction model and the generative learning model, participant recapitulation, and discussion in small and large groups) (about 3.5. hours);
- with focus on lecturing, its appropriate use in combination with other teaching methods, its important features (clarity and interest of presentation, social climate), their constituents/skills to be acquired and/or to be developed and their appropriate use (lectures, readings, participant recapitulation, and discussion in small and large groups) (about 2 hours).

Symbolic modeling and discrimination training:
- reading of written materials with exercises (for clarity), lectures with life demonstrations and exercises (interest of presentation and social climate), development of skills not offered yet in the program (about 3 hours);
- identification of lecturing techniques on the video recordings of lectures presented in the microtraining sessions during the feedback (see below).

Simulation, planning exercises, and development of alternatives:
- *exercise* to structure a text in which the sentences were randomly ordered, and to implement techniques for making the structure explicit and the content intelligible for an oral presentation (about 1 hour);
- *student design and revision of plans* for lecture or parts of lectures (discussion with a partner) (about 2 hours),
- *development of alternatives* (during design and revision of lecture plans and to the behaviors executed in the microtraining sessions) (see below);

All instructions, demonstrations, and exercises were combined with discussions for the improvement of the level of processing and reflection of the information to be acquired;

Practice in experimental settings with feedback:

- *practice in a laboratory format* (two microtraining sessions, 10- 15 minute lectures in small groups of five to seven participants (about 2.5. hours), with intensive and informative feedback (and reflective discussions) (about 3.5 – 4 hours);

Reflective discussions:

- *discussions* in small groups reflecting on the execution of behaviors and their consequences in the microtraining sessions (see above).

Skill acquisition and the ability to understand and use concepts as organizing tools was promoted by working with careful developed written materials (for clarity of presentation) or by lectures accompanied with written materials and exercises for the development of skills (for interest and social climate), recapitulation, and application of specific skills in a given text and in the lecture plans. Further skill development was supported through (repeated) use of the skills with feedback (including exercises to identify the skills offered in the program during playback of the video recordings of the microtraining sessions). About 75 verbal and nonverbal lecturing techniques were covered in the written materials and in lectures, in categories of clarity and interest of presentation, and social climate. Participants were also encouraged to develop and validate their own lecturing skills modeling the technical skills approach.

Teacher reflection-based decision making was supported (on the base of prior formal instructions on background knowledge: the purposes of lectures, the contexts where lecturing fits with other teaching modes, etc., see below), through the simulation exercise (see above), through the planning exercises (practice in selecting and combining techniques in various lecture plans, discussion of those plans with a partner), and reconsideration for the application of alternative techniques and for revision of their plans, through focusing the feedback also on appropriate and effective selection and combination of the techniques (in regard to content and situation), and on possible alternatives, through requiring participants to revise and repeat their lectures in an experimental manner, through analytical discussions in the framework of feedback, and through allowing time for reflection after the two lectures.

The ability to carry out actions and reflection-based decisions in selecting and combining skills to meet the demands of the respective situations skillfully was supported through their repeated use in two practice sessions in an experimental setting (teach and reteach in a different group, duration: 10 to 15 minutes each).

Given the opportunities to acquire background knowledge, to promote the ability to use conceptual structures to analyze interactions *and* guide action, the ability to generate hypotheses for action for the ongoing situation based on the best available knowledge presented in the formal instructions and/or reflected experience, the repeated practice, the controlled experimental practice setting, the informative feedback, and the reflective discussions, the expectation was that the participants gain insights and experiences that help them to improve the skills offered in the program and, in addition, also the development of other functionally linked skills that were not central or not even part of the program.

The Program. At the beginning of the courses all participants were introduced to objectives, content, methods, and organization of the course. The training started with a formal lecture about communication, its forms (monologue and dialogic forms, e.g., Bollnow, 1966), the lecture method, its definition, its direct or instructional and indirect or nurturant effects, anti- and pro-lecture arguments (from the human studies literature, geisteswissenschaftliche literature), empirical evidence on the effectiveness of lectures (e.g., Dubin & Taveggia, 1968; McKeachie &

Kulik, 1975), its appropriate use, and contexts where lecturing fits with other teaching modes (Costin, 1972; Verner & Dickinson, 1962). Special attention was given to the three most important features of lectures – clarity and interest of presentation, and social climate—and their constituent components. These three features were explained and discussed in depth.

In study I – III a laboratory performance test, the pretest (see below), then, was conducted and evaluated by the training groups.

This introduction was followed by the training in the individual skills. It consisted of two parts, distributed over 2/2.5 days (about 20 hours, including breaks). The first part dealt with clarity of presentation, the second with interest of presentation and social climate. Both parts had a similar structure. They started with a lecture of the importance of the features or dimensions in question, and research evidence on those features/dimensions and its subdimensions. Then, the participants acquired the low inference constituents of the dimensions, skills and the skill clusters involved in, or facilitating them (clarity of presentation). The participants also were encouraged to develop their own skills on the base of the given framework and examples (interest of presentation, social climate). The first part of the program was on clarity of presentation. *Figure 3* gives an overview on the individual skills for the improvement of clarity of presentation offered in the program and examples of related research.

Figure 3: ***Skills for the Improvement of Clarity of Presentation***

Clarity and explicitness of organization	**Improving the level of processing: Relating the material to be learned to the cognitive structure of the audience; elaboration, repetition**
- Providing a logical organization of the content, by networking main ideas of the lecture (hierarchy, network, sequential organization, variations and combinations) (Bligh, 1972; Gage & Berliner, 1984; Thompson, 1960; Thompson, 1967); - Presentation of the material in clear steps which can be mastered by the audience before the next point is given; - Avoiding digressions or making them explicit (Rosenshine & Stevens,. 1986);	- Selection of content or aspects of a content, objectives, crucial points etc. which can be related to the cognitive structure and experiences of the audience (Wittrock, 1978);
Introductory techniques to make the organisation/ structure explicit and foster a clear organization: - Announcing the topic, making the points of view from which the content will be presented explicit, specification of objectives (Belgard, Rosenshine & Gage, 1971; Fortune, Gage, & Shutes, 1966; Hartley & Davies, 1976); - Prompting and restructuring of prior knowledge and/or experience relevant to the topic, alerting the audience to what is important by questions	- Advance Organizer (Ausubel, 1960; Hartley & Davies, 1976; Luiten, Ames, & Ackerson, 1980); - Demonstration of similarities and dissimilarities, clarification of possible confusions or interference; - Explaining unknown terms/ concepts e.g., by doublets. - Use of words in their common meaning (Dessoir, 1946); - Generation of meaningful ties to

Figure 3, cont.

or pretests (Hartley & Davies, 1976);

- Overview, outline, summarizing the main points of the lecture, advance organizer (Ausubel, 1968; Hartley & Davies, 1976; Luiten et al., 1980);
- Providing the organization of the lecture in handouts, in the introduction (Hartley, 1976), and/or progressively by visualization; (Gage & Berliner, 1984);

Structural support progressively, as the lecture unfolds

- Cues supporting the structure, verbal and nonverbal signals (e.g., pauses), transitional statements between lecture segments emphasizing the structure of a message, signal giving (Lau Kam Cheong, 1972; Crosson & Olson, 1969; Gage & Berliner, 1984; Thistlethwaite, deHaan, & Kamenetzky, 1955);

Structural supports within lecture segments :

- Verbal markers of importance (Maddox & Hoole, 1975; Petrie, 1963; Pinney, 1969); Listing, purposeful repetition for emphasizing main points; nonverbal structuring (emphasis, grouping of information (e.g., Knapp, 1978; Woodall &; Burgoon, 1981);
- Explaining links (Rosenshine, 1968);

Techniques to make the organisation structure explicit and foster a clear organization at the end of the lecture (closure – techniques)

- Use of postorganizers (Hartley & Davies, 1978),
- Summaries (Hartley, Goldie, & Steen, 1979),
- Questions to the main points of the lecture (Shutes, 1969);
- Solicitation of questions from the audience and integration of the answers into the structure
- Giving the opportunity for completing notes during reviewing the organization of the lecture; (Ladas, 1990).

prior knowledge by comparisons,

analogies, similes, examples; (Evans & Guyman, 1978; Armento, 1977; Wittrock, 1978);

- Rule-example-rule-technique (Rosenshine, 1968);
- Visualization for better understanding Clark & Salomon, 1986);
- Appropriateness of the tempo, expansion, and intensity of explanations and instructions (Van der Will, 1976; Rosenshine & Stevens, 1986),

Memorization:

- Planned repetition,
- Summaries at the end of lecture segments (Allen &: Ryan, 1969; Nuthall, 1987; Petrie, 1963; Pinney, 1969);
- Questions inserted into lectures (Berliner, 1968);
- Using mnemonic devices (see: Joyce & Weil, 1992; Levin, 1981; Bellezza, 1981);
- Providing opportunities for multimodal encoding and networking using metaphors, synesthesia, visualization etc.
- Providing opportunities for thinking through and for practicing a segment and/or main points of a lecture for the improvement of the level of processing and for producing meaningful ties to prior knowledge and experiences based, e.g., on worksheets, (working individually, with a partner, or in small groups);
- Providing opportunities for note taking (Hartley, 1976; Moore, 1968; Ladas, 1990; Weinstein & Mayer, 1986);
- Conclusion/summary (see above)

Clarity of speech/quality of delivery for facilitating the reception of information

Appropriateness in:

Figure 3, cont.

- the selection of words, syntax complexity, articulation, loudness, and speed according to the audience (Thompson, 1967);

- Fluency (avoidance of mazes etc., Hiller, Fisher, & Kaes, 1969; Land, 1981; Land, 1987; Smith & Land, 1981)
- Precision (avoidance of vague terms, Hiller, 1968; Land, 1987; Smith & Land, 1981).

The skill acquisition phase was followed by exercises to promote hypothesis generation and decision making. In the case of clarity of presentation they consisted of an exercise to rearrange, re-structure randomly ordered sentences of a text and making the structure explicit by using skills learned before. Furthermore, the decision ability was promoted through the planning exercises (practice in selecting and combining techniques in various lecture plans, discussion of those plans with a partner).

A microtraining session (10-minute lecture in a group of five to seven trainees) with feedback by the training group based on the video recording on the lecture, identification exercises, development of alternatives, and analytical, reflective discussions finished the first part of the training.

The second part of the training program was on interest of presentation and on providing a supportive social climate); it had a similar structure as for clarity of presentation. It started with an overview on the concept and importance of interest of presentation (see Hidi, 1990). Then, a conceptual framework for the development of presentation skills related to interest was presented. Examples were provided to help to develop skills to make the presentation more interesting. *Figure 4* shows this framework. Examples for interest of presentation presented were the selection of content areas or aspects of the content taking into account the interests of the audience, *making the material relevant and important for the audience by relating it to the individual interests and/or life themes* (e.g., Anderson, Shirey, Wilson, & Fielding, 1987; Kroeber-Riel, 1993; Schank, 1979), *providing motivational cues* (Gage & Berliner, 1984), *use of attention intensifying metaphors, synestesias, and intensive, emotional loaded words, universally interesting concept, new, surprising, and unexpected examples, comparisons, analogies, and anecdotes etc.* (see Hidi, 1990). Also *the use of vivid, expressive verbal behavior* (selection of vivid words, sentence structures, rhetorical means), *expressive nonverbal behavior* (Klinzing, 1984; Rosenshine, 1970), as well *as varying the stimuli by switching the channel of communication from oral to visual* (Gage & Berliner, 1984) was recommended and demonstrated.

Following the discussion of concepts of interest and the conceptual framework, the development and integration of skills in the lecture plans the third feature of effective lecturing, the creation of a supportive social climate was introduced. Again, a conceptual framework for the development of constituents of productive social climate, based on research, was provided. *Figure 5* shows this framework.

To improve a productive social climate the following skills –derived from research (reviewed by, e.g., Frazer, 1986; 1998; Frazer & Walberg, 1991; Tausch & Tausch, 1978; Wiemann & Giles, 1988; Wubbels & Brekelmans, 1998) were recommended as examples for the development of own skills (*Figure 6).*

The skill acquisition and development phase in the area of interest of presentation and social climate was followed the integration of skills into the lecture manuscript. (planning exercises:

practice in selecting and combining techniques in lecture plans, and discussion of those plans with a partner).

Again, a microtraining session (10-minute lecture in a different group of five to seven trainees) with direct feedback by the audience, feedback by the training group based on the video recording on the lecture, identification exercises, development of alternatives, and reflective discussions completed the second part of the training.

The training was followed by the posttest (see below). In a final session information was presented regarding the theoretical base of the program development, the methods used, and the experimental study, carried out in the course. Also, recommendations for further reading and especially for subsequent training on the job were given. Also the end-course questionnaire was filled out by the participants which also gave their opinion on the program and its elements in written and/or oral form.

Data Source. Pre- and posttests (for study I - III) or posttests (study III) respectively, consisted of a laboratory performance test. Participants were asked extemporaneously to conduct 8 – to 10-minute lectures on topics they were to select from one of their subject matter areas. The participants were given 75 minutes to prepare their presentations. Then they delivered their presentations to a group of peers. The presentations were videotaped for further analysis.

Videotapes of the presentations were given to trained observers according to a random ordering of the presentations to avoid sequence effects. Each lecture was independently rated by three observers. The observers were not informed as to the experimental conditions the subjects were in, or the experimental hypotheses.

The following aspects were in rated by three observers: clarity of presentation, interest of presentation and social climate during presentation.

Clarity of presentation. For the assessment of clarity of presentation a nine-item, seven-point bipolar adjective scale was developed (Klinzing & Borich, 1983). A factor analysis on data from previous studies indicates that the instrument is measuring clarity on a single dimension (Klinzing, Leuteritz, Schiefer, & Steiger, 1986; Schiefer, 1987). Results from previous studies also indicate treatment validity (Borich & Madden, 1977; Popham, 1975) of this instrument. For study III and IV the clarity items were extended by six additional items.

Three observers, who were carefully trained in the use of these scales, independently rated all videotapes on seven-point scales. Reliabilities are presented in *Tables 2* and *3*. Interrater reliability computed at the beginning of the observations ranged from .80 to .98 and observer consistency over the time the data were gathered from .80 to 1.00.

Interest of presentation. For the assessment of interest of presentation a ten-item, seven-point bipolar adjective scale was used (Klinzing & Borich, 1983). A factor analysis on data from previous studies show that this instrument is measuring interest of presentation on a single dimension (Klinzing et al., 1986; Schiefer, 1987). Results from previous studies also indicate treatment validity of this instrument (Klinzing et al., 1986). For study III and IV one item was changed due to the results of the factor analysis.

Three observers, who were carefully trained in the use of these scales, independently rated all videotapes on seven-point scales. Reliabilities are presented in *Tables 2* and *3*. Interrater reliability computed at the beginning of the observations ranged from .80 to .98 and observer consistency over the time the data were gathered from .83 to .97.

Social climate. For the assessment of the social climate during presentation a 14-item, seven-point bipolar adjective scale was developed. Three observers, who were carefully trained in the use of these scales, independently rated all videotapes on seven-point scales. Reliabilities are

Figure 4: *Interest of Presentation*

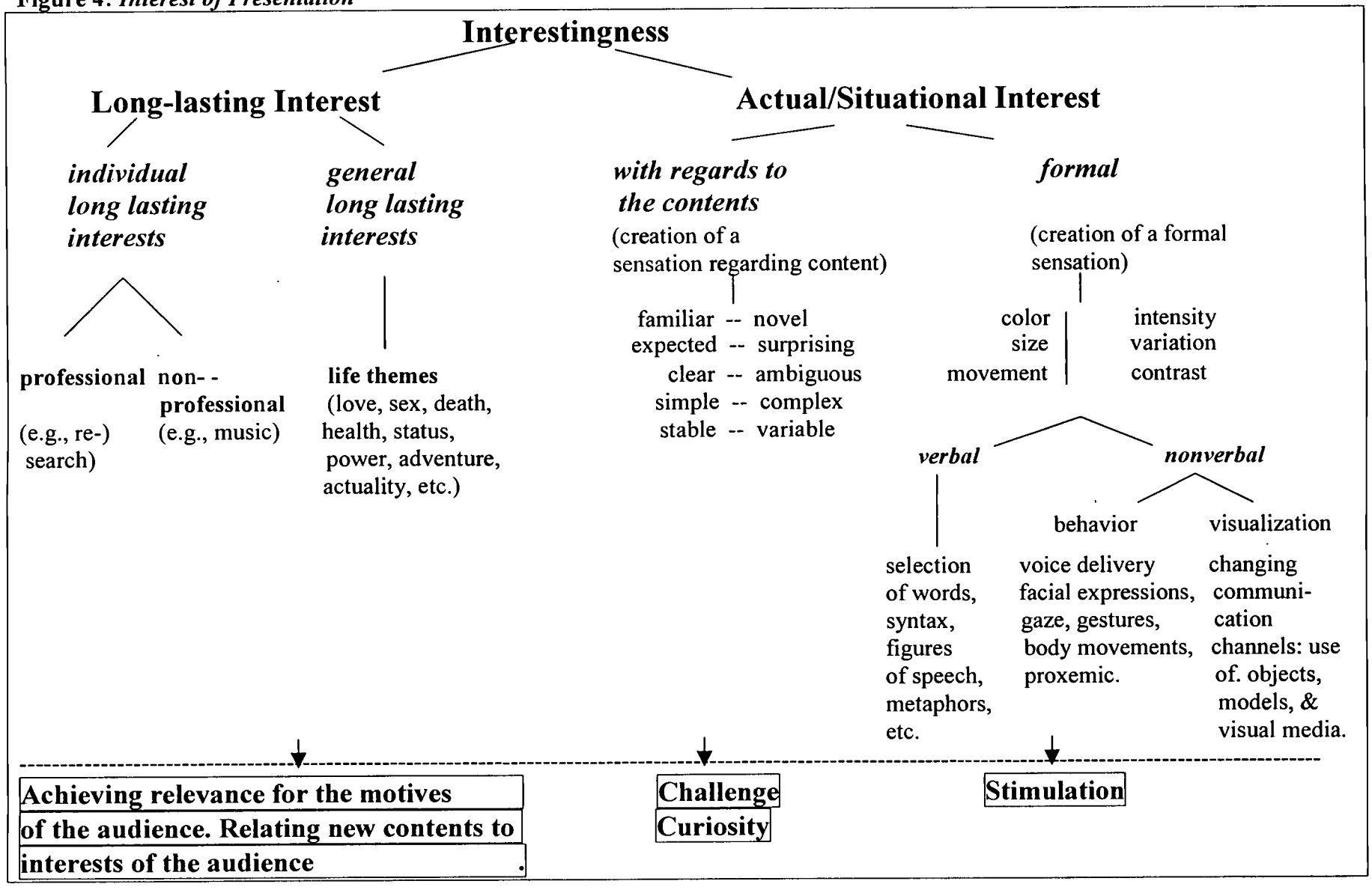


Figure 5: *Social Climate*

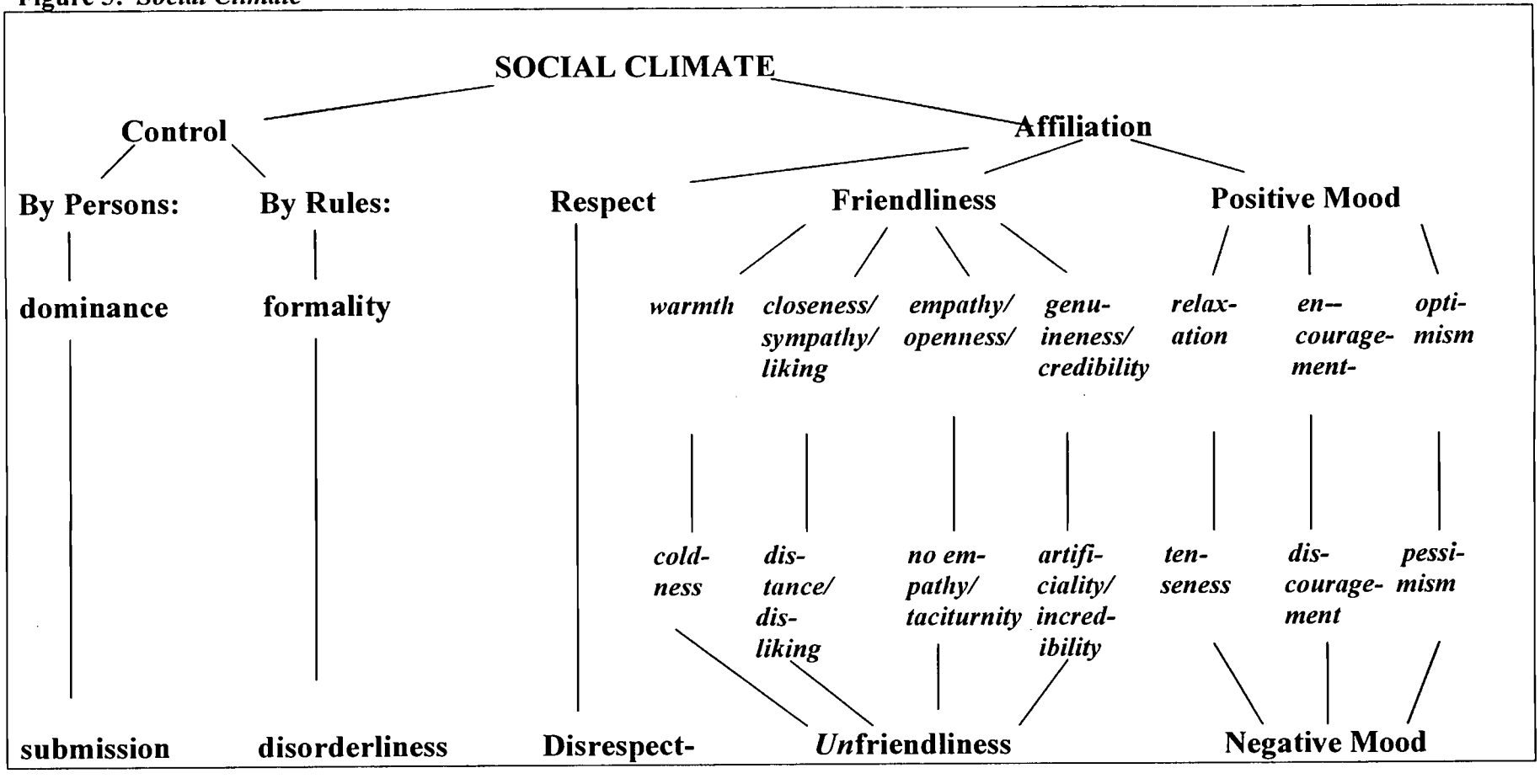


Figure 6: ***Examples of Skills to Create a Productive Social Climate***

Control

Control by persons

Limiting, defusing, making the anyway high dominance during lecturing tolerable, and compensating it by use of affiliating behavior

- *Abandonment* of autocratic, contentious, and competitive behavior and using social integrative behavior (e.g., abandonment of threats, irreversible, hostile, raging, irritable, angry, nervous expressions) (e.g., Tausch & Tausch, 1978; Wubbels & Brekelmans, 1998);

- *Abandonment* of a dominant stile in speech (over- articulation, over-accurate formulation etc. (e.g., Wiemann & Giles, 1988);

- *Defusing* the anyway existent dominance during lecturing by using a proposing, inviting, asking and informal stile in formulations and speech delivery, e.g., instead of criticism the formulation of alternatives (e.g., Tausch & Tausch, 1978; Wubbels & Brekelmans, 1998);

- Use of group management techniques (with-it-ness, smoothness, momentum, group alerting techniques (e.g., Borg, 1977; Brophy & Good, 1986; Doyle, 1986; Kounin, 1970);

- Allowance of participation (e.g., short phases of work alone, with a partner, or in small groups (e.g., Slavin, 1983; Tausch & Tausch, 1978);

- *Compensation* of dominance, making the anyway dominance during lecturing tolerable by using by using expressions of affiliation (e.g., expressions of respect, friendliness, politeness, and warmth, Wubbels & Brekelmans, 1998);

Control by rules

Limiting the control by rules and formalisms, using moderate reactions to irregularities, creations of disturbances, disruptions, and compensation by using affiliating behaviors

- Strict observance of communication rules and political correctness by the lecturer (e.g., Argyle, Furnham, & Graham, 1981)

- Moderating restrictions by rules for the audience (formalism) (Groeben, 1978; Tausch & Tausch, 1978);

- Creation of situation specific rules (e.g., rules for asking questions by the audience during lecturing, e.g., Argyle et al., 1981);

- Appropriate reactions to intentional and non-intentional disturbances and disruptions (Argyle et al., 1981);

Figure 6, cont.

- Compensation of interventions by using affiliating behaviors (e.g., expressions of respect, friendliness, politeness, and warmth, e.g., Tausch & Tausch, 1978);

Affiliation

Respect, Positive Regard

Enhancing Respect and positive regard

-
- *Omission* of humiliations, offences, cynical, contemptible, degrading remarks, judgements and expressions of impatience and lack of self control; avoidance of degrading nonobservance (e.g., lack of eye-contact, e.g., Argyle, 1978; 1972; Aspy, 1972; Mehrabian, 1972; Wubbels & Brekelmans, 1998);

- *Use of expressions of respect* (e.g., at the greeting at the beginning or end of the lecture, by using verbal and nonverbal behavior for paying attention to the audience: in voice delivery, gaze, body orientation, body lean etc., e.g., Tausch & Tausch, 1978);

Friendliness

Enhancing friendliness

Warmth

- *Omission* of nagging, merely routinely, mechanistically attendance (Tausch & Tausch, 1978);

- *Use of* "personal" politeness, expression of positive emotions; showing warmth and sympathy in nonverbal behaviors: in facial expressions (e.g., smiling), in openness of arms and legs, forward lean, body orientation and lean, in gesturing directed to the audience, in close proximity etc.(e.g., Argyle, 1978; Mehrabian, 1972; Tausch & Tausch, 1978);

- *Showing* empathy and considerateness, openess, genuineness and credibility (vs. artificiality) verbally and nonverbally (e.g., Tausch & Tausch, 1978);

Positive Mood

Enhancing positive mood

- *Showing* relaxation, creating a relaxed atmosphere (e.g., Argyle et al., 1981; Baron, 1984; 1990; Isen & Levin, 1972; Pruitt & Carnevale, 1993; Wubbels & Brekelmans, 1998);

- *Using* humor (e.g., Gage & Berliner, 1984; Kaplan & Pascoe, 1977; Klinzing, 1998);

Encouragement/Optimism

- *Use* of praise (e.g., Gage, 1978; Tausch & Tausch, 1978);

Figure 6, cont.

- *Formulation* of critique in a acceptable way, e.g., in form of positive alternatives (e.g., Zifreund, 1966);

- *Showing* positive expectations (Rosenthal & Jacobson, 1968; Tausch & Tausch, 1998).

presented in *Tables 2* and *3*. Interrater reliability computed at the beginning of the observations ranged from .83 to .98 and observer consistency over the time the data were gathered from .88 to 1.00.

Evaluation of the training program by participants. For the evaluation of the course by the participants an end-course questionnaire was used for the four studies and also –in additional 16 studies by managers in business and industry and university professors the Course/Instructor Evaluation Questionnaire was used. This instrument developed and redeveloped by Aleamoni and coworkers (Aleamoni & Stevens, 1986) consists of five subscales composed of 21 individual items (four point scales). The subscales are:

- General course attitude (four items)
- Method of instruction (four items)
- Course content (four items)
- Interest and attention (four items)
- Instructor (five items)

Information regarding reliabilities and aspects of validity are given by Aleamoni & Stephens (1986). Studies on the German version of this instrument confirm the findings of Aleamoni and coworkers.

This instrument was used at the end of the courses I, II, III, IV and in 16 additional studies. This instrument was administered again by mail two months (study III) or three months later (study IV).

In two courses (II, IV) the participants were also asked at the end of the course to sketch their opinion about the program, its content and components.

Results

Results from the Performance Tests. Wilcoxon tests (studies I – III) and t-tests (study IV) were performed on all variables. The results of this analysis are summarized in *Tables 4* and *5*.

As the results in *Table 4* and *5* indicate, there are a statistical and practical significant gains from pre- to posttests in all of the three variables in study I – III. The results of the study in a true experimental design (study IV) confirmed those of the studies in a pre-experimental design: The experimental group outperformed the control group significantly ($p < .0001$).

Results from the Course/Instructor Evaluation Questionnaire and Participant Comments. In *Table 6* the results are summarized. The results as summarized in *Table 6* show a very positive evaluation of the program by the trainees. This result is still observable after two/three months after the end of the training Study II and III). In 16 additional courses managers in business and industry on medium and high level and university teachers received a similar program and

Table 2: *Observer Agreement for Clarity and Interest of presentation and Social Climate. (Spearman rho)*

Study	Variables								
	Clarity of Presentation			**Interest of Presentation**			**Social Climate**		
I/II	A - B rho	A - C rho	B - C rho	A - B rho	A - C rho	B - C rho	A - B rho	A - C rho	B - C rho
	0.95 (N=5)	0.93 (N=5)	0.85 (N=5)	0.83 (N=5)	0.90 (N=5)	0.92 (N=5)	--- ---	--- ---	--- ---
III	0.89 (N=6)	0.80 (N=6)	0.98 (N=6)	0.93 (N=6)	0.94 (N=6)	0.90 (N=6)	0.98 (N=6)	0.94 (N=6)	0.98 (N=6)
IV	0.85 (N=5)	0.80 (N=5)	0.90 (N=5)	0.90 (N=5)	0.97 (N=5)	0.83 (N=5)	0.98 (N=5)	0.83 (N=5)	0.93 (N=5)

Table 3: *Observer Consistency (Spearman rho).*

Study	Variable								
	Clarity of Presentation			**Interest of Presentation**			**Social Climate**		
I/II	A - A rho	B - B rho	C - C rho	A - A rho	B - B rho	C - C rho	A - A rho	B - B rho	C - C rho
	0.96 (N=5)	0.86 (N=5)	0.80 (N=5)	0.76 (N=5)	0.91 (N=5)	0.96 (N=5)	---	---	---
III	0.86 (N=6)	1.00 (N=6)	0.94 (N=6)	0.93 (N=6)	0.87 (N=6)	0.99 (N=6)	0.98 (N=6)	0.98 (N=6)	1.00 (N=6)
IV	0.95 (N=5)	0.93 (N=5)	0.80 (N=5)	0.83 (N=5)	0.75 (N=5)	0.83 (N=5)	0.88 (N=5)	0.95 (N=5)	0.95 (N=5)

Table 4: ***Results for Clarity and Interest of Presentation. Means, Standard Deviations, Wicoxon- or t-Tests, and Effect Sizes (ES) for the Pre- and Posttests or the Posttests of the Experimental and Control Group.***

Study/ Variable	Clarity of Presentation*				Interest of Presentation*			
		t-Test/ Wilcoxon-Test				t-Test/ Wilcoxon-Test		
	$\bar{X}$(s)	t/T	p	ES	$\bar{X}$(s)	t/T	p	ES
I								
Pretest (N=32)	4.09 (1.17)	T = 17.5	<0.01	0.89s	4.06 (0.78)	T = 6.5	<0.01	1.33s
Posttest (N=32)	3.05 (0.96)				3.02 (0.64)			
II								
Pretest (N=24)	3.92 (1.03)	T = 44	<0.01	0.81s	4.32 (0.81)	T = 19	<0.01	1.19s
Posttest (N=24)	3.08 (1.07)				3.36 (0.82)			
III								
Pretest (N=23)	4.14 (0.65)	T = 0	<0.01	2.00s	4.87 (0.50)	T = 0	<0.01	3.94s
Posttest (N=23)	2.84 (0.44)				2.90 (0.55)			
IV								
CG (N=23)	4.11 (0.67)	t = 8.5	<0.001	1.95s	4.84 (0.63)	t = 9.18	<0.001	2.48s
TG (N=25)	2.78 (0.36)				3.29 (0.50)			

* lower values = higher clarity or interest CG: control group; TG: treatment group; two tailed test.

Table 5: ***Results for Social Climate. Means, Standard Deviations, t-Tests or Wilcoxon-Tests and Effect Sizes (ES) for Study III and IV***

Variable/ Study	Social Climate* t – Test/ Wilcoxon Test			
	$\bar{X}$(s)	t/T	p	ES
III				
Pretest (N=23)	4.22 (0.25)			
		T = 0	<0.01	3.04s
Posttest (N=23)	3.46 (0.33)			
IV				
CG (N=23)	4.18 (0.20)			
		t = 8.60	<0.001	2.85s
TG (N=25)	3.61 (0.25)			

* lower values = better Social Climate CG: control group; TG: treatment group; two tailed test.

Table 6: ***Results from the Course/Instructor Evaluation Questionnaire (CIEQ): Means for the five Subscales of the Instrument***

Study/ Subscales	I (N=33)	II, 1 (N=25)	II, 2 (N=20)	III 1 (N=23)	III, 2 (N=22)	IV, TG (N=24)
	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$
General course attitude	1.20	1.28	1.20	1.10	1.08	1.17
Method of instruction	1.46	1.43	1.33	1.31	1.28	1.25
Interest and Attention	1.45	1.43	1.43	1.21	1.32	1.29
Course content	1.44	1.40	1.36	1.32	1.43	1.27
Instructor	1.29	1.38	1.38	1.50	1.34	1.31
Total:	1.37	1.38	1.34	1.29	1.29	1.29

Four point scale: 1= strongly agree; 4 = strongly disagree. I, II,1/III,1: Administration of the questionnaire at the end of the course; II,2/III,2: Administration of the questionnaire again three or two months after the end of the course; IV, TG (treatment group).

Table 6: ***Results from the Course/Instructor Evaluation Questionnaire (CIEQ) for the Courses with Managers and University Teachers: Means for the five Subscales of the CIEQ.***

	Business executives, middle, management employed by the, same company, *non-volunteers*				Business executives, middle, management employed by different companies, *volunteers*					Business Executives, Top management, *volunteers*			University teachers, *volunteers*			
	(N= 9) Age: $\bar{X}$=38	(N=12) Age: $\bar{X}$=40	(N= 8) Age: $\bar{X}$=41	(N= 9) Age: $\bar{X}$=39	(N=10) Age: $\bar{X}$=39	(N= 9) Age: $\bar{X}$=35	(N= 8) Age: $\bar{X}$=35	(N= 9) Age: $\bar{X}$=35	(N=10) Age: $\bar{X}$=35	(N= 7) Age: $\bar{X}$=35	(N= 8) Age: $\bar{X}$=30	(N=11) Age: $\bar{X}$=42	(N= 7) Age: $\bar{X}$=48	(N=10) Age: $\bar{X}$=47	(N= 7) Age:: $\bar{X}$=40	(N=7) Age $\bar{X}$=36
	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$
General Course Attitude	1.19	1.18	1.16	1.36	1.18	1.08	1.13	1.31	1.25	1.14	1.13	1.41	1.18	1.03	1.32	1.00
Method Instruction	1.38	1.28	1.53	1.61	1.17	1.08	1.28	1.42	1.35	1.25	1.16	1.64	1.32	1.23	1.46	1.29
Interest and Attention	1.33	1.29	1.38	1.39	1.11	1.00	1.19	1.33	1.15	1.39	1.19	1.43	1.18	1.23	1.36	1.11
Course Content	1.66	1.33	1.53	1.72	1.20	1.15	1.19	1.42	1.20	1.32	1.28	1.48	1.39	1.35	1.32	1.18
Instructor	1.17	1.23	1.23	1.29	1.13	1.09	1.10	1.29	1.08	1.29	1.15	1.31	1.03	1.24	1.29	1.17
Total:	1.35	1.26	1.37	1.47	1.16	1.08	1.18	1.35	1.21	1.28	1.18	1.45	1.22	1.22	1.35	1.13

Four point scale: 1: strongly agree; 4: strongly disagree

evaluated it with help of the CIEQ. *Table 5* show the results.

The results in *Table 6* indicate that the program was also rated very favorably by managers and university teachers, especially by managers who participated voluntarily and top-managers.

Results from written evaluations by the participants of the courses II and III confirmed those from the CIEQ.

In summary, results show consistently for the four studies that the training increased significantly ($p < .001$) the level of clarity and interest of presentation as well as for social climate (significant at the 0.001 level; overall ES = 2.17s).). The results from the C/IEQ and written evaluations show very positive evaluations of the training program by all kinds of participants.

Discussion

Using a framework of interacting/teaching, this paper organized past research and extended that research to a program combining and integrating four teaching functions which, individually, could be attributed to various kinds of teaching/interaction laboratories. It also moves beyond the usual realm of interactive teaching/ communication.

The positive results of the four studies suggest that laboratory experience can integrate all four functions. They show for three important features of lecturing (clarity and interest of presentation, social climate) that training of particular lecturing skills in a laboratory setting in the framework of "Interacting as Experimenting" can be effective for the preparation for lecturing/expository teaching. The results from pre-experimental studies were confirmed by those of the study in a true experimental design. Because global ratings (rather than counts of the frequency of specific behaviors) were used in the assessment, the results indicate that trainees not only learned the skills, but also learned to apply them appropriately and effectively, that is, they learned how to decide when a component skill was appropriate, rather than merely learning to mechanically reproduce individual behaviors. The training program encourages trainees to modify their communication through a process of experimentation – making informed guesses about how their performance might be improved, testing those guesses and reflecting upon the results. Such experimentation allows trainees to integrate various skills explicitly addressed in instruction, together with other ways of acting they developed for themselves, into a complex lecturing performance that can be adapted to the specific communication situation.

The results are consistent with, and often exceeded, the results of international research on programs on interactive communication/teaching aiming mainly at one function (e.g. Butcher, 1981; Klinzing & Tisher, 1993).

Trainees' evaluative reactions to the training course support the worth of the program for improving social competence.

The pressure for more communicative competence in many professions, as well as in the teaching profession, makes it especially important to continue to build our knowledge on how education can enhance communicative ability. Yet, while interaction laboratories, like teaching laboratories, occupy still an important place in many educational programs,

the volume of research has declined in the past two decades (e.g., Levis, 1987; McLeod, 1987).

This paper has suggested that interaction laboratories can have a wider application. Rather than writing off this approach as outdated, additional research and development should be carried out to see how our understanding of this component of education, especially teacher education, can be extended to encompass a wide range of goals for preparation in many professions.

„Many fads have come and gone in education during the past few decades; but some of them, like microteaching, probably had large constructive effects. Educational research will accumulate more knowledge and help improve education more than it has if the results of old and new programs such as microteaching are synthesized." (Walberg, 1986, 220).

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