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MASSEY UNIVERSITY

AN EVALUATION OF TRADITIONAL STAFF DEVELOPMENT PRACTICES

FOR IMPLEMENTING CHANGE IN UNIVERSITY TEACHING

by

ERIC ROBERT ASHCROFT

A THESIS
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DOCTOR OF PHILOSOPHY
IN EDUCATION

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CHAPTER 1

INTRODUCTION

In early 1978 the dean of the Faculty of Agricultural and Horticultural Sciences at Massey University instituted a review of the faculty's educational programme. This involved consultation with employers of graduates, the Faculty of Education at Massey University, and a range of individuals and groups from organizations both within New Zealand and overseas. Essentially, Faculty objectives of the exercise were;

To review and improve the curriculum and teaching of the B.Agr.Sc. and B.Agr.Sc.(Hons) programmes...to develop specific teaching-learning objectives for, and to integrate and sequence the courses which are to make up the programme for the new 3-year B.Agr. degree.

(Degree Curriculum Review and Improvement Workshop, October, 1978, PURPOSE, Appendix 2, p.1).

Bachelor degree courses in Agricultural Science and Horticultural Science had been operating at Massey for a considerable time and had undergone continuous evolutionary development as well as periodic more intensive and specific review. Major changes over the years occurred within the first and fourth years of these degrees. Changes to the first year were marked by a move away from a common intermediate course in science, (common to medicine, dentistry, veterinary science, engineering and architecture), to a science course more specifically relevant to agriculture, horticulture and veterinary science. The intention was to provide content having direct relevance to the final three years of these degrees.

Changes to the fourth year of the course were characterized by additions to the number of specialist options open to students, together with increasing specialization within what had formerly been regarded as general papers. Sub-committees of Faculty Board undertook reviews of the Bachelor of Agricultural Science, Bachelor of Horticultural Science and Honours programmes. This resulted in

development of curriculum and methodology for a new 3 year Bachelor of Agriculture degree. The opportunity was taken to start from scratch, in order to change not only the type of graduate produced but also the methods used. With such changes in orientation came problems of developing appropriate curricula, resources and instructional methods.

Stripped of specifics, the scenario together with staff development ramifications, is somewhat typical of curriculum development in the university area. Dissatisfaction with existing functions and outcomes leads to problem identification and a search for solution.

The researcher, together with other members of the Faculty of Education, was initially drawn into the situation as a consultant on curriculum development issues. From this beginning and after consultations with the deans of both faculties, two researcher roles were accepted by staff.

The first role, (as a resource person for curriculum and staff development activities), involved provision of workshops and courses covering... "educationally sound curriculum and teaching strategies for the 3-year B.Agr., degree" (Hughes, 1978, p1). Concurrent with these traditional activities was provision of consultancy services to special interest groups, identification and provision of resources relating to curriculum and staff development and meeting the requests of individuals.

The second role was that of monitoring changes resulting from problem identification and curriculum review exercises. The nature and purpose of staff involvement in the research and monitoring exercise was explained to staff and thoroughly discussed at meetings called for that purpose late in 1978. Two quotations from recent papers published by staff involved, serve to illustrate faculty attitudes to this dual approach.

This involvement of the Faculty of Education began an association with the Agricultural and Horticultural Sciences Faculty which has had a major influence on the B.Agr. degree...A series of workshops on teaching and learning were held to prepare for the teaching of first year courses. Further workshops were held for

second year teachers in 1980, and for third year teachers in 1981. For most participants this was their first exposure to learning processes and teaching strategies. The results of these workshops are very evident in the current B.Agr. programme.

(Gregg, Hughes, Roberts & Wright, 1984, p.13)

Development of course curricula has been assisted by contact with the Education Faculty who provided a framework on which curricula development should be considered. Since most teachers in the Agriculture Faculty have no formal training in teaching, the benefits of contact with the Education Faculty were considered by us to be invaluable.

(Climo & Gregg, 1984, p48)

This then was the background to the present study; a five year investigation and evaluation of the degree to which traditional staff development practices were effective in implementing change in university instruction.

A JUSTIFICATION FOR CONCERN

In this section some common criticisms concerning the roles of academic university staff are outlined. The criticisms are examined and a major problem identified, difficulties preventing simple solution of the problem are raised and sources of increasing pressure for change indicated.

Interest in the effectiveness and efficiency of university staff has extended over a lengthy period. Byrnes and Jamrich, (1962, p.1) reported that staff of the University of Paris compared the effectiveness of rapidly and slowly paced lecture deliveries. Using some undisclosed method, they determined that fast delivery was best. Predating current moves to establish sanctions against ineffective teaching by over 600 years, they set penalties for lecturers who did not conform. The year was 1355.

Criticism of all levels of university staff has ranged from the bluntly specific to the tactfully general, and has been raised internationally by administrators, faculty and students.

Australian criticism has been frequent and sharp from the early 1960's. Australian universities were accused of lagging behind their American counterparts in the use of tests of teacher performance and behind British Universities in the provision of instruction for staff in the skills of teaching and examining. They have been criticized for holding to examination procedures too far divorced from the process of learning and teaching and of frequently lacking adequate information on the efficiency of faculties and departments in the pursuit of their objectives (Williams Report, 1977).

Later, the Australian Vice Chancellors Working Party (1981) observed that the basic approach to teaching had changed little since the 1960's, and that apathy of senior staff members and heads of departments had often been detrimental to staff development initiatives. A major source of concern was the lack of institutional support of a moral as opposed to a financial kind (Australian Vice Chancellors Committee, 1981).

This was given greater specificity a year later when the Commonwealth Tertiary Education Commission (1982), observed that academic staff found it frustrating to have no clear idea of their educational role, of what they ought to be doing beyond "teaching the subject" when they appeared before classes for many hours per week. Comment was made that "destructive indifference comes from middle management, heads of departments and schools, and from deans of faculties."

The New Zealand Advisory Council on Educational Planning (1974), implied criticism in a recommendation "that all universities develop suitable programmes of training university teachers, and establish machinery to encourage cooperation and coordination of this work" (Holmes Report, 1974).

Criticisms in the United Kingdom have been constant and wide ranging from the rapid growth period of the 1960's to the present day (Robbins, 1963; Hale, 1964; Brynmor Jones, 1965; Brynmor Jones, 1972; Pitt, 1980). The Robbins Committee (1963) noted excessive complaints from both faculty and students concerning instruction. The Hale Committee (1964) noted that haphazard staff induction and training resulted in teaching that was seen to be less effective than it should be. Ineffective use of audio-visual aids in higher education was a focus of the Brynmor Jones (1965) criticism.

The outcome of the Pitt Review Group Report (1980) was the phasing out of the National Coordinating Committee for the Training of University Teachers, a pragmatic criticism of the committee's functions, relevance and effectiveness (Robbins, 1963; Mack, 1983; Matheson, 1982). University teachers were described as being insufficiently trained for their work, "because there was little to tempt anyone to give time to the study of teaching which both inclination and self interest would lead faculty to devote to their subjects." (Hale, 1964).

In a statement on staff recruitment, a later international survey provided even more biting criticism of the university profession.

..this is a profession which puts a premium on high standards, on precision in scholarship and research, and on complex procedures for admitting and examining students, yet adopts the most unsystematic criteria for recruiting newcomers to its ranks. It is generally assumed that outstanding academic performance...is necessarily correlated with the skills...required of a teacher.

(MacKenzie, Eraut and Jones, 1970, pp38-39)

Somewhat generalized criticism from the United States was summarized in an extract from the final report of the American Assembly on the Integrity of Higher Education:

Public confidence in American Higher Education has been eroded in recent years. Consensus on what constitutes legitimate higher education has been reduced, and expectations of it - and claims for it - have not been fulfilled.

(Walton and Bolman, 1979, p.vii)

Specific recommendations for major changes in the organization and operation of American universities were made by the Task Force on Academic Reform of the United States Department of Health, Education and Welfare (1971), the Carnegie Commission on Higher Education (1971), and the Assembly on University Goals and Governance (1971), cited in Wilson & Gaff (1975, p.4).

In a discussion of interactive forces and leadership in U.S.A. higher education, Martorana and Kuhns (1975) commented that universities stood accused of poor planning, of insensitivity to society's needs, of ignoring technology that could improve teaching effectiveness, of being unable to provide sound and sufficient information on its activities and of ineffective use of resources. They indicated that, according to many critics, only drastic change could remove these weaknesses. More specific criticism of the lack of training for university teaching was made by Gaff (1976), who observed that "this do nothing approach is not sufficient...professors' scholarly competence does not necessarily translate into teaching effectiveness. It is a necessary but not sufficient condition" (p.3). He later focussed criticism on specific shortcomings, claiming that "Universities are now staffed by faculty who, in general, have not studied the history of their profession, are unfamiliar with the topography of the educational landscape, are unaware of the professional literature in higher education and have never been expected to formulate systematically their own philosophies of education or their views about teaching and learning" (Gaff, 1976, p16).

Barzun, (1960) identified "the mania for research" as resulting in an invidious system of academic promotion, the perversion of the undergraduate curriculum and (most recent), the professional teacher's contempt of teaching.

In short, polity, administrators, faculty and students have criticized many aspects of university services. Resultant pressures have been directed increasingly at the most public and most vulnerable roles of faculty - those roles directly and indirectly related to teaching.

CRITICISM OF THE TEACHING ROLE.

For the majority of staff the academic role is multifaceted. The degree of involvement and effectiveness in different aspects of that role has marked variation between individuals. While criticism has been directed at many activities of universities, emphasis is increasingly toward accountability and effectiveness of university teaching.

Startup's (1979) analysis of the occupational role of the university teacher illustrated the multifaceted character of academic life. Faculty activities, in order of importance as ranked by students, yielded six generic categories giving primacy to teaching.

1. Activities concerned with the acts of person to person instruction including tutorials, laboratory supervision, lectures and seminars.

2. Preparatory, summative and administrative activities related to teaching such as lecture preparation, learning about teaching, course design, marking, writing references and counselling students.

3. Reading for, getting money for, organizing and carrying out research.

4. Postgraduate supervision.

5. Professional activities including personal study, writing, consultancy and services to the community.

6. Administrative activities at faculty, departmental and university levels.

The earlier survey by the Committee on Higher Education (Robbins, 1963) also gave priority to the category of teaching, (as perceived by academics), on the basis of time spent on six activities.

34%	Teaching related activities
28%	Research activities
11%	Private study
11%	Administrative duties
10%	Examining and related activities
6%	Work outside the university

Similar priority was echoed in a Kellogg Foundation (U.S.A.)

survey listing ten historically based aspects of teaching ranging from subject mastery, resources, organization and administration, to personal and professional development (Lindquist, 1979).

In terms of university purposes, effective and efficient performance in all role aspects is desirable. Indeed, polity, administrators, faculty and support services are all open to criticism. There is little doubt that individuals involved in such a range of activities, interests, motivations, effectiveness and involvements vary markedly from activity to activity. Given such variation staff have not only the right but also the need to specialize to varying degrees. However the words of a former president of Illinois State University, S.E. Braden, succinctly express the centrality of teaching in all these activities:

Everything a faculty member does is concerned with teaching in its broadest form and only the audience varies. In what we call 'teaching' the audience is students, usually but not always in a classroom situation; in what we call 'research' the audience is one's faculty colleagues as one communicates in writing what he has learned to his audience; and in what we call 'service' the function is still communicating knowledge though the audience is neither traditional students nor faculty colleagues but rather members of the general public.

(Rives et al. 1979)

SOURCES OF CRITICISM.

Criticism of faculty effectiveness in the teaching role can be traced to several major sources. These have included student dissatisfaction, a desire by administrators to exercise greater control over faculty, and dissatisfaction of teaching staff with their own practices.

Other sources of dissatisfaction have been the increased sophistication of technology, the knowledge explosion, decreasing mobility of staff and changing student attitudes that reflect different motivations and socio-economic status. Growth in student numbers has

increased pressure on resources. This has increased interest in curriculum and focussed attention on institutional structures that control both curriculum and resources. There has been a shift in student-staff relationships.

These sources have all caused dissatisfaction with, and criticism of the attention universities give to the teaching role.

1. Students

Student criticism has been evidenced by avoidance of and withdrawal from courses, articles and letters in student publications, anonymous lists of 'worst lecturers', public protest meetings and formal requests for staff training programmes (Eraut, Connors & Hewton, 1980; Dunstall, Barrett & Phillips, 1984). Some impact has been removed from protests by the increasingly fashionable use of student evaluations of teaching for formative evaluation purposes (Powell, 1972; Doyle, 1975; Miller, 1971; Smith, 1980). However the major causes of dissatisfaction and criticism remain.

2. Administrators

Criticism by administrators has been both general and predatory in nature containing a preponderance of suggestions indicating an implied (or often directly stated) desire for greater control of academics. The more indirect approach contained in the recommendations of the Australian Martin Committee (1964), held "that there should be more effective methods of assessing the teaching ability of applicants for appointment and promotion", while a more directly critical tone was adopted in the Williams Report (1979);

So long as tenure is not used to protect inefficiency, idleness or other activities that impede the process of teaching, learning and research, it is an important protection for academic freedom (p180).

The desire for "significant clout", was more openly expressed in a report supporting the principle of increased administrative control of academics (A.V.C.C., 1981).

Similar criticisms by administrators toward staff accountability have been well documented (A.V.C.C., 1981; Teague, 1982; Hancock, 1982; Lonsdale, 1983). However it must also be recognized that administrative influence has been a reality even when there was no direct intention on the part of administrators to influence the nature of instructional programmes (Byrnes & Jamrich, 1962).

3. Faculty

Faculty, both individually and through professional organizations, have expressed concern on a variety of issues. United States colleges and universities have led a tendency to link tenure, salaries and promotion to a formal system of evaluation of university faculty. This movement is currently gaining momentum in Australia. However there has been strong opposition from faculty to the setting up of any procedures designed to control members of staff which could interfere with the professional autonomy of a conscientious and effective majority (Imrie, 1980). Opposition has also arisen from overtechnical and narrowly focussed approaches to staff development which tended to treat problems in isolation from specific situations of members and from broader institutional contexts.

4. Lack of training

If any common, rational and well documented reason for criticism of faculty teaching behaviour could be found, it was in the almost total absence of preparation for, and induction into, the teaching role.

Official surveys and national reports have been scathing in their statements. In Australia, "most universities seem to assume that university teachers are born teachers and examiners or that it is easy for them to learn by watching and questioning those who have acquired competence." (Williams Report, 1979, p200).

An investigation into training for teaching in universities in the United Kingdom revealed that two thirds of faculty who had completed courses of training as teachers, said that it had been of advantage to

them, but only 4% of staff had received such training and only 17% had participated in instruction or guidance on the teaching of university students (Hale, 1964). Over a decade later Beard (1976) was able to comment that the majority of teachers in higher education were not offered any courses on teaching methods and that those that were available were usually too brief to be effective. At the same time it was not uncommon for universities in the United Kingdom to make no mention of teaching responsibilities in advertisements and interviews.

Both the Robbins (1963) and Hale (1964) reports while commenting on the need for some form of training in teaching, rejected any formal preservice action.

A survey of just over half the American Colleges for Teacher Education revealed that 10% provided no pre-college workshops for faculty, 68% provided one or two days and only 20% used 3 days or more (Hyde, 1960).

To summarize, criticism and concern have been not only international and long standing but have stemmed from all levels of university and public involvement. Opinions from national, administrative and faculty levels indicated wide dissatisfaction which tended to focus on academic staff, and more particularly, on their teaching roles. Solution of these concerns has been hindered by a variety of constraints relating to conceptual, practical and philosophical issues.

CONSTRAINTS AGAINST SIMPLE SOLUTIONS

What can be done to improve the present situation? Although criticism and advice abound, there is also increasing understanding of constraints that militate against any simple solutions to the problem.

a. Historically universities have rejected the idea that faculty require any training other than academic excellence in a discipline. This is enshrined in a tradition that rejects or treats with passive resistance any move toward training for teaching, administration and in

many institutions, even research. There is no authoritative group with the power to prescribe training and to apply sanctions. In the vast majority of universities it is peers who exercise the greatest influence over colleagues.

This lack of authority is aggravated by general acceptance that activities relating to teaching form part of lecturers' normal duties, a part which unfortunately intrudes on time that could be devoted to research and scholarship (Eraut, 1980). In the majority of institutions this acceptance is reinforced by a pervasive belief that training activities are not valued by those in control (Mack, 1983; Matheson, 1982; Startup, 1979).

b. A second constraint lies in the lack of convincing answers to questions concerning what should be included in any course directed at improving teaching. Endeavours to tie promotion to teaching quality, involve agreement on the criteria of good teaching. This creates a fourfold problem concerned with identification of the variables of teaching effectiveness, establishment of criteria for assessing each variable, development of instruments and methods for measuring the variables and implementation of training systems for staff from diverse backgrounds. The use of procedures variously described as 'Teaching Assistantships', 'Junior Lectureships' and 'Demonstratorships' are merely euphemisms for, 'picking it up as you go'.

c. Thirdly, financial constraints dominate current literature concerned with the establishment and maintenance of staff development centres. The need to satisfy demands for accountability imposed by outside funding agencies limits the effectiveness of many projects (Rives et al, 1979; Lindquist, 1979; Young, 1982).

d. Fourthly, internal funding creates problems. It can be cancelled, cut, or in times of stringency redirected, to areas judged to be more productive. The funding of training in pre-tertiary institutions however comes from superordinate authorities. This ensures a reasonably equitable distribution of finance and involvement of personnel no matter how inadequate that may be perceived to be by teachers. However some useful advances have been made.

Staff development centres in a wide variety of forms are attempting to overcome these constraints but, "the academic mill grinds slowly, and evidence has yet to be brought to bear that efforts by these centres have materially changed instructional practices other than in a few isolated instances" (Mack, 1983).

STAFF SUPPORT

Support from faculty does exist. Despite the constraints of tradition, status given to research, peer pressures, difficulty of criteria identification and finance, there is faculty support for a range of staff development activities.

A 1971 survey of 19 institutions in the United Kingdom, indicated that over half the respondents wanted training courses to be compulsory. A clear preference was expressed for courses of five working days (Matheson, 1982). Ninety percent of respondents saw learning the techniques of teaching as the aim of university training courses.

Wilson and Gaff (1975), reported 72% of respondents as believing there should be formal procedures for evaluating teaching effectiveness. They commented that such a large response reflected "frustration with the informal systems that have traditionally been used." In this survey 52% of respondents agreed that students were the best judges of how effectively professors teach. Even higher support is on record. Bayer's (1973) survey of 42,000 faculty recorded 69% of respondents agreeing that "Faculty promotion should be based in part on formal student evaluations of teachers."

Unfortunately, the literature on staff development is rife with comments that it is mainly capable and motivated faculty who approve, support and seek such training and development activities.

PRESSURE FOR CHANGE.

It is not only faculty, but also students and administrators who have brought pressure to bear for innovation and change.

Student manipulation of faculty is not merely a recent phenomenon. In 1824 at Aberdeen University, students elected a radical rector who, at their instigation, reproved the professors for their unpunctuality. Somewhat later, in the 1960's, student dissidence resulted in an increasingly active role by student bodies not only toward academic and administrative affairs, but also toward organization of courses and programmes, outside the universities, "reflecting students' desires to turn away from traditional patterns in order to find more relevant experiences" (Falk & Dow, 1971). Pressures from students have included a demand for student evaluations of courses. This has led to increasing voluntary participation by faculty in a range of programmes. Where such programmes have been linked with feedback to staff, faculty members have been helped to improve instructional effectiveness (Hoyt & Howard, 1977; Falk & Kwong, 1971).

Student pressure has become more directly 'teaching oriented'. Heiss's (1965) survey of 450 graduate institutions revealed minimal or no supervision of newly appointed instructors. Cohen (1973) pointed out that the suitability of junior teaching assistantship staff was increasingly questioned by students, who saw them as too intent on personal studies to be adequate instructors. The National Union of Students called for compulsory training for lecturers:

A new lecturer has a great deal to learn. He has to adjust himself either to a completely new environment or else to being on the other side of what is still very much a fence, to progress in one step from being taught to teaching itself. The arts and technique of lecturing are complex. To assume that a lecturer entering the profession will automatically have satisfactory abilities in this direction is of course nonsense.

(Eraut, Connors & Hewton, 1980, p10)

Intensifying financial pressures have led administrators to be more critical of staffing structures and policies, and also more aware

of accountability demands both from students and the general public.

Pressure for training grew in the United Kingdom from the 1940's to the 1970's. This is indicated by reports from individuals, (Truscott, 1943; Mathews, 1951); from committees and commissions, (Robbins, 1963; Hale, 1964; Brynmor Jones, 1972), from the Association of University Teachers, (1966, 1969, 1974), the National Union of Students, (1961, 1969, 1980), and University Grants Committees, (1969, 1974). Clear guidelines were drawn up by committees of the latter, relating to workloads, development programmes and training of university staff. How institutions were to meet these requirements was not spelt out and, argument as to "what constituted training of a helpful and comprehensive nature has continued unabated ever since" (Mack, 1983).

The New Zealand Association of University Teachers, in a submission to a national Conference on Educational Planning, stated they were not prepared to accept that provision for the training of university teachers was a luxury that could be treated lightly (Clift & Imrie, 1978). However professional autonomy militates against the provision of formal training for all staff, although such autonomy, (together with job security provided by tenure), may be justified by the special nature of academics' work.

An example of faculty, students and administration working together to meet such pressures constructively is provided by the University College of Los Angeles School of Dentistry programme, but such an integrated response is rare (Rose, 1977).

One result of these long-standing criticisms and pressures for change by students, faculty and administration, has been the setting up of a variety of forms of multifunctional staff development units.

MULTI-FUNCTIONAL STAFF DEVELOPMENT.

As a result of the problems identified previously, various solutions have been attempted. These include demands for staff development to be directed at a wide range of interrelated outcomes

concerning resources, techniques, curricula, personal professional growth, administration, policy and evaluation systems. Activities to meet these demands have, on the whole, been inconsequential, typically piecemeal, relatively unco-ordinated, and lacking guidance from clear and public statements of mission. "One is left with the impression that staff development in higher education is many faceted and that it is still looking for a sense of direction" (Elton & Simmonds, 1977).

One attempt to solve the problem is found in organizations such as the Exxon, Kellogg and Danforth Foundations. During the last decade these foundations have made funds available to establish a variety of centres for the improvement of tertiary teaching. Referred to variously as Faculty Development Centers, Media Centers, Learning Resource Centers, Professional Development Programs, Educational Development Centers, Instructional Improvement Programs, Centers for Teaching and Learning, they serve many functions for tertiary staff.

Three common threads may be discerned. These embody a concern for the broad professional development of faculty members, a narrower concern for the effectiveness of teaching and a concern with support systems provided by all levels of the organization (Gaff, 1976, p8). Many universities provide programmes involving elements of all three, and aspects of each will of necessity affect the others.

Surveys carried out in the 1960's revealed a wide range of attempted practical solutions, usually of a superficial and sporadic nature. These have been "related more to basic employment practices than to the holistic development of faculty members, and emphasising subject matter competence of faculty rather than development in their instructional roles" (Gaff, 1976).

Because universities are complex social systems, solutions to problems of faculty development must be comprehensive, encompassing all the roles involved and reflecting the diversity that exists between institutions as well as that existing between individuals.

Staff development is not an isolated activity - it reflects general pressures and trends. It must be set clearly within a framework of overall institutional development and recognise the

pressures and constraints operating upon the college. Staff development must be central to the activity of a college or university and not tacked on as an optional extra.

(Elton & Simmonds, 1977, p.6). (Emphasis mine).

A major danger becomes apparent in these complex staff needs. Solutions to the many problems of faculty and institutions are sought in the setting up of a multiplicity of centres each focussing on different aspects. In such solutions, activity and resources relevant to the individual's present needs may be fragmented, dissipated and rendered ineffective. An overall error of attitude remains. Faculty development is generally viewed as something done by those who know, to or for those who don't or won't.

Staff development is not something which some people (staff developers) do to others (staff); it is a co-operative exercise in which everyone plays a part - willingly or unwittingly. It is more akin to a system than a process...It must also take account of the multiplicity of roles performed by academic staff.

(Fox, 1977, p.25)

Where instructional development programmes have a narrow focus excluding the wider organizational context on the one hand, or the personal professional context of faculty on the other, chances of ongoing success will be reduced. Multifunctional systems of staff development are necessary, but the mere identification of sets of roles and the establishment of centres, units or systems to deal with each in isolation, is a quasi solution of little profit. A more internally consistent model is necessary, which includes roles, developmental stages of staff, adult learning processes and wider educational variables. The training and development needs for the role of university lecturer are quite different for the newly appointed staff member, the established lecturer and the older professional.

Guidance for analysing the problem more clearly is provided by Matheson's use of the terms "acolytes, advocates and adversaries".

These three roles, advocate, acolyte and adversary, are not mutually exclusive; nor indeed is it always possible to foresee, control or change the role adopted by particular individuals or

institutions. Thus a probationer, rather than becoming a neophyte advocate, may as a result of his experience and training, join the ranks of the adversaries.

(Matheson, in Elton & Simmonds, 1977, p.35)

Staff development activities, arising from an outsider's views and 'done to others', are defined as 'Other-directed' in this study. Programs necessary to meet the different, constantly changing and individually oriented perceptions of autonomous professionals at different career stages are defined as 'Inner-directed' in genesis. That is they may be initiated, maintained and directed by the perceptions of the individuals involved. It may not be sufficient to provide either "Inner" or "other" directed programmes. A cohesive relationship between the two may be necessary. A cohesion that 'inner direction' may provide. "A comprehensive program is capable of making a more holistic and integrated impact on faculty than a single purpose one" (Gaff, 1976).

While this study later espouses the need for an 'Inner-directed' orientation for staff development, at this stage it is sufficient note that there are many problems in any system of staff development and increasing attention is being paid to the processes involved. Whatever the change, innovative behaviour or product consciously sought by administrators or faculty, the question is, 'What is the process or processes that effectively facilitate the initiation, maintenance and directing of those changes, innovations or products?'

This then is the background of justified criticisms, low accountability for teaching practice, and inertia, within which spasmodic, serendipitous and inadequately evaluated staff development practices take place. How effective are these practices? While there is a place for experimental assessments of particular methods in isolation, this study takes as its prime concern an investigation of the effectiveness of long standing and generally prevalent staff development practice. It attempts to answer two questions.

1. How effective are current staff development practices in bringing about change in the attitudes, understanding and teaching

behaviour of a typical cross-section of tertiary staff?

2. What can and should be done to increase the effectiveness of such practices?

In this instance "current" staff development practices are defined as staff development practices similar to those in operation at Massey University, New Zealand immediately prior to and during this study. These may be described as irregular and infrequent in occurrence and generally restricted to small self-motivated groups or individuals. They included courses and consultations instigated by faculties, departments, special purpose groups or individuals and were normally actioned through requests to the Education Faculty of the university or other organizations both on and off campus. No formal provisions for staff development were available at the university level other than sabbatical leave.

In the main, courses and consultations were concerned with traditional and alternative teaching methods, testing and evaluation, curriculum construction and preparation and use of audio-visual resources including student study guides. The frequency of formal courses is indicated in Figure 8.

Little is known of the overall impact of the type of staff development activities outlined above. Subjective evaluations by participants and course directors provide little more than socially oriented statements of satisfaction concerning personal levels of enjoyment. Actual implementation of the new ideas, methods or resources is seldom addressed even in the short term. The present study not only examines the degree of implementation achieved through "current" methods, but also examines reasons for their failure or success. Existing models of the implementation process are shown to be inadequate because they fail to recognize that implementation is totally dependent on the learning of participants rather than the teaching of course directors (Ashcroft, 1982).

This study constructs an original model of implementation based on the learning process (Chapter 3). In Chapter 4 principles of that process are applied in constructing measures of attitudes, knowledge and behavior related to instruction (Ashcroft, 1983). The results of traditional staff development practices, as reflected in these measures, are presented in Chapter 5. Implications of ignoring the primacy of the learning process, for the implementation of change in tertiary level instruction, are discussed in Chapters 6 and 7.

TOWARDS A DEFINITION OF 'STAFF DEVELOPMENT'.

Examination of the various terms used in Staff Development literature is essential as it provides indications as to the characteristics of the process involved. Not only does a problem arise from the variety of definitions and phrases used to describe attempts to improve academic performance, but in the literature devoted to definitions and explanations of 'staff development', inconsistencies also abound.

In surveying 47 tertiary teaching staff Matheson (1982) noted that some respondents saw dangers in seeking to define staff development. Others doubted that it could be defined. Some saw it as being confined to training in teaching, while most distinguished between training and development, and felt that the former was implemented by universities. Although there was an emphasis on professional competence, some stressed the improvement of activities, methods and approaches while others focussed on personal improvement. In addition Matheson noted some responses in favour of 'helping rather than training'. Conflicts between career needs and institutional goals were referred to by many respondents. Negative effects of imposed courses and tacitly required attendance were also discussed with much prescribing of what could and should be done, for others.

At times the term "staff development" has become a euphemism to describe a wide variety of disparate activities ranging from 'life-planning' workshops and denouncements of lecturing, to departmental re-organizations and programmes of planned organizational

change. In some cases it is clear that faculty development has become an end in itself (Rose and Nyre, 1977).

Matheson's (1982) definition showed that attempts to define what the term 'staff development' had come to mean in practice, produced relatively useless tautologies:

those events contributing to the professional development of staff which have their origins in some facet of an institution's conscious provision for organized staff development. (pp.172)

In his final definition the term is restricted to those activities organized and co-ordinated by others, supported by an institution and organized by staff developers who deliberately seek to facilitate professional development (p.172). However, the centrality of staff in decisions concerning programmes is recognized. "Too often staff development programmes are based on the hypothetical needs of faculty, as perceived by staff developers, rather than on real needs articulated, albeit with difficulty, by staff themselves" (Matheson, 1982, p.176).

A necessity to co-ordinate the goals and needs of individuals with those of the organization is widely expressed in definitions (Gaff 1975; Matheson 1982; Greenaway & Harding 1978; Hewton 1980), with the last indicating the breadth of factors involved:

Staff development seems to embrace...career development plans, study and sabbatical leave, consultancy work in industry and commerce, institutional support for personal research, funds for attendances at conferences, re-training for new tasks or subjects - all of these with the harmony of individual and organizational interests in mind.

(Hewton, 1980, p.207)

Hewton later analysed a broad range of international definitions and concluded somewhat wryly;

Staff development is therefore: course development, curriculum development, departmental development, organizational development, and part of cultural, political and national development. Furthermore it is concerned with media services, library resources

and heating classrooms...Staff development is thus what you make it and with this range of activities to choose from there are few institutions which could not be shown to engage in considerable S-D programmes.

(Hewton, 1980, p.208)

Some staff development terminology is now being used to redefine established traditions of the wider university role, with study leave or sabbatical leave being called staff development leave (Greenaway, in Elton & Simmonds, 1977).

Eraut, Connors and Hewton (1980), take a narrower perspective. They use the term 'training' to refer to all activities involving staff which are specifically designed to improve the quality of teaching and reject the term 'staff development' because they see it as an aim rather than an activity. The connotations of 'other directedness' remain. It is also apparent in the way instructional aspects of the academic role are emphasised by Francis (1975), Gaff (1975) and Hancock (1982). The latter makes a unilateral decision with refreshing bluntness in claiming that "staff development or academic development means helping staff to teach better".

Some guidance toward a practical solution is provided by Lindquist (1979) who, while not defining the terms, points up the need for any definition to include three approaches. The approach directed at instructional development, the broader approach of faculty development, and the approach whereby the major function is to study the field of higher education and disseminate the results. (Bergquist et al., 1979). In listing 14 criteria of faculty development, Rives et al. (1979), reflect Lindquist's appreciation of a multipurpose approach and at the same time introduce a limited range of specific recommendations for action. They suggest 'faculty development programs' should be;

designed to induce faculty members to make special efforts to develop their own professional growth in terms of increasing or broadening their knowledge of their discipline and their ability to transmit this knowledge in a relevant way to all their students.

(Rives et al., 1979)

It is interesting to note that the title of the programme conducted by Rives et al., was later changed to 'Instructional Improvement Program' because too much emphasis was being placed on broad faculty development aspects. These focussed on general concerns including teaching methodologies, staffing needs, building a sense of community among faculty, and organizational development. Instructional development on the other hand, was seen to be focussed on resources for improving specific courses and curricula.

It becomes apparent that many comments and definitions of staff development only reflect the immediate needs and purposes of the authors when practical outcomes are involved. Where situation-specific relevance is not dominant, comfortable generalities, confusing contradictions, or borrowed and intermixed ideas suffice.

Consistent parameters, provided by an accepted criterion referenced definition of the staff development process seem essential, before further development of theory is possible.

SOME KEY ATTRIBUTES OF 'STAFF DEVELOPMENT'.

The literature outlined above provides useful indicators for the derivation of a functional definition of staff development. Firstly, it indicates a necessity to limit the connotations of 'staff' to university personnel involved in the multi-dimensional role of academics, generally described as teaching, research, administration, service and scholarship. Secondly, it reveals 'development' has the specific connotation of involving a number of changes in attitudes, knowledge and skills. These changes are exhibited through academics' attention to three types of goals inherent in their multi-dimensional role and may be summarized as follows:

Personal-Professional Goals.

These concern the goals of individuals within the sphere of their profession. They involve change in roles as the result of experience and maturity.

Corporate-Co-ordinating Goals.

These concern the goals of individual academics in relation to institutions. They involve change as career episodes and roles unfold throughout life.

Student-Scholarship Goals.

Concern the goals of academics related to the needs, relevancies and motivations of their students (as perceived by academics).

These three types of goals pertaining to academic staff provide the focus for a definition of staff development. The categories in various forms, under a range of names and in different combinations have been used by many authors in the field, with general agreement that both content and methods should meet the changing needs of individual academics throughout their careers (Imrie 1980; Matheson 1982; Warren-Piper 1977; Gaff 1975; Lindquist 1979). While assuming that staff development is done by the enlightened, to and for the ignorant, it is also widely advised that programmes should be deliberate, systematic, continuous and follow consistent policy (Lonsdale 1983; Hewton 1980; Matheson 1982). This would require a degree of institutional support, if not institutional direction and control.

Arising from an integration of recurring principles discussed and abstracted above, staff development can be defined as:

activities engaged in by academic staff with the intention of creating changes of attitude, knowledge and skills toward Personal-Professional, Corporate-Co-ordinating and Student-Scholarship goals, involving content and methods suited to changing career needs.

This criterion referenced definition indicates the specific form of change (attitudes, knowledge and skills), the purpose (types of goals relevant to professional staff development), the need for individually relevant content or processes and the requirement of intent at all levels.

Such a definition leaves unanswered for the present the question

of how these 'intentional changes' should be initiated, maintained and directed. However, Buhl (in Lindquist, 1979) points out that any movement toward personal professional growth, which uses a more wholistic organizational development model, and which involves and is valued by students, faculty and administrators, will benefit organizational health and the students. These principles are essential to, and embodied in, the definition offered above.

So far an attempt has been made to provide clear parameters for ameliorating criticism and problems besetting university academic staff, in particular those relating to the teaching role. Some inadequacies of Staff Development Centres in coping with these problems have been advanced and the possibility of an inner directed attitude raised. The difficulty of dealing with the complexities involved has led to a definition of staff development embodying concepts on which there is a degree of consensus.

Chapter 2

INNOVATION AND CHANGE AS A FOCUS FOR STAFF DEVELOPMENT.

In whatever context the term 'development' is used, the concept of change is the major connotation. In relation to staff development, "change" may be defined as any variation or reform in organizational structure, product and process or in attitude, knowledge and behaviour of individuals. This is reflected in a wide use of such terms as improve, retrain, develop, reform, enhance, expand, extend, renew and innovate (Gaff, 1979; Cohen et al, 1973;). Also in relation to staff development, "innovation" may be defined as relatively revolutionary (rather than evolutionary) change that creates improvement in structures, products or processes which are new in the personal experience of participants. While there can be change without innovation, staff development by definition and implication places emphasis on either or both. Cohen et al.(1973), reported a wide range of innovation and experimentation being undertaken in colleges and universities and cite facets of the teaching role discussed earlier.

One annotated bibliography cites almost 150 articles dealing with the problems of change in higher education (Watson, 1967). Staff development as a vehicle for innovation is suggested by Jalling (in Teather, 1979, p.205) in the claim "Staff training is designed to make people conform: staff development, on the other hand, aims at increasing the readiness to accept and promote innovation."

The concept of innovation is also linked to that of improvement (Teather, 1979, p.252; Foster & Roe, 1979, p.34). The Advisory Council on Educational Planning (1974) notes with approval moves by universities to develop programmes 'aimed at improving' the quality of university teaching.

From Denmark, Conrad (1979) noted that the aim of staff development courses was to acquaint participants with such theories and references as to enable them to change their situation and "all courses

whether 'behaviouristic' or 'developmental' were aimed at changing the behaviour of the individual teacher."

From Germany, Gasch (1979), commenting on the tendency to teach as one has been taught, notes, "This is the main reason why change or improvement in university teaching is so difficult to achieve." In referring to Hochschuldidaktik, (centres dealing with all aspects of curricula and methodology in university teaching), Gasch points out they have responsibility for collection, interpretation and evaluation of proposed teaching reforms, as well as initiation, support and assistance with experiments in teaching reforms (Cohen et al., 1973).

From Sweden, Jalling (1979) reports that at the conclusion of training courses, participants, on return to their departments, analysed how those departments worked and, "tried to find remedies for what they considered needed changing."

Whatever the vocabulary used, or the country of origin, it is apparent that staff development programmes, have as focal concern, the creation of change and innovation in teaching, a focus that has neither been matched by effective innovation nor replicable change. This lack of implementation is a prime concern of current staff development theory and research.

INNEFFECTIVE INNOVATION AND CHANGE.

It is a justifiable position that staff development implies the process of change with improvement as the product. However as late as 1978 reviews of literature conceded the lack of dependable evidence regarding positive impact on students or demonstrated value for faculty arising from staff development activities (A.V.C.C.Report, 1981; Hoyt and Howard, 1978; Williams Report, 1979). The concept of change, alone, is insufficient to encompass current connotations of staff development. Also included are such attributes as intent and goal directedness. Combinations of these attributes abound in the literature of educational innovation, and more particularly in sections

of that literature relating to curriculum changes, staff training and staff development (Morrish, 1976; CERI, 1969; Nicholls, 1983).

Many definitions of educational innovation containing connotations of change also encompass the accepted attributes of tertiary staff development programmes as previously defined (p.24). The broader implication of these definitions of educational innovation, is to reduce the previous restrictive emphasis on institutionally determined purposes and move toward more ontogenetic processes in staff development such as research, committee work, administrative roles and scholarship. Staff development is now seen as referring to the entire sequence of events involved in the professional development of a staff member, a view supported by Matheson (1982) and embodied in the definition abstracted from the literature and presented above (p.24).

Notwithstanding this broadening of traditional emphases, the generic concepts of improvement, intent and goal directedness still pertain. Academic staff development can then involve innovation at the individual, group or organization level. In such situations, any staff development initiatives may gain insight and guidance from the findings of studies concerning educational innovation and change, particularly those concerning "Other-directed" attempts to modify the various role behaviours of academic staff without recognition of goal conflicts involved. What light can the literature of innovation and change provide for decision making in staff development? What explanation can it provide for the general lack of effectiveness currently causing such critical concern?

STAFF DEVELOPMENT: CONFLICTING REASONS FOR FAILURE.

The literature of educational innovation advances many reasons for the lack of effective innovation and change in academic staff development. Dalin (1973), identifies conflicting values, power, practicality and psychological orientations relating to a lack of understanding of political, legal, administrative and financial constraints including the in-built reward and punishment structure. He

claims these have been created to maintain the existing system and not to serve an innovative function. Rich (1981) is more specific in pointing out lack of training, lack of support, public intervention, improper utilization and lack of agreement with prevailing philosophies as the causes of ineffectiveness. Different reasons are advanced by Rose (1977) in the claim that innovative programmes don't work because participation is not mandatory, they are not consistent with institutional goals and are focussed on processes not outcomes.

A more general reason advanced by Hoyt and Howard (1977) claims that interest in innovation and change in faculty development services is outstripping knowledge of what services can be effectively provided. A similarly generalized reason advanced by Rose and Nyre (1977), notes that "faculty development has become an end in itself, and if the current messy state continues, it is destined to... become just another fad." The complexity of the problem is highlighted by both Matheson (1978) and Rives (1979), who present even more lengthy and explicit lists of problems inimical to effective innovation, (with few commonalities), while Francis (1975) advances further lists of reasons promulgated by Hefferlin (1969) and Eraut (1975).

To summarize, there exists no dearth of willingness to lay and apportion blame for ineffective innovation and change among many variables. These various analyses, culminating in such a plethora of offerings, indicate conceptual inconsistencies which can only frustrate any attempt to find a solution. However some common categories can be abstracted.

1. Lack of Goal Clarity.

It could be reasonably expected that staff development centres would be fully familiar with the needs and goals of those they propose to serve. Seldom does this occur in the complete sense of a formal needs assessment. Indeed, examination of the procedures used to assess need, reveal a preponderance of the questionnaire approach, throwing little light on faculty interests and wants (Gaff, 1976; Lindquist, 1979; Rhodes and Hounsell, 1980).

Where goals are unstated or confused, effective behaviour is reduced. "The mark of the professional is the ability to direct behaviour consistently toward clearly defined goals" (Furedy and Furedy, 1979). The 1982 report of Young et.al. provides a prime example of piecemeal, fragmented approaches lacking in overall goal clarity, and Rives (1979) points out that although a course based approach has value, long term potential is dissipated unless there is an overall wholistic model. The need for wholistic goal policies is reiterated by Rudduck (1976), Fullan and Pomfret (1977) and Gross et.al. (1971), while a sharper focus on goal clarity is called for by Nicholls (1984).

However the problem is not simply solved through goal identification, as sub-system goals may be mutually incompatible, (Miles, 1967). The differences between the goals, historical traditions, language and conceptual models of instructional development, personal-professional development and organizational development programmes is clearly documented.

The basic professional structure of each approach functions to keep them separate from one another....create confusion among professionals and layman alike....they also occasion competitiveness, suspicion and even conflict within this burgeoning movement.

(Gaff, 1976)

It is apparent there is some support for a belief that both long and short term, attainable, integrated, clearly understood and faculty relevant goal-sets may facilitate effective staff development programmes.

2. Resistance to Change.

Innovation threatens, to some degree, the identities of those involved, their expertise, status, concepts of self and personal autonomy. Such threat can result in dysfunctional stress and resistance to change (Gross et al., 1971). This stress is such that a

lecturer "will resist the change that in any way tends to lessen his position as an authority...or put him in the vulnerable position...not only as a learner but also as a subordinate...in an alien department" Morrish (1976). Later Morrish notes that faculty typically have a cautious, sceptical and critical initial reaction based on their perceptions of being criticized, being seen as needing remediation and having negative stereotypes of teacher training programmes. Where the innovation involves 'encumbered knowledge' (Shipman, 1974), human relationships will be encumbered by increased contingencies brought about by close collaboration with colleagues (Dalin, 1973). Resistance may increase unless collaboration is profitable.

Gross et.al. (1971) are sceptical, however, of an over emphasis on resistors as a sufficient explanation for the failure of innovations as propounded in taxonomies of resistance to change by Watson, Guskin, Harvey, and Eichholz and Rogers (detailed in Morrish, 1976, and Berg and Ostergren, 1977). Dalin (1978) notes that resistance can be reduced and, "generally, individuals and groups have few problems in changing their behaviour if they can see profit in it." On the other hand Klein (1966) reasons that resistance benefits innovation by bringing about, "more adequate plans and the avoidance of previously unforeseen consequences of the projected change."

Resistance to projected change can be more easily mobilized if changes are highly visible (Berg and Ostergren, 1977). At the same time resistance can mobilize driving forces (Rogers and Shoemaker, 1971). Resistance may be present but not openly expressed where staff feel it may not be in their best interests (Nicholls, 1979), or where the criteria of success differ between levels and interest groups in an organization:

The criterion of success used may often be alien to or even antithetical to the more fundamental objectives of the education system. For example, the criteria; cheapness, organizational neatness and administrative convenience, do not necessarily yield educational benefit.

(UNESCO, 1979)

Resistance, then, may be more usefully perceived from positive perspectives of deficit reduction, (reducing threat to self concept and personal autonomy), and optimizing profit, (relevant, attainable goals and personal satisfaction).

3. Source of Innovation.

The locus of control, an innovations source and power base, whether informal or bureaucratized, is seen as having potential to negate change and implementation. This locus of control, exemplified in the principle of ownership or initiation of innovations, is succinctly expressed in Freire's (1970) "banking" versus "problem posing" model of sources of educational change. "Banking" is presented as ownership and manipulation by authority, while "problem posing" is seen as including the total context as the source of change. Holt (1973), sums up opposition to the banking approach in his statement;

People seem to be trying to find alternative ways of...getting large numbers of people to learn what other people have decided will be good for them.

(In Rich, 1974, p.6)

- however, resistance created by managerial sources can never be entirely negated;

The two horns of the dilemma are represented by the view that any manipulation of human behaviour inherently violates a fundamental value, but that there exists no formula for structuring an effective change situation that such manipulation is totally absent.

(Kelman, 1965)

The same dichotomy is expressed in Fullan and Pomfret's (1977) differentiation between 'user' and 'managerial' perspectives. While claiming, "there is no evidence that leads us to select one approach over the other," they subsequently indicate that each has greater relevance in particular situations. Similarly Jalling (1980), sees the resistance and conflict between users ('faculty') and managerial ('administrators') as one between academic freedom and accountability, with the administrators stressing control and conformity and faculty

stressing autonomy and personal professional goals. That authority is dysfunctional when it diminishes the play of personal judgment is stressed by Rudduck (1976), in indicating that even the indirect authority of status can build in seeds of failure by generating "a commitment to projects, persons and institutions," rather than "a commitment to the ideas they represent." The user versus managerial perspective is reiterated in the Rogers and Shoemaker (1971) dichotomy of "collective" and "authority" decision making. They observe that the latter, "are more likely to be circumvented and may eventually lead to a high rate of discontinuance of the innovation." Resistance to authority initiated innovation is reduced, where a mutuality of support exists between user and manager levels and this is dependent on perceptions of benefits.

Dalin's (1976) model discards the inadequate user-managerial dichotomy and introduces a third intervening variable; "Those who benefit", in contrast to those who make the decisions and those who have to change. Where there is little interaction or communication the result is estrangement between the groups and individuals concerned.

As faculty in departments exceed 10 in number, the informal consultation and policy making functions become less and less effective and a bureaucratic system seems inevitable. Less communication between head of department and staff and between staff members themselves results in the formation of sub groups and cliques with diverse perspectives. With diversity, formalization of decision making increases and consensus, (concerning staff development needs for change or innovation), becomes more difficult to attain:

The essential point is that staff value their freedom of action," (p.119)...and,"over 60% believed that persons of their grade (lecturers and senior lecturers), should play a greater part in policy making.

(Startup, 1979, p.120)

Such professional autonomy vis-a-vis innovation, would have its clearest expression in small groups having common perspectives.

The widespread desire for greater participation seemed to express the principle -operative at departmental level as well- that staff

wished to gain more control over the circumstances of their own existence.

(Startup, 1979, p.121)

It is evident then that the perception of benefit is not limited to extrinsics, but also includes general attributes of the working climate. "At a more general level a complex of norms regarding openness, trust and support in communication are crucial for innovations" (Fullan et al., 1973).

The practical dilemma created by the simplistic user-managerial dichotomy is reflected in the use of external consultants, who, while providing greater objectivity, credibility and expertise, at the same time create resistance by destroying self-reliance and working against the creation of campus resources (Bergquist, 1979). On the other hand there is a general consensus that where the source of innovation is faculty based and staff can identify the benefits of involvement, have commitment to identified outcomes and retain professional autonomy, then, innovation is more likely to be an effective process.

4. Lack of Follow Through.

The essence of a 'source-of-initiation' perspective is the degree of user participation at all stages. This involves time, energy and support services. A commitment to the time span essential to effective innovating is involved. If lasting or long term impact is to be achieved then there is need for programmes to be part of the mainstream of an organization's activities. Short term, one shot, hit and run, one year funded approaches tend not to interest or involve more than a small minority of faculty. Effective participation has often been negated by lack of appreciation of time needed for both planning and implementation. Nicholls (1983), and Miles (1964), ally the time factor with the constraint of available energy:

It is difficult to innovate in permanent systems because they are directing most of their available energy toward carrying out routine operations and maintaining existing relationships.

(Nicholls, 1983)

Thus the fraction of energy left over for matters of diagnosis, planning, innovations, deliberate change and growth is ordinarily very small.

(Miles, 1964)

Faculty members are seldom given release time to work on instructional or faculty development programmes and the additions to workloads makes it difficult to sustain the programmes in the longer term. Underestimating or failing to appreciate time and energy requirements is exacerbated by the lack of change agents in education and contributes to a lack of follow up and support services (Morrish, 1976). This points up;

the dangers of the innovator merely introducing the innovation to teachers who are to be involved and leaving them to implement it. Such innovators appear to regard innovation as a single act rather than as a process, and appear to be concerned with merely introducing innovation and not with the more difficult tasks of development and maintenance.

(Nicholls, 1983)

Gross et al., (1971), also criticize administrators who regard their task as being completed with the initiation of an innovation and who assign implementation phases to subordinates. Dalin (1978) in supporting this criticism, comments;

We find in many studies of educational change that the ordinary practising teacher has not been taken into account in the definition of 'the problem', in the decision making process, in the development of the strategy and/or products to be tested or even in the actual strategy for implementation including the development of the in-service courses.

Follow-up and support services for staff development require on going attention because staff find change in teaching, at least initially, less intrinsically rewarding than research. Startup (1979) reported that, "Rather more respondents selected research (41%) than teaching (25%), "...as a rewarding activity."

The extrinsic rewards of promotion and salary are overwhelmingly

perceived to be focussed on research rather than teaching (Halsey and Trow, 1971; Startup, 1979; Elton and Simmonds, 1977). However, in many situations heads of departments have some control over promotion and hence salary. If they place value on teaching effectiveness, as well as research, the extrinsic rewards are available and further support is provided for the User model of staff development. Unless innovation and change in staff development practices give due weighting to the constraints of time, energy and follow-through procedures, the evidence suggests resulting resistance will continue to militate against desired outcomes.

5. Inadequate Evaluation Procedures.

Resistance created and exacerbated by insufficient heed of time, energy depletion and follow through factors has also been ascribed to inadequate models and procedures for the evaluation of innovation and change. As Dressel (1961) noted; "Failure to engage systematically in evaluation in reaching the many decisions necessary in education means that decision by prejudice, by tradition, or by rationalization is paramount." That little has changed in over twenty years is born out by the report of Young et.al. (1982) who after listing a total of 72 projects, illustrate the superficiality of evaluative procedures by their comment, "The effect of putting instructional development resources into instructional development activities such as these has magnificent promise, yet remains to be proven." The criteria of success was stated to be, "the visibility of the instructional development activities," based on a 50% return of a survey instrument sent to 400 staff who reported their awareness of instructional development activities at the university. While such surveys have provided valuable information in the past the criteria for success of instructional development activities may be more profitable if they include measures of improved learning arising from changes in instructional techniques as well as staff awareness of those techniques.

An evaluation of the Kellogg funded Faculty and Instructional Programs at Illinois State University, also may be seen to base

evaluation on visibility of projects and subjective perception rather than more objective measures.

a result appears to be the absence of any measurable impact on the way that the participants think about teaching after they have completed their work on the project...Anecdotal information that such changes occur was not confirmed in a systematic study of that possibility...While the activities were individually tailored the programs were neither consistent with their expectations nor did they greatly influence their behaviour- yet it is clear there was a generally positive impact on the participants, and the quality of the activities was rated favourably. (Emphasis mine).

(Rives et al., 1979)

It is interesting to note that despite the above comments and their implications, the evaluation recommended that the program not only be continued but expanded. The criteria of evaluation are focussed on the visibility of staff development activity rather than changes in instructional behaviour. As Sharpham (1979) comments, evaluations based on a head count of participants and/or contacts or courses mounted, "can be a numbers game to please funding agencies," but claims some small benefit is achieved even if such accountability procedures only produce attitudes of criticism in observers.

The inadequacy of evaluative procedures continues to contribute to the ineffectiveness of innovation and change related to staff development programmes. It is not until the procedures are focussed on both the processes and products of staff development that relevant variables will be identified, quantified and applied. Lindquist (1979), provides an indication for more pragmatic guidelines in noting that, "progress has been made in defining teacher competence as reflected in pupil growth, but researchers have avoided using this criterion because of methodological difficulties in measuring pupil gain. A 1967 survey of 1000 studies revealed only 20 in which the criterion of teacher effectiveness was student growth."

Lack of "impact-evaluations" of programmes camouflages failures. Programmes may stem from clear goals, be smoothly administered, be cost

effective, provide specified services and result in high professional regard for staff and yet make little difference to instructional practices or to the quality of student education. Impact-evaluations, the cause and effect factors they highlight, and the consistency between goal formulations and outcome realities they impose are prime missing variables of many staff development programmes. The focus has been on more easily displayed, often irrelevant, successes, such as large numbers of courses conducted, rather than the generic objectives for which the programs were nominally established.

While many of the factors relating to ineffective innovation and change are subsumed by the five variables listed and discussed above, studies of innovation can also provide guidelines for future practice and further research. These guidelines and their antecedents are discussed in the chapter that follows.

CHAPTER 3

THE LEARNING PROCESS IN IMPLEMENTATION

The following observations present reasons why current models of implementing change in tertiary teaching are deemed to be inadequate. Existing models are analysed, a critical omission identified and an original model of implementation based on the learning process proposed. It is argued that learning principles, (subsumed under generic categories of Goals, Effects and Involvements), comprise the process controlling change in user systems. A case is advanced for a model of staff development in which factors with potential for influencing the learning process may be used to implement specific changes in tertiary teaching. Finally it is argued that inner directed, community referenced groups are best situated to determine appropriate content and patterns of staff development at the tertiary level.

In the late 1960's efforts were made to identify reasons for the ineffectiveness of many attempts at educational innovation. Based on attempts to identify factors creating resistance to change these approaches had only limited success (Watson, 1967; Havelock, 1971; Eicholz & Rogers, 1964). Later attempts to identify barriers to change have focussed on factors inhibiting the implementation phase of innovation (Gross et al., 1971; Dalin, 1973; Fullan & Pomfret, 1977).

Gross et al. (1971) summarize this focus in the statement "Educational programs may have been ineffective simply because they were never effectively implemented...it is important to examine and understand the circumstances and conditions facilitating and blocking implementation" (p.7). Neither of these approaches has contributed significantly toward identifying principles involved in the implementation process per se. The authors only reiterate in different form, previously identified factors of an existing but unsatisfactory

model. An example of this is the claim that failure to implement an innovation can be attributed to five conditions or influencing factors encountered by participants but disregarded by existing conceptual systems (Gross et al., 1971). Although conceding that failure to implement can result from resistance, (or five conditions influencing resistance), they identify the performance of management as the crucial influencing factor. In essence, a variable of an existing inadequate conceptual system has been used to subsume a group of situation specific influencing factors.

Present systems can, in the main, be represented by a three variable model. These variables are: (a) Influencing Factors, (which influence a system), (b) a System (which has potential for change), and (c) an Innovation (as specified by the system). An example of this, based on the study by Gross et al. (1971), is presented in Figure 1. In this study, members of a school system attempt to introduce an innovative approach to teaching. This approach was seen to be affected by three influencing factors: Resistance to Change, Barriers to Implementation and Management. The 'system' in this case was a single school involving 10 teachers.

Gross et al. explain failure to change the Cambira school system as being due to three subsuming influencing factors which include barriers to implementation. In such a conceptualization, implementation is seen as being determined by some underlying characteristic of factors influencing a system. There is no specification of the process by which these factors exert this influence.

What is the process by which 'Resistance to Change' can be negated? Through what process are 'Staff Motivations' directed toward accepting the new teaching model? What is the process by which 'Management' can create the necessary change?

In essence Gross et al. are saying 'failure of staff to implement change is due to factors influencing the change process.' They neither define the process nor specify the principles determining that process.

Figure 1.

VARIABLES OF IMPLEMENTATION
(based on Gross et al., 1971)

Influencing Factors -----	School System -----	Innovation -----
1. Resistance to Change	1. Superintendant	Catalytic Role Model.
2. Barriers to Implementation	2. School Board	
Clarity of change	3. Directors	
Capability to change		
Resources for change	4. Subject Specialists	
Organizational		
Staff motivations	5. Teachers	
3. Management		
Bureau of Ed. Change		
University personnel		
Dept. Compensatory Ed.		

A further attempt to clarify the conceptual basis by defining implementation and its potential determinants is provided by Fullan and Pomfret (1977). They note determinants of implementation may be confused with implementation itself and that "this confusion makes it difficult to conceptualize implementation and to ascertain the factors affecting it" (p.338). They recognize that the degree of implementation can be measured reasonably well but conclude "we do not know what accounts for different degrees of implementation in the first place" (p.350).

Failure to conceptualize the process of implementation, except as a list of influencing factors, remains a weakness of the Fullan & Pomfret model. However their identification of components in a "user system" (p.361-364), introduces a more specific and precisely defined set of categories for the system variable (see Figure 2). The listing of personnel is replaced with specific attributes of the system which

must change if the innovation is to succeed.

Figure 2.

A THREE VARIABLE MODEL OF IMPLEMENTATION
(With examples derived from Fullan & Pomfret, 1977)

Influencing Factors -----	User-System Components -----	Innovation -----
1. Innovation characteristics	1. Attitudes	As specified
2. Implementation strategies	2. Skills	or evaluated
3. Socio-Politic environment	3. Knowledge	
4. Unit characteristics	4. Subject matter	
	5. Organization	

As Fullan and Pomfret (1977) point out, "A practical theory of innovation must address both the question of 'what' should be changed as well as the processes of 'how' to bring about these changes. The latter involves a careful and continuous consideration of the relationships of those who will be expected to change to the process of how this is to be done" (p.393). (Emphasis mine). This statement while indicating awareness of 'process' in general does not specify that 'process' or the principles by which it operates. While it is essential to identify influencing factors and system components it is also necessary to identify the intervening 'process' that determines the influence of factors on system components. This process controls changes in the personnel involved.

A systematically constructed conceptual model has been used by Berg and Ostergren (1977). In case studies of innovation processes in higher education they define the innovation process as "the development of a change in its social setting, from the moment when preconditions

for an innovation have emerged until the innovation in question has either become institutionalized or rejected" (p.13). The innovation process is clearly expressed as a situation specific process of change. The focus is shifted from influencing factors and influenced systems toward identifying the innovation process and its principles. Berg and Ostergren reject:

certain concepts that may basically characterize the innovation per se but have also been regarded as important to explain the innovation process. Examples of such concepts are 'centrality' and 'complexity'. Relatively early we gave up the attempts to use such concepts as instruments for analysis. We found they did not usefully contribute to explaining the processes, and that they were difficult to define.

(Berg & Ostergren, 1977, p.21)

The three variable model presented in Figures 1 and 2 is no longer sufficient to represent the Berg and Ostergren variables and must be expanded. 'Influencing Factors', a 'System' and a specified 'Innovation' are categories within previous models. The crucial addition is inclusion of a process involving specified principles, by which influencing factors implement change in a system (see Fig.3).

This attempt is represented by Berg and Ostergren's category "Decisive Factors in the Process". However the process as such is still not explained or defined. As indicated earlier in relation to Gross et al. (1977), Berg and Ostergren imply that some unspecified influence or process is operating through the 'Influencing Factors' and their 'Decisive Factors'. This omission makes it difficult to differentiate between the influencing factors and the "decisive factors in the process". For instance is 'power' more usefully conceived as a factor which influences an innovating system or as a process of innovation? Is 'leadership' an influencing factor that utilizes a higher order process to create change in a system? The question still remains unanswered as to the process, (and principles of the process), by which leadership, power, ownership and gain-loss implement an innovation. Berg and Ostergren's 'descriptive categories for internal and external relations' (p.21) (listed as Influencing Factors in Figure

3), and their 'decisive factors', may all be categorized as Influencing Factors. The problem still remains; What is the generic process by which these factors implement change in 'those who will be expected to change'? (Fullan and Pomfret, 1977, p.393).

Figure 3

A FOUR VARIABLE MODEL OF IMPLEMENTATION
(With examples derived from Berg & Ostergren, 1977)

Influencing Factors	Decisive Factors in the Process	Innovating System	Innovation
-----	-----	-----	-----
1.Conflict level	1.Gain-Loss	Institutions	As specified
2.Personnel changes	2.Ownership	of Higher Education	
3.Visibility	3.Leadership		
4.External changes	4.Power		
5.Linkage			

For example, while time, hunger, larder contents, unexpected guests and absent parents are 'factors' influencing a household 'system' to produce a desired outcome, (a cooked meal), these factors do not include the cooking process which determines the desired outcome. Children may be fully aware of all influencing factors and of all components in the household system but the less their ability to apply principles controlling the cooking process the more remote will be their chances of success.

Dalin (1978) reflects the current model and identifies eight barriers to implementation but also recognizes the inadequacy by commenting that "an identification of barriers does not explain cause and effects...and it is a long way, however, from beginning to

understand the phenomena <of educational change> to the possibility of systematic planning and management of the process" (p.36).

What are the implications of this statement for the problem under discussion?

Dalin describes schools as systemic learning organizations, "a concept that attempts to take into account the complexities and nature of the educational task in an increasingly dynamic environment" (p.42). This approach may be represented by a modification to the four variable model of Figure 3, in which Berg and Ostergren's 'decisive factors' are replaced by Dalin's 'strategies of change'.

In this he has identified influencing factors, a complex system, and an innovation. Dalin then identifies strategies of change (p.89) as an important factor of innovation, but expresses doubts as to the **process** by which these factors affect the system. "We know that the decision making structure has an impact on the change process... it is less clear, however, 'how' <it> influences the system (p.78)... The way these agencies interact... usually are influential factors in change. Again we do not know enough about 'how' these agencies interact and influence the success of an innovation" (p.79).

Dalin attempts to answer the 'how' question by using the term 'critical process' defined as "activities occurring over time which would enable the system to accomplish its goals" (p.89). These activities he equates with the selection of appropriate change strategies (p.89). However the **process** by which such strategies influence system components to create change is still not specified. Dalin has drawn attention to the interdependence of influencing factors, the complexity of school organizational systems and the difficulties of matching specific innovations to both despite the use of appropriate strategies (Figure 4).

Figure 4.

A FOUR VARIABLE MODEL OF IMPLEMENTATION
(With examples derived from Dalin, 1978)

Interdependent Influencing Factors -----	Strategies of Change -----	Innovating System -----	Innovation -----
1.Educational setting	1.Coercive	Educational organizations	Varied
2.The environment	2.R D and D		
3.The innovation	3.Problem solving		
4.The change strategy			

It could be argued that 'Strategies of Change' provide the necessary process. A range of strategies is available (Watson, 1967; Miles, 1965; Guba, 1968). Morrish (1976) defines these as a "set of policies which underlie specific tactics or actions that are considered useful in order to bring about the permanent installation of a particular innovation" (p.115). Chin & Benne (1969) use the concept of 'strategies' in a discussion of people technologies, based on behavioural knowledge for dealing effectively with the human aspects of deliberate change (p.33). They suggest that "processes of introducing such changes must be based on behavioural knowledge of change and must utilize people technologies based on such knowledge" (p.34). However the conceptualization of strategies of change into Empirical-rational (based on evidence), Normative-reeducative (based on acceptable norms), and Power-coercive (imposed), as applied by Chin & Benne, (1969), is a categorization of values underlying each group of strategies, rather than of processes determined by sets of guiding principles.

A variety of specific strategies are included in what we are

calling the empirical-rational approach to effecting change. As we have already pointed out, the rationale underlying most of these is an assumption that men are guided by reason and that they will utilize some rational calculus of self-interest in determining needed changes in behaviour

(Chin & Benne, 1969, p.35).

The three strategies may well be expressed as derivations from the cognitive, humanist and behavioural schools of learning and this approach provides an answer to the dilemma expressed in the models presented above. It is upon the **process of learning** that the strategies of change depend for their outcomes. The attitude may be power-coercive and the strategy passive resistance but the **process** by which all value orientations and strategies determine outcomes is that of learning. Dalin indirectly endorses this position;

The amount of learning and 'unlearning' necessary for the individual is a critical dimension of the change effort itself. Strategies which permit individual development and learning are critical to successful implementation. The greater and more difficult the change required of the individual, the more planners must attend to providing these learning strategies even at the cost of short run inefficiencies.

(Dalin, 1977, p.86)

The learning process is activated by influencing factors that produce change in system components. Whether the value orientation is power-coercive, normative-reeducative or empirical-rational, it would appear reasonable to suggest that **the principles that control learning, and hence behaviour, determine the degree of implementation.**

Both theory and research outlined above have identified and interrelated many of the factors involved in implementing change but the process through which these factors effect implementation has not been clearly identified previously. The unsatisfactory position is summed up by Berg and Ostergren's (1977) discussion of the variables involved in implementation.

Sometimes these give the impression of being laundry lists of isolated factors; they are scattered observations rather than a coherent whole and do not fulfill the requirements of a theory, even if they contain certain truths...They may also be too closely related to one specific system or situation to have a general explanatory or prognostic value even for education systems.

(Berg & Ostergren, 1977, p.120)

Explanations for failure to implement change are predominantly couched in terms of influencing factors, inappropriate outcomes or intractable target systems. Examples, from Berg and Ostergren (1977) attribute lack of success to resistance to change (p.100), lack of planning (pp.55-60) and leadership problems (pp.69-70). These three reasons are either influencing factors or system components. Neither the principles nor the processes, by which resistance, planning and leadership determine or subvert change, have been clarified.

A constant problem is that neither influencing factors nor system components, singly or together, are sufficient to explain variations in the degree of implementation under similar circumstances. Explanatory power accrues from an identification of a **process** determining their effects each on the other. The learning process provides that explanatory power.

Clarification of the problem is also suggested by the conceptions of physics introduced in the late 19th century by such men as Faraday, Maxwell and Hertz whose ideas brought about conceptual advances in biological and social sciences based in the new 'field theory'. Deutsch (1954) in summarizing the inadequacy of Newtonian physics to explain electromagnetic phenomena states "the field had a definite reality which was not in any way the end result of distinct individual particles or sources" (p.181).

In a similar way, it is here proposed that the learning process has a separate reality which interacts with, but is not in any way merely the end result of, influencing factors or system components per se. Principles governing that process are conceptualized as

determining the interdependencies of factors and components (Fig.5).

To summarize: previous writers have identified, (a) Influencing Factors involved in change, and (b) components of the Systems involved. The terms 'process of innovation' and 'process of change' have been used as if they were clearly defined phenomena obeying a finite set of cohesive principles. However, in endeavouring to identify the attributes of the process of change one is faced with an ever increasing list of factors, variables and components involved in the change process. The generic process through which the factors operate is variously named but few writers attempt to identify the controlling principles..

Figure 5.

A FOUR VARIABLE MODEL OF IMPLEMENTATION INCORPORATING THE
LEARNING PROCESS

INTERDEPENDENT INFLUENCING FACTORS (activate)	LEARNING PROCESS (to change)	INNOVATING SYSTEM COMPONENTS (through)	IMPLEMENTED INNOVATION
-----	-----	-----	-----
Educational setting	Objective clarity	Attitudes	Inner Directed
The environment	Relevance	Skills	Staff Development
The innovation	Feedback	Knowledge	Programme
Change strategy	Reinforcement	Subject Matter	
Individual perception		Organization	

As shown in Figure 5, implementation results when influencing factors activate the learning process to bring about change in components within an innovating system. Variations in the

implementation phenomena are conceptualized here as the result of the learning process activated by a set of interdependent factors. These bring influence to bear on components within the innovating system. It is further held that the failure of influencing factors to implement change within a system can be predicted and explained in terms of principles involved in the learning process. This process can be conceptualized as a 'field' (Lewin in Deutsch, 1954) and the properties of the field as directionalized forces determining the effects of factors on system components.

THE LEARNING PROCESS

Within the model proposed by this study, (Figure 5), the significance of an influencing factor is determined by its power to effect the learning process inherent in a system. Change strategies, characteristics of adopting units, conflict or leadership are situationally specific in implementing change. (The list of Interdependant Influencing Factors in Figure 5 is illustrative rather than inclusive). Whether any factor is an 'Influencing Factor' in specific situations is determined by its potential for causing change through the learning process.

The "Learning Process" in turn may be expressed in terms of three generic categories concerning **Goals, Effects and Involvements** which subsume the principles governing learning. These principles, (some of which are listed under LEARNING PROCESS in Fig.5), are discussed in the following section.

Goals.

The relevance, clarity and overall consistency of goals contribute to the learning process.

1.Goal Relevance.

Goal relevance, the degree to which participants see objectives as

relevant to their interests and needs, has a demonstrable effect on learning (Underwood & Schulz, 1969; Suchman, 1971; Stone, 1983). Whereas it could reasonably be expected that development centres be fully aware of the needs and goals of those they serve, seldom does this occur as the result of adequate needs assessment. Indeed, examination of procedures used to assess needs, reveals a preponderance of questionnaire approaches, throwing little light on faculty interests and wants (Gaff, 1976; Lindquist, 1979; Rhodes and Hounsell, 1980).

2. Goal Clarity.

Goal clarity, (the degree to which objectives are understood by participants), has a direct effect on learning (Mager & McCann, 1961; Blaney & McKie, 1969; Melton, 1978; Spears & Calvin, 1982). Where goals are unstated or confused, effective behaviour is reduced. Furedy and Furedy (1979) concluded that professional behaviour is characterized by the ability to pursue consistent and clearly defined goals. However, a report by Young et al. (1982) still provides a prime example of piecemeal, fragmented approaches justifying the sharper focus on goal clarity called for by Nicholls (1984).

3. Goal Consistency.

Goal consistency, the need for commonality of purpose in direction and planning, is highlighted in several studies (Rives, 1979; Rudduck, 1976; Fullan & Pomfret, 1977). Rives (1979) points out that although a course based approach has value, long term potential is dissipated unless there are overall wholistic objectives. This need for wholistic goal policy is reiterated by Rudduck (1976), Fullan and Pomfret (1977) and Gross et al. (1971). However the problem is not simply solved through goal identification, as subsystem goals may be mutually incompatible (Miles, 1967). Incompatibility between goals, historical traditions, language and conceptual models of instructional development, personal-professional development and organizational development programmes is clearly documented. Gaff (1976) claimed that the basic professional structure of each approach kept them separate

from one another, confused both professionals and layman and caused competitiveness, suspicion and conflict within the staff development movement.

It is apparent that integrated, clearly understood and faculty relevant goals are a prerequisite to effective learning. Thus influencing factors must be directed toward maximizing goal clarity, consistency and relevance if learning and change are to result from staff development activities.

Effects.

Learning is determined not only through goal oriented factors but also by the effects of experience, feedback and rewards.

1.Experience

The absence or presence of past experience relevant to desired outcomes is a determinant of learning well based in Learning Set theory (Gagne, 1962; Gagne & Briggs, 1974; Gagne, 1977) and Information Processing principles (Hunt, McV., 1961; Ausubel & Fitzgerald, 1961; Anderson & Pichert, 1978). Past experience affects ability to learn from present circumstances (Peeck, Van den Bosch & Kreupeling, 1982). Staff development programmes arising from the experience of those involved seem more likely to result in learning than those based on the unfamiliar. "Many teachers find the language which has grown up around educational technology either unintelligible or irrelevant" (Hewton et al., n.d., p17). This is reflected in the belief that outsiders cannot understand the peculiar problems attached to a particular course in a particular discipline.

2.Feedback

Learning is directly affected by the quality and timing of feedback as to the appropriateness of responses and behaviour. (Burrows, 1973; Kulhavey, 1977; Block, 1971; Dyer, 1976). Feedback is provided in staff development by interaction between participants

and between participants and programme managers. When interaction ceases, feedback on progress ceases and learning is diminished.

3. Rewards

A third factor is the effect of rewards and reinforcement on the learning process. Based in the behaviourist tradition of B.F. Skinner, the effects of rewards on human behaviour are well documented (Ward, 1976; Zifferblatt, 1973; Lysakowski & Walberg, 1982). In universities, the rewards of promotion and salary are overwhelmingly perceived to be focussed on research rather than teaching (Halsey & Trow, 1971; Startup, 1979; Elton & Simmonds, 1977), and in many situations heads of department have control over promotion and hence over salaries. If value is to be placed on teaching effectiveness in order to implement changes in staff teaching behaviours, an effective reward system including factors other than salary and promotions, appears necessary.

Involvements.

A range of factors concerning degree of active participation, quality of psycho-social climate and attention given to the task can be grouped under the general heading of 'involvement'. Involvement of personnel has an effect on learning and is thus relevant in any planning of staff development programmes. It concerns the focussing of attention and activity toward desired outcomes.

1. Active Participation

Active participation in learning situations has been clearly demonstrated to contribute significantly to learning. (Kunihera & Asher, 1965; Cole & Glass, 1977; Gage, 1978). These findings lend strong support to theory based exhortations for greater involvement of academics in their own professional development programmes (Bennis, Benne & Chin, 1969, p.336; Beard, 1970, p.53; Eraut et al., 1980, p.41). Research conducted by Lawrence (1974) and McGee (1980) concluded that active participation in in-service education was

effective in changing teaching behaviour.

2. Positive Learning Climate

The concept of positive learning climate is based in the ego theory of James (1890) and Freud (1943). It is represented in Lewin's (1936) concept of 'life space', Cattell's (1950) construct of 'the self', and the phenomenological theory of Rogers (1969), and Snygg and Combs (1949) involving self concept. The psycho-social or interactional climate of the workplace has been clearly demonstrated to affect learning (Good & Brophy, 1974; Dunkin & Biddle, 1974; Hearn & Moos, 1978). A positive learning climate of itself is insufficient to maximize learning. It must be accompanied by effective instructional practices (Pascarella & Terenzini, 1980). Also involved is the concept of motivation as it in turn is affected by debilitating tension or pleasant feeling tones. The latter increases motivation. The former causes a decrease (Hunter, 1974).

3. Focussing Attention

A third aspect of involvement as it effects learning concerns focussing and maintaining attention and minimizing distraction. Attention is captured by the unusual; Sokolov's (1963) 'orienting reflex', Fabun's (1970) 'desirable future states', or Suchman's (1971) 'opensure'. It is clear that where distraction is reduced and attention task oriented, learning is enhanced (Lynn, 1966; Baron, Moore & Sanders, 1978; Zukier & Hagon, 1978). This is individualistic. Focussing of attention is dependent on characteristics of individuals relating to motivational states, attitudes and expectations. It is often diverted to off-target or displacement activity.

The principles of learning embodied in these factors, and here subsumed under the more generic categories of Goals, Effects and Involvements, are basic to the process controlling change in innovating systems. If learning is perceived as the generic process in a conceptual model of implementation, the implications for planning and

practice in educational innovation are significant. However these wider issues are not the purpose of this study. The focus here is on the more restricted role of teaching within academic staff development, where many institutions fail to apply even the most elementary principles of learning in attempts to change the instructional behaviour of faculty. For the purposes of this study "instructional behaviour" is restricted to direct interactions between staff and students normally in classroom, workshop, seminar, tutorial or fieldtrip conditions. It does not include preparatory or evaluative aspects of the wider teaching role. The detailed variables encompassed by the term "instructional behaviour" are listed as criterion referenced, "Performances" in Figure 7.

In summary, the crucial process of implementation has been described in terms of 'Learning'. 'Staff development' has been defined as 'activities engaged in by academic staff with the intention of creating changes of attitude, knowledge and skills toward personal-professional, corporate-co-ordinating and student-scholarship goals, involving content and methods suited to changing career needs,' (this script, p.24). Within the model presented in Figure 5, three variables have been discussed and placed in the specific context of this study thus far:

a. The 'Innovation': Any staff development programme consonant with the definition of staff development presented above, (e.g. "Inner Directed Staff Development Programme" listed in Fig.5).

b. The 'Innovating System Components': Attitudes, knowledge and skills concerning subject matter and organization relating to University Departments. (Fullan & Pomfret, 1977, pp.361-365).

c. The Learning 'Process': In this variable, application of principles of the learning process is seen as essential for the implementation of change.

Criteria for the final variable of the implementation model, that of 'Influencing Factors', remain to be identified. This in turn involves identification of units within the user system which embody greatest real potential for effective development through application

of learning principles.

INFLUENCING FACTORS AND THEIR CRITERIA

Most studies ignore the primacy of departmental decision making as an influencing factor in the implementation process. However several indicate the necessity for such a focus, and raise the question 'Who is best equipped to determine appropriate content and patterns of staff development for a particular situation? (Startup, 1979; Havelock & Huberman, 1977; Kemis & Hughes, 1979). These studies focus attention on the problem of defining the 'Influencing Factors' of implementation, (Figure 4). Complexity of organizations and the range of changes possible, suggest that factors with potential for influencing implementation are both numerous and diverse in character.

In single school systems for instance, complex influencing factors nominated have been, resistance to change, barriers to implementation, and management (Gross et al, 1971, p.202). In the macro school system, influencing factors empirically derived from a range of studies are subsumed under such complex variables as characteristics of the innovation, implementation strategies, characteristics of adopting units and of socio-political units (Fullan & Pomfret, 1977, p.367-368). Within higher education, an analysis of innovation includes such influencing factors as conflict level, visibility, gain-loss and leadership (Berg & Ostergren, 1977, p.22). Because the factors are complex, it has previously been necessary to identify major categories and their attributes.

However the criterion for accepting or rejecting a factor as 'influential', is its potential for affecting the learning process which governs change in personnel, artefacts and relationships within the system.

AUTONOMOUS SMALL GROUPS AS THE UNIT FOR CHANGE

The special attributes of university organizational structures, with stress on autonomy and specific expertise, provide cues not only for identifying the units within user systems most susceptible to planned change, but also for identifying appropriate strategies of implementation. Support for this view is provided in the statement:

Departments (or Schools or Faculties) have autonomy by tradition: it is reinforced by the general value system of their institution; by their exclusive line on an area of knowledge and by their acknowledged claim to unfettered use of, more or less, guaranteed resources...There is control over the way individuals behave and the way they organize their time but this is exercised within their department.

(Hewton, 1980, p.211)

Where autonomy is threatened, or commonality of expertise and interests is absent, opposition to change and change agents appears more likely. 'Central dictates and local autonomy simply do not harmonize' (Hewton, 1980, p.211).

An examination of academic hierarchies shows that the clearest examples of staff groups having both autonomy and commonality of expertise and interests, occur below faculty level, in departments responsible for the direction of studies in discrete subjects. Moodie and Eustace (1975, p.61) point out that "whatever the precise boundaries of departmental autonomy, its existence makes of every university a 'federal' structure rather than a strongly centralized system. The need for staff development...is one which remains the prerogative of individuals and their departments...it is the attitude prevalent in the department which determines the degree of staff participation in any centrally organized scheme." (op cit. p.211).

Departments then may legitimately be viewed as acting with relative autonomy. It would appear however that staff development programmes which are not initiated by departmental heads or staff, hold little potential for success (Warren Piper and Glatter, 1977, p.25). In short, departments comprising relatively small groups of highly

autonomous staff may hold the greatest potential for effective initiation, maintenance and directing of staff development activity.

`INNER-DIRECTED' STAFF DEVELOPMENT.

Learning has been identified as the process controlling implementation of specified changes in staff development. If learning is determined by principles concerned with goals, effects and involvements then it seems a tenable proposition that staff development practices should be based upon those factors.

What are the implications of such a premise? For an answer it is necessary to give further attention to the problem raised above, namely, 'Who is best equipped to determine the most appropriate content and patterns for staff development in any specific situation?'

The locus of an innovation's source and control base, whether informal or bureaucratized, has potential to facilitate or negate the implementation of change. For instance while innovation may succeed in small departments, growth in numbers leads to the formation of common interest groups holding different perspectives. These differences reduce possibilities for consensus and change is increasingly determined by others. "In such a climate, the oracular, the opportunistic and the officious in higher education research units will find the invitation to play a larger technical-managerial role in the improvement of higher education institutions hard to resist" (Kemmis & Hughes, 1979, p.2).

In such circumstances staff development may become "other" directed, that is, under the control of managers external to personnel closely involved. On the other hand in smaller units it may be "inner" directed and under the direct control of those immediately involved.

The "other" and "inner" directed loci of control are exemplified in the principle of ownership of an innovation as succinctly expressed in Freire's (1970) "banking" and "problem posing" sources of educational change. Similar dichotomies are expressed in Fullan and Pomfret's (1977) 'user' versus 'managerial' perspective, in Jalling's

(1980) 'faculty' versus 'administrators' view of academic freedom, and Rogers and Shoemaker's (1981) 'collective' versus 'authority' polarization of decision making. Such dichotomies however have limited use.

A more functional pragmatic alternative is provided by Dalin (1976) in a modification of the user-managerial model. This derives validity from the reward principle of the learning process, in that it focusses on those who benefit.

The classical problem in the management of educational change is the fact that the groups we are talking about, namely, (1) those who benefit, (2) those who decide and (3) those who have to change, are often individuals and groups with different roles. They live and work apart from one another, and the result is alienation.

(Dalin, 1976, p.19)

Where 'those who have to change' are also those affected by the benefits, (as they define benefits from their own perspectives), the process of learning becomes more probable and implementation more likely. Several observations may be made in justification of staff development programmes directed by those who are to benefit.

Within small autonomous groups represented by university departments, an inner-directed approach to staff development programmes exemplifies principles of the learning process. For example, in relation to 'goals', members are affected by specific constraints peculiar to any given situation at any given time that determine the relevance of any suggested goal. Goals are directed toward personal, immediate, or future oriented benefits. The clarity of goals is deeply based in the past experiences and future expectations of participants. It is likely to maintain a general consistency over time commensurate with the stability of the group composition. The best intentioned outsider cannot provide initial goals having such clarity and relevance. Nor can they modify those goals effectively to match the reality of changing situations affecting day to day activities of group members (Eraut, Connors & Hewton, 1980, p.41).

A second example concerns "effects". The autonomous group is not only able to provide day to day feedback arising from practical situations. It also provides the interactive reinforcing and rewarding acts that maintain energy, direction and a supportive climate based in commonality of interest and purpose.

A third example has regard to "involvement". Staff development activities tend to be something done by others, to or for those in need. In such situations attention is directed to coping with unfamiliar concepts, vocabulary and personnel from different disciplines. With such distractions, both participation and the interactional climate are reduced in effectiveness.

It could be claimed that staff development centres and their various personnel are capable of providing services based on the learning process. However the fact that they are from outside the nuclear groups involved, will of necessity tend to limit not only their contacts and commitment but also the relevance of experiences brought to specific situations.

Several studies support this benefit oriented, inner directed approach to staff development. Hewton, Becher, Parlett & Simons (n.d., pp.29-30), emphasise the need for a shift from conventional forms of training towards cooperation and dialogue. Bennis and Schein (1965, p.336), make a strong case for "individuals to participate directly in the decisions that are relevant to their work". Berg and Ostergren (1977, p.127), indicate that "in some way, the implementors of the innovation should have participated in its design, creation or development, so that they experience ownership". Rogers and Shoemaker (1971, p.286), report that French et al.(1971) found "participation led to satisfaction only when the system's members felt that their participation in decision making was legitimate rather than superficial".

In short, individually meaningful participation in implementation is essential. Such inner directed involvement is a valid focus for success because it deeply affects aspects of the learning process.

'Other directing' professionals such as change agents, outside advisers and consultants, can have a useful role in staff development, but it is the contention of this study that to be effective their function must embody the process of learning. If this criterion is not met the situation arises where "consultants, while providing greater objectivity, credibility and expertise, at the same time create resistance by destroying self-reliance and work against the creation of campus resources" (Bergquist, 1977).

SELF REFLECTION IN A CRITICAL COMMUNITY

A curriculum evaluation model proposed by Kemmis and Hughes (1979), indirectly exemplifies the majority of principles introduced above. 'Self-reflection in a critical community' (op cit, p.1), is based on a belief that in university departments there is always a significant level of convivial activity. This is an adaptive and evolutionary process of social negotiation and decision making. Decisions made through these activities are seen as open to correction in the light of experience and thus the organization of departments may be adjusted to meet new needs.

Claims concerning the necessity for recognition of time and contextual specificity are supported by Kemmis and Hughes' (1979) observation that "the present approach begins from the assumption that programmes and their justifications are time-dependent and evolve through time, and that they are contextually embedded" (p.6). The functioning of the process of self reflection is clearly outlined as a process of negotiating between aspirations to greater awareness and a tendency to suppress new ways of thinking, organizing or acting. The authors urge those involved to set out their principles, plans and practices so that they are available for comment.

The Kemmis and Hughes model has been developed for curriculum evaluation in higher education. The underlying principles however are relevant for the present study.

Further support is provided by several studies indicating that

ownership, responsibility and accountability must be initiated by and remain vested in nuclear groups. (Rose & Nyre, 1977; Lindquist, 1979; Rose, 1977). Such groups must use available resources if consistent advances are to be realized.

Gaff (1975, p.110) lists disadvantages of a faculty group approach to staff development as lack of time, expertise, knowledge, continuity of personnel and limited perspectives. It is claimed that these disadvantages can be overcome by setting up informal committees to shape policy, supervise implementation and approve staff hiring. On the other hand a committee model may have little utility, if the result is control by outsiders. These 'others' are divorced from immediate belonging in small directly responsible groups. They endeavour to initiate change from outside the user system. The informal nature of the proposed committee is not in question but rather the composition of a membership not intimately involved in day to day decisions and the long term repercussions of those decisions.

A further reason why committee models, whether formal or informal, have limited value is recognized by Gaff (p.127), "They simply have not been able to reach out to include a large interest among faculty, they would simply be unable to respond effectively to the demand".

Despite many writers recognizing the importance of involvement and ownership by faculty, in each case this is seen as directed by agencies external to the nuclear group (Rives, Jabker, Morreau, Sharpham & Van Egmond, 1979, <principle 7>; Berg & Ostergren, 1977, p.127; Kemmis & Hughes, 1979, p.1). Buhl (in Lindquist et al, 1979, p.215) stresses the need for a critical mass of faculty to be involved and relates this to the learning experiences of students. Nevertheless Buhl appears to lack appreciation of the negative effects of direction and control by persons not directly involved.

SUMMARY

Broad principles identified thus far provide guidelines for an alternative approach to staff development that seems worthy of further investigation. These broad principles are:

1. Existing small autonomous groups are best situated to determine appropriate initial content and patterns for staff development.

2. An 'inner-directed' approach is more likely to result in appropriate decisions concerning content and patterns for staff development programmes. Such decisions arise from the identification of problems relevant to specific community referenced situations while remaining open to scanning by the critical community of peers.

3. Groups seeking to implement innovations in specific situations may require consultancy services and resources relevant to their perceived needs. However, decisions concerning relevance and direction best remain a prerogative of the group immediately involved.

4. A realistic time scale, evolutionary in character rather than revolutionary, is necessary for implementation (Buhl, 1979; Rives et al, 1979).

In short, assessment of staff development practices indicates growing frustration concerning ineffective implementation strategies.

Assessment of current attitudes indicates a fixation on bureaucratic, other directed administrative structures, administrative desire for accountability and a lack of appreciation of the problems created by the multifaceted nature of the academic role.

Assessment of current theory indicates inadequate conceptualization of the generic process controlling effective development in staff activity, and coincidentally, of criteria for identifying factors influencing user systems.

A case has been advanced for a model of staff development in which a range of interdependent factors, with potential for influencing the learning process, are brought to bear on components of innovating user

systems. An overview of generic learning principles essential to this model has been presented with particular relation to advantages arising from staff development based in small, inner-directed autonomous groups.

The confluence of evidence and developments previously presented results in a general hypothesis that more effective staff development programmes may be achieved if they are initiated by problem posing, problem solving approaches. It is further hypothesized that these would be most effective if initiated and directed within small, autonomous community referenced groups.

The problem then becomes that of operationalizing these propositions in a research design that can assess their validity.

CHAPTER 4

METHOD

The purpose of this chapter is to present research methods used in the investigation and explain how they were used to obtain data. After an introduction reiterating focal constructs, the chapter contains four sections dealing with hypotheses, sample, instrumentation and treatment.

INTRODUCTION

The study examines effectiveness of different staff development practices in implementing change in tertiary teaching.

In Chapter 3 it was concluded that any investigation of staff development must analyse relationships operating between constructs in a specified system as a whole (Lewin, 1951; Berg & Ostergren, 1977; Rogers & Shoemaker, 1971). The constructs presented are held to be essential for explaining conditions under which change occurs. "To predict which changes in conditions will have what results we have to conceive of the life of the group as the result of specific constellations of forces within a larger setting" (Lewin, 1951, pp.173-174). Such a wholistic 'setting' determines the structure of this study.

It is believed that the greater the disparity between staff development activity and the normal dynamic interrelationships of the 'setting' in which it takes place, the more difficult it is to implement change. Under such circumstances the system ... "has very little energy left for innovation and change. Most of its energy is spent in maintaining existing structures and operations" (Dalin, 1978, p15).

Also in Chapter 3, the centrality of the learning process in

implementing change in innovating systems was detailed. The question was raised, 'to what degree do interrelated factors influence the learning process so that designated changes are implemented?' System energy can assist the implementation of change through members being involved in staff development activities. However, it appears reasonable to suggest that these activities may be more effective if based on factors which determine learning and utilize existing norms and dynamic interrelationships of the professional reference group (Havelock & Havelock, 1973, p20).

Change in instructional behaviour is not only influenced by attitudes, knowledge and resources, but also by the interrelationships of these factors in a total system. Change in one influences change in others. Changes in knowledge may affect attitudes, but it is their interaction that also determines instructional behaviour.

The survey of relevant literature and research studies presented in previous chapters provides support for the tentative theoretical generalization that;

'the effectiveness of staff development programmes is dependent on application of the principles of learning to the immediate problems and interests of small self directed groups'.

Staff development strategies arising from the concepts contained in this generalization provide focal constructs for the study. Methodology is based on constructs previously discussed, namely, small self-directed groups, the learning process, existing system structures and implementation of change in instruction.

In practical terms the study can be summarized as;

an investigation of changes brought about over a five year period relating to inner-directed group procedures in comparison with those relating to traditional staff development procedures.

Benchmark data on staff attitudes, knowledge and behaviour concerned with instruction were obtained. A range of staff development

procedures including lectures, courses, seminars, assistance to individuals and a variety of sensitizing activities were implemented over a five year period and post intervention data obtained.

HYPOTHESES

Research cited in previous chapters provides guidance as to which methods are likely to contribute to change in the teaching roles of tertiary staff. Experimental and survey results reviewed, concerned inner-directed groups and the causes of desired change (Berg & Ostergren, 1977, pp141-142; Startup, 1979). These indicated that staff involvement is of primary importance. Still further research confirmed the validity of specific learning principles. In addition, evidence presented indicated considerable support for a perception of staff development focussed on actual implementation of behaviour, rather than mere dissemination of knowledge. In all, the evidence indicates the importance of interactional structures, role behaviour, value internalization and understanding of the innovation (Fullan & Pomfret, 1977, pp336-337). Argument was presented that these variables are encompassed by an inner-directed, small group approach to staff development.

To maintain consistency with the main purpose of this study, evidence is being sought to evaluate the effectiveness of modes of staff development, (particularly inner-directed small group structures), in implementing change in tertiary teaching roles. Conflicting evidence, (as presented above), has arisen from wide differences in values, cultural preconceptions, research methods and demographic groups. However, general trends in these previous studies appear to indicate that staff development practices favouring user perspectives and based on principles of learning may increase implementation. It seems probable that if situations are established and maintained where small groups of staff,

- a. have common concerns and operating environments,
- b. identify relevant tasks and problems,
- c. use self reflective and convivial methods,
- d. and provide mutual criticism and support;

-then, implementation of attitudinal, knowledge, and skill outcomes will increase, in comparison with those resulting from existing traditional staff development procedures.

These research findings, when combined with the summative theoretical generalizations outlined, would seem to suggest a number of logically derived hypotheses.

Therefore it was predicted that:

1.1 Inner-directed staff development is related to significant change in instructional behaviour.

Change in instructional behaviour is accompanied by less directly observable changes arising from knowledge of instructional methods. Such knowledge may arise from a range of stimuli including modelling, personal study, formal training or the results of trial and error. Research evidence indicates that staff development programmes are effective in changing knowledge and understanding of new methods, resources and curricula (Young, 1982; Marques, Lane, Dorfman & Rice, 1979; Berg & Ostergren, 1977; Hoyt & Howard, 1977). Therefore, whatever the reasons for staff involvement in development programmes, whether inner-directed or other-directed, the probability is for some degree of change in knowledge. Such changes are necessary but not always sufficient to bring about modifications to instructional behaviour.

Therefore it was further predicted in the form of null hypotheses that:

1.2 There will be no significant difference in the change of knowledge of instructional methods between staff involved in other-directed staff development when compared with staff involved in inner-directed staff development.

1.3 Change in knowledge does not contribute to significant differences in instructional behaviour.

A further determinant of implementation involves the individual's attitudes for or against a specified change. Previous research indicates that attitudes, like motives, arouse and direct purposeful activity (Good & Brophy, 1974; Marjoribanks, 1976). Where negative attitudes are held concerning specified change, the probability of that change being implemented appears to be diminished. Where a specified change is not reflected in positive values held by those involved, some modification to those values would appear to be necessary before change can readily occur. Peer support and commonality of purpose can be instrumental in modifying attitudes and perception of relevance. These in turn can increase 'approach responses' to role related behaviour (Mager, 1968).

It is therefore predicted that as the consequence of research intervention;

2.1 Inner-directed staff development contributes significantly to change in attitudes to instructional behaviour.

2.2 Other-directed staff development does not contribute significantly to change in attitudes to instructional behaviour.

2.3 Changes in attitudes contribute significantly to changes in instructional behaviour.

Neither the learning of new knowledge nor change in attitude is necessarily related to changes in behaviour. Havelock and Havelock (1973) report that there was no significant relationship between what teachers honestly believed in or thought they were doing in their classrooms as compared to what trained research observers or their children saw them doing.

Some staff development practices do however result in positive changes to both knowledge and attitudes of staff concerning instructional behaviour. In such situations the interaction of knowledge and attitude essential for implementation of new skills in an individual's teaching repertoire has occurred. The case has also been made that staff development practices based on principles of the learning process are essential for successful implementation.

It is therefore further predicted that;

3.1 Isomorphic change in both attitudes and knowledge contributes to significant change in instructional behaviour.

SAMPLE

The sample involved the full complement of teaching staff in nine departments of the faculty of Agriculture and Horticulture at Massey University, from the beginning of 1979 through 1983. Only staff not involved in some form of direct teaching with students were excluded. The initial sample numbered 82. This reduced to a final sample of 64 teaching staff employed by the university throughout the five years of the study. Reasons for reduction in the original number included; deceased, no longer employed at the university, no longer teaching at the university, and, on leave during 1983.

The ages of those involved ranged from less than 25 years to 65 years. Status encompassed all categories of staff from part time tutors to professors, heads of department and dean of the faculty. University teaching experience ranged from a few weeks to more than fifteen years.

While all staff participated in both pre and post treatment interviews and questionnaires, only 34 agreed to being videotaped during actual teaching sessions. Of these 34, withdrawals from the faculty during the study resulted in just 19 staff being available for post intervention videotapes. Thus only 19 sets of both pre and post treatment videotapes have been used.

The heterogeneous nature of the sample would appear to be representative of university teaching staff engaged in teaching in departments of New Zealand universities. This generalization also applies to staff participating in videotaped observations. All were volunteers, thus providing a common basis for between group comparisons.

Staff were allocated to groups on the basis of types of staff development activities in which they actually participated during the period of the study.

GROUP CHARACTERISTICS.

At the conclusion of the five year research period, three staff groups were identified. Those participating in little or no staff development activity, those involved in essentially Other-directed staff development, and those operating in small Inner-directed groups resulting in staff development activities.

Records were kept of participants' involvement in formal curriculum and staff development activities. In addition staff were interviewed at the conclusion of the research period to ascertain any degree of involvement in staff development activities outside the researcher's knowledge. These included seminars conducted by overseas consultants and resource personnel from other faculties.

Staff having two or less attendances at some form of seminar, workshop discussion, lecture or demonstration (over the 5 year period), AND, no Inner-directed group involvement with potential for providing new knowledge, attitudes or skills in curriculum or personal development, were categorized in the Low Involvement (L.I) group (n=33).

Staff with three or more attendances at curriculum or personal development sessions as outlined above, AND, little or no involvement in small Inner-directed groups were placed in the Other-Directed involvement (O.D.I.) group (n=17).

Moderate to high participation in small Inner-directed group activity directed at staff development, resulted in categorization in the Inner-Directed Involvement (I.D.I.) group (n=11).

A three tiered decision making system was devised to ensure

validity of allocation of staff to group membership. Firstly, a senior staff member from each large department or having responsibility for a degree team, was thoroughly briefed on the criteria of Inner-directed participation. These senior staff were then involved in the development and trialling of a survey form and finally nominated staff to the groups described above. Secondly, all staff were asked to determine whether they had participated in an I.D.I. group and if so, to nominate the other members with whom they had been involved. The form for this purpose was trialled with senior staff. (See Appendix C). Thirdly, the function of each group identified through these processes was then examined by the researcher to determine whether it was initiated and maintained by administrative or 'other-directed' sources. Information supplied by individuals was considered, (a), in the light of categorizations provided by senior staff, (b), from reciprocities provided in the responses of staff nominated as inner-directed group contacts and (c), observations over time by the researcher. Triangulation aspects of this process are based on the 'reciprocity of perspectives' principle (Schulz, 1962; Cicourel, 1973). Details of the triangulation technique (Cicourel, 1973) used in allocating subjects to these three groups are provided above in the section on 'Group Characteristics' (p.71). Involvement ratings, inner-directed exposure scores and research group allocations are presented in Figure 6.

INSTRUMENTATION

A Common Basis for Survey Instruments.

Criticism can be levelled at many surveys which rely on reported use of methods, resources or organization. Such techniques reveal only attitudes toward implementation, not knowledge and skills necessary for implementation. Also open to criticism is research which focuses on learning outcomes but excludes evaluation of other aspects of the process of change, such as staff implementation behaviours or degree of implementation.

FIGURE 6

TRIANGULATION SCORES			STAFF DEVELOPMENT PARTICIPATIONS	
	Score	n.	Score	n.
INNER-DIRECTED				
INVOLVEMENT	31	1	7	1
GROUP	24	1	6	1
	20	1	5	1
	14	2	4	4
	13	1	3	4
	12	2		
	11	1		
	10	2		(Group n.=11)
OTHER-DIRECTED	9	1	7	1
INVOLVEMENT	6	1	5	1
GROUP	5	1	4	8
	3	1	3	7
	2	4		
	1	4		
	0	3		
	N.A.	2		(Group n.=17)
LOW INVOLVEMENT	10	1	2	7
GROUP	8	2	1	15
	7	1	0	11
	6	1	N.A.	1
	5	1		
	4	2		
	3	2		
	2	4		
	1	6		
	0	14		(Group n.=33)

In many surveys there arises a problem of maintaining consistency between the focal problem addressed by the study and sub components of the research model. In relatively simple one-to-one relationships such as exist between reinforcement and a specified behaviour change, consistency does not constitute a major problem. However, if an investigation concerns such diverse variables as attitudes, knowledge, perceptions of behaviour and measures of that behaviour as descriptors for the superordinate category of 'instructional change', a common basis is necessary. Such basis should reflect interrelationships existing between each aspect of the superordinate change. For example, one aspect of instructional change may be to increase feedback to students. This would involve not only criterion referenced feedback behaviour, but also staff knowledge of feedback techniques and staff attitudes to providing feedback.

To reflect the interrelationships with validity, consistency of attributes between each measure is essential. That is to say, each should provide data from a common basis in theory to illuminate the common focal problem. The fact that attitudes change, or knowledge has increased, or a new skill can be demonstrated, is of limited value when each is taken in isolation. It is the relationship between the three, and the contribution of each to a discrete outcome that provides greater understanding.

The case has been advanced that the process involved in implementing change is that of learning. Outcomes of the learning process include changes in attitudes, knowledge and behaviour, and it is held that the process is essential for the explanation of staff development outcomes. As such it has been used in this study as the integrating factor for measures used and also to maintain consistency between the focal problem and sub components of the research model.

For all measures, principles of the learning process provide a common integrating base. The principles are developed in detail elsewhere (Ashcroft, 1978, 1982, 1983). A summary, expressed as 10 instructor behaviours and the criterion competencies for each, is presented below (Figure 7). In addition, the principles of learning

Figure 7.

<u>Essential</u> <u>PERFORMANCES</u> (Determinants of Learning)	<u>Necessary Instructor</u> <u>CRITERION COMPETENCIES</u>		
INSTRUCTOR ENSURES			
A	<table border="0"> <tr> <td style="vertical-align: top;"><u>OBJECTIVES</u> <u>ARE</u> <u>UNDERSTOOD</u></td> <td style="vertical-align: top;"> <ol style="list-style-type: none"> 1 Stating objectives clearly 2 Discussing objectives with the trainees 3 Providing a simple "focussing problem" 4 Having trainees state or write object in own words 5 Using behavioural objectives where appropriate 6 Reactivating objectives during learning sequences <ol style="list-style-type: none"> a Stating, discussing and clarifying emergent objectives b Planning and activating "Hidden Agenda Objectives" Methodically </td> </tr> </table>	<u>OBJECTIVES</u> <u>ARE</u> <u>UNDERSTOOD</u>	<ol style="list-style-type: none"> 1 Stating objectives clearly 2 Discussing objectives with the trainees 3 Providing a simple "focussing problem" 4 Having trainees state or write object in own words 5 Using behavioural objectives where appropriate 6 Reactivating objectives during learning sequences <ol style="list-style-type: none"> a Stating, discussing and clarifying emergent objectives b Planning and activating "Hidden Agenda Objectives" Methodically
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Essential
PERFORMANCES

Necessary Instructor
CRITERION COMPETENCIES

(Determinants of Learning)

INSTRUCTOR ENSURES

F	<u>THERE ARE</u> <u>MULTIPLE</u> <u>EXAMPLES</u> <u>OF CONCEPTS</u> <u>AND PRINCIPLES</u>	1	Stressing the obvious and concentrating on key ideas
		2	Providing a range of examples for each concept or principle
		3	Requiring a range of examples as proof of ongoing understanding
		4	Providing time for clarification and consolidation
		5	Summarizing and providing a simple overview

INSTRUCTOR ENSURES

G	<u>TRAINEES</u> <u>PARTICIPATE</u> <u>ACTIVELY</u>	1	Providing opportunities for trainees to discuss and question
		2	Ensuring trainees hypothesize and questions
		3	Using trainees' relevant ideas and questions
		4	Allowing trainees to use equipment themselves
		5	Allowing time for useful participation
		6	Providing time for trainees to record or explain their ideas

INSTRUCTOR ENSURES

H	<u>A RANGE OF</u> <u>SENSES ARE</u> <u>INVOLVED</u>	1	Planning for multi sensory stimulation
		2	Interrelating physical, verbal and intellectual activity
		3	Ensuring that TRAINEES use a range of media
		4	Using simulation activity
		5	Providing a RANGE of learning resources

INSTRUCTOR ENSURES

I	<u>ATTENTION IS</u> <u>FOCUSSED AND</u> <u>DISTRACTOR ARE</u> <u>MINIMIZED</u>	1	Eliminating potential sensory distractors
		2	Eliminating cognitive distractors
		3	Using undirected and directed play
		4	Providing for learning and practice in the performance situation
		5	Keeping media subordinate to the message
		6	Preventing divided attention situations

INSTRUCTOR ENSURES

J	<u>THERE IS A</u> <u>POSITIVE</u> <u>LEARNING</u> <u>CLIMATE</u>	1	Showing the trainee he is valued
		2	Spending the time necessary to know each trainee
		3	Using names in personal and written interaction
		4	Eliminating or reducing counter productive threat
		5	Providing time and/or space for "withdrawal"

outlined above and detailed previously (Ashcroft, 1983) also provide the basis for all instrumentation used in this study.

THE MEASURE OF ATTITUDES TO INSTRUCTION

A major difficulty in assessment of attitudes is raised by the cueing function of questions and of researcher status, that elicits responses biased by an expectation effect (Hayman, 1968, pp74-76). The Critical Incident Technique (Flanagan, 1954) has been modified to overcome this problem.

The study of attitudes has been somewhat limited and difficult to interpret because of almost exclusive reliance on verbal statements of opinions and preferences. The critical incident technique has been applied in a few instances to gather factual data regarding specific actions involving decisions and choices. These studies suggest that critical incidents of this type may be a valuable supplementary tool for the study of attitudes.

(Flanagan, 1954, p.353)

Some inappropriate functions of the system for the present study have been overcome by excluding opinion based questions from the interview schedule, by targeting questions on recent professional experiences of participants and by devising a criterion referenced classification system for specific attitudes concerning instructional behaviour. At no stage is the participant asked to express an opinion or reveal an attitude.

A series of open questions concerning participants' recall of both particularly good and particularly unsatisfactory teaching sessions was followed by further questions relating to perceived future needs of tertiary teachers. Initially, staff were asked to describe and discuss their field of interest. Once rapport was established they were asked to describe a recent, particularly good teaching session and any subsequent effects.

1. "Think about your teaching this term. Can you recall a particularly good teaching session? One that went particularly well?"

2. "Was there anything that you did prior to the teaching session that contributed to its success?"

3. "How did you use this during the teaching session?"

Then followed a similar series of questions concerning a recent unsatisfactory or disturbing teaching session.

1. "Can you recall any recent teaching session that was fairly disastrous?"

2. "Was there anything that helped cause the disaster?"

3. "What did you actually do during the session?"

Finally participants were asked a series of questions, relating to more general experiences of tertiary teaching.

1. "What factors prevent you from being a better teacher?"

2. "If staff training were offered what sort of thing would you like to see included?"

For the complete 'Interview Schedule' see Appendix A.

Participants were interviewed individually in their offices and guaranteed complete anonymity. Rapport was established by having each explain their special fields of interest. Requests for clarification of schedule questions were met by stressing key words or phrases in the original question. Any further questions were answered by providing an example relating to the participant's field of experience. Interviews, which took between 37 and just over 90 minutes were audiotaped and transcribed. All transcripts were checked against original audiotapes for errors and omissions and, where necessary, corrected.

Transcripts were then subjected to detailed scanning to identify phrases indicative of attitudes relating to principles of learning. 218 concepts were identified.

The 218 phrases or concepts were grouped initially within eight determinants of learning (presented as "Performances" in Figure 7), on the basis of their reflecting one or more "Criterion Competencies" of a specific category. For instance phrases indicative of a concern for using students' experiences, the real world, practical or real situations and future oriented content were held to reflect competencies listed under Section B, Figure 7. The majority of the 218 concepts were grouped within the 23 criterion competencies identified. These are listed and asterisked under Categories 1,2,3,4 and 7 of Figure 8. All remaining concepts were grouped under eight further criteria subsumed under the two categories of "Attitudes to personal accountability" and "Attitudes to inner directedness". These criteria are listed and asterisked under categories 5 and 6 of Figure 8. In all 31 attitudinal criteria were identified and grouped to yield 7 generic attitudinal categories relating to the learning principles which provide the focus for this methodology. Each Category was criterion referenced to a finite set of characteristics ranging from 3 to 6 in number.

Reliability testing of the initial instrument by a team of ten postgraduate Education students and staff resulted in simplification of vocabulary, provision of examples for each value and the transfer of one value to a different generic category. This involved the use of multiple copies of interview transcripts not used in the study due to the participants not being available for repeat interviews five years later. When training in identification of relevant phrases and their categorization within the system resulted in inter-coder reliability in excess of .85 on three successive occasions, coding of transcripts was commenced.

Unnamed transcripts were allocated to coders in scrambled pairs. This ensured that both pre and post treatment transcripts for each staff member were marked by the same coder thus reducing any remaining intercoder inconsistency. When initial coding was completed, statements indicative of each generic learning category were checked against the specified criteria. This resulted in item rejection and transfer of less than 2%. Final variables, shortened category

descriptors and criterion values for each attitude are detailed below (Figure 8).

FIGURE 8

CATEGORIES OF STAFF ATTITUDES TO INSTRUCTION

Category 1. LEARNER CENTRED

Expresses concern to meet student needs and differences.

This concern is shown through statements indicating desire to:

- * have personal contact with students,
- * to communicate with students,
- * to elicit student opinion,
- * to reduce unproductive stress for students,
- * to meet individual needs.

Category 2. OBJECTIVES ORIENTED

Expresses concern for student awareness of objectives.

This concern is shown through statements indicating that:

- * objectives are, or should be, provided to students,
- * students should use objectives in their study,
- * objectives are, or should be, discussed with students.

Category 3. RELEVANCE ORIENTED

Indicates concern for student perception of subject matter relevance.

This concern is shown through statements indicating interest in:

- * using students' experiences and ideas,
- * using real situations as examples,
- * providing practical experiences,
- * future usefulness of content for students.

Category 4. STUDENT-INVOLVEMENT ORIENTED

Expresses concern for student involvement in teaching situations.

This concern is indicated by statements showing that:

- * student participation is desirable,
- * passive recording and reproduction of content is undesirable,
- * discussion groups are a useful teaching method,
- * students' questions are welcome,
- * material is distributed prior to teaching periods.

Category 5. ACCOUNTABILITY ORIENTED

Agrees with teacher accountability and responsibility for teaching outcomes.

This agreement is shown through statements indicating a desire for:

- * improvements in personal teaching quality,
- * greater knowledge of teaching methods,
- * keeping up-to-date with knowledge and research,
- * being constructively critical of self,
- * minimizing effects of indiscipline on other students.

Category 6. INNER-DIRECTED

Expresses acceptance of personal rather than 'Other-directed' locus of control.

This orientation is shown through statements indicating willingness to:

- * use and allow autonomy in self and others,
- * seek solutions alone or with others,
- * identify and solve problems as they arise.

Category 7. MOTIVATION ORIENTED

Accepts the need for reinforcement, feedback and motivation for students.

This acceptance is shown through statements indicating that:

- * teaching sessions should be enjoyed by students,
- * student questions are used for teaching purposes,
- * marks are used to motivate students,
- * student interests are used for teaching purposes,
- * success is praised and rewarded,
- * realistic and common problems are identified and solutions sought.

THE MEASURE OF INSTRUCTIONAL KNOWLEDGE.

Principles of learning were used as the basis for information areas surveyed by questionnaire. These generic areas matched with those of the attitude measure except for the addition of demographic details, knowledge of teaching methods, teaching aids, assessment and personal rewards of teaching.

Each generic area was examined through the use of between 3 and 7 cross referenced 'critical referents' to permit evaluation of response reliability (Kerlinger, 1973, p.413). Questions were expressed in terms calculated to elicit information concerning staff knowledge of 'learning related' methods of instruction. The claim that specific methods are used or that certain attitudes are held, only gives information of the participants' knowledge concerning the principle concerned. "Questionnaires may be effective methods of assessing user's knowledge and understanding of the philosophy and basic strategies of an innovation program, provided that both specific questions are asked and open-ended questions are used to assess various aspects of respondents' thinking and approaches to the innovation" (Kerlinger, 1973, p.366). Closed questions were used for most questions. Open ended questions were asked when information was

required on staff enjoyment of teaching, teaching methods, teaching aids, perception of distractors and motivation practices (Refer Appendix B).

The questionnaire was trialled with 31 university staff representing 12 departments, and discussed to determine content validity with individual staff from 4 departments; Education (4), Agronomy (1), Veterinary Science (1), Psychology (1). After modification the questionnaire was posted to all teaching staff in the faculty of Agricultural and Horticultural Science, Massey University. Completion rate was 99% with only one staff member declining to participate. In 1983 the questionnaire was again administered to all available original staff. A 100% return was obtained.

In addition to providing information on changes in knowledge concerning discrete areas of learning, combinations of critical referents provide compound scores on each of the generic learning categories, thus allowing comparisons with attitudinal changes. Questions related to each category were spaced throughout the questionnaire. The questions, and item numbers from the questionnaire relating to 'Knowledge of Objectives' as listed below, provide an example of these combinations.

10. In your opinion how important is it that students should be clearly aware of your objectives before each lecture?

12. How competent do you feel in writing objectives that will enable your students to study more effectively?

36. At the beginning of last year, to what extent did you give your students an overall description of the course you were going to teach?

37. Did you ensure that the goals of the papers you taught last year were made clear to your students?

38. How confident are you that your examination questions were related to your lecture content?

46. At the beginning of each lecture or group of lectures did you advise students of your specific objectives?

47. Before each field trip or laboratory exercise were your

objectives clearly explained to your students?

Comparison of pre and post treatment data yielded individual and group scores on changes in staff knowledge of teaching.

As indicated by Fullan and Pomfret (1977) the questionnaire method is useful in assessing degree of implementation, provided it is specific and validated with other methods. The most valid method for assessing implementation of instructional methods would be direct observation. "The use of observation probably represents the most rigorous measurement of behavioural fidelity or degree of implementation if the innovation is reasonably well specified" (Fullan & Pomfret, 1977, pp.352-355). A brief description of the observation instrument developed and used to measure teaching behaviour in this study is outlined below.

MEASURE OF INSTRUCTIONAL BEHAVIOUR.

Most classroom interaction analysis systems are concerned with teacher or student behaviour. Systems are generally used, together with principles derived from educational psychology, to determine paths of action for trainers, instructors or teachers. It is only by focussing on factors known to have a direct effect on learning, that interaction analysis systems can provide information directly relevant to improvement in teaching techniques.

For example, research evidence is quite clear as to the effects that students' knowledge of objectives can have on learning. Mager and McCann (1961), demonstrated that when students were given objectives and the form in which the objectives would be tested, time needed for learning was reduced by two thirds. Learning is more efficient when learners are very clear as to what they have to learn. An interaction analysis system that provides clear evidence concerning instructor and student use of objectives provides evidence of the implementation of an instructing technique based on learning principles.

Similarly, it is known that behaviour is affected by its consequences. Where instructors use appropriate reinforcers for correct learning behaviours, those behaviours increase in probability and learning potential is increased. Instructors who analyse their own teaching behaviour and find they provide few reinforcers for their students may improve the learning potential of instructional periods by increasing the frequency and appropriateness of reinforcers for learning-oriented behaviour.

The Determinants of Learning system developed for this study also provides the basis for 'A Measure of Learning Potential' (Ashcroft, 1983). (For full details see Appendix D). Ten factors known to affect learning have been used to create a system which allows observers to both assess the learning potential created by instruction and to analyse teaching behaviour with a high degree of objectivity. These ten factors, under which teaching behaviours may be quantified, are grouped within the three superordinate categories of Orienting, Instruction and Involvement.

In the Orienting cycle, student attention is aroused and activity is oriented toward the required learning.

An instructor who is effective in orienting students to learning will display capability in the performances of ensuring that:

- a. Objectives are understood
- b. Objectives are seen to be relevant by the learners.
- c. Arousal is at an optimal level.
- d. There is a positive learning climate.

In the Instructional cycle, instructors are presenting subject matter directly to learners who may or may not respond with answers or questions. It is typified by instructors giving information, providing different examples of concepts and principles and asking questions concerning the subject matter.

An instructor who is effective in inducing learning through direct instruction will display competency in:

- a. Ensuring that feedback is provided and used.
- b. Reinforcing correct learning behaviours.

- c. Providing a range of examples for concepts and principles.

The **Involvement** cycle is concerned with focussing student attention and activity toward desired learning outcomes. Attending can involve a range of senses such as listening, watching and touching. Activity likewise can involve any one of, or a combination of, physical, verbal and intellectual behaviours.

An instructor who is effective in inducing learning through student involvement will display competency by:

- a. Ensuring students participate in learning-oriented experiences.
- b. Using a range of learners' senses.
- c. Focussing attention and reducing distractions.

Apart from its use for the analysis of instruction, the system provides data that may be used by participants for modifying their teaching practices.

The system allows for three increasingly complex levels of analysis.

Level 1: The simplest application of the system involves coding instructor behaviours into one of four categories; Orientation, Instruction, Involvement or Neutral Informing. A limitation of this level is that categories may not be sufficiently detailed to provide useful feedback to participants. However, it does indicate imbalances, weightings and omissions involved in instructional behaviour.

Level 2: At this level 10 categories reflecting 10 principles of learning plus a Neutral Informing category are used. Within the subsuming category of Orienting observers assess whether there is a 'positive learning climate', whether 'objectives are understood' or seen as 'relevant by students', and whether 'optimal arousal' is being carried out. Under the category of Instruction, observers assess whether the instructor is providing 'multiple examples' of concepts and principles, providing 'feedback' to students or 'reinforcing correct

learning behaviour'. Under the category of Involvement observers assess whether students are 'participating actively', using a 'range of senses' in learning activities and whether student 'attention is being focussed'. Finally, observers assess the aspect of instructor behaviour labelled **Neutral Informing**. This includes information given once only, organizational information, simple neutral sociation and silence or confusion.

Level 3: At this, the most complex level, the full set of criterion competencies are applied. These define the 11 instructor performances covered in the previous paragraph and involve 60 specific competencies. For instance 'feedback provided' involves 3 observable criterion competencies;

- a. indicating correctness and reasons,
- b. giving usable feedback,
- c. reviewing key ideas.

Each of the other 10 instructor performances involves between 4 and 7 competencies which comprise the criteria for that performance. The third level of coding involves use of these 60 criterion competencies to analyse the degree of implementation of each instructor performance.

Level 1 analysis involves the use of the three major categories and **Neutral Informing**. Allocation of instructor behaviour to any category is determined by the criteria of 11 defined performances. At Level 2, observers use criterion competencies to justify allocation of instructor behaviour under any particular performance. By using Level 3, each decision is validated by reference to specific contributing skills and each aspect of instructional behaviour may be precisely categorized. Level 3 may be used to provide very specific data concerning the learning potential created.

Criterion competencies and contributing skills were derived, validated and developed over a 3 year period in consultation with experienced senior teachers and instructors (n=>200) from a variety of fields. Skills essential to a particular competency were hypothesised

on the basis of experience, trialled in practice, expressed in acceptable vocabulary and refined. All criterion competencies and contributing skills are expressed as observable specifics. The final interaction analysis system was fully trialled in 1983 with 24 staff teaching at Vocational and Industrial Training Centres in Singapore (Ashcroft, 1984).

METHOD

Videotapes of instructional situations were recorded and analyzed in order to provide baseline data on existing instructional skills. Post treatment video tapes were recorded wherever possible in the same venue and with the same type of student group as for the original recordings. While interviews can reveal attitudes, and questionnaires determine levels of knowledge, it is only by observing normal instruction in the day-to-day setting that actual skill in performance can be identified. Instructors were videotaped while teaching regular classes in regular venues and, (apart from the observation system), under normal conditions. Observations were recorded as unobtrusively as possible. Where possible all equipment was set in position and tested before students and staff arrived. Equipment was placed behind students and the camera moved as little as possible during recording. By using a remote monitor the operator was able to remain out of sight for many recording sessions. Instructors were fitted with a lightweight radio microphone either prior to entering the teaching venue or before teaching began.

Despite the above precautions, any intrusion into the private world of instructors will create modifications to the instruction and to the interactions that take place. The modifications are however those of detail rather than essence. Discussions with students and observation of instructors, prior to and after videotaping, confirm the relative normality of sessions included in the survey.

Subject to the constraints and reservations outlined above, observations were conducted under normal lecture theatre, laboratory, tutorial or field trip conditions. Timetabled classes were observed in

normally timetabled venues. It was impressed on instructors that a completely usual lesson with no special effort, materials, student activity or resources was required.

TREATMENT

Explicit and Hidden Objectives.

Objectives pursued by the researcher were in large measure in accord with the roles outlined above (Introduction, p.2). However, three hidden agenda were involved. Firstly, the aim was to sensitize staff, and more particularly existing leaders, to a wide variety of attitudes, knowledge and techniques having relevance for their instructional roles. To this end, requests for assistance expressed during formal individual interviews, at workshop-seminars and from individual approaches, were met where possible by offering a variety of alternatives rather than single solutions. Secondly, interactions with the nine departments comprising the faculty, were restricted to traditional forms of curriculum and staff development practice.

These included;

1. Canvassing of staff for expression of preferences and needs concerning course content and style.
2. Reacting to requests from individual departments, subject groups and common interest groups, for assistance with special topics. (e.g. Conduct of tutorials, assessment, mastery programmes).
3. Provision of resources in response to individual requests. (e.g. Student course evaluations, student seminars and assignment marking.)

The aim was to meet standard role expectations of those involved, while operating within existing traditional relationship and process norms of the faculty. This provided an experimental situation closely approximating the faculty under normal operating conditions.

The third and most difficult hidden agenda concerned that of identifying and servicing small Inner-directed autonomous groups arising in response to emergent problems. For the purpose of this study, such groups had to be already functioning or arise spontaneously as the result of perceptions of common relevance. Any Other-directed input such as dictates and requests for specific action from superiors in the hierarchy, had to be differentiated from Inner-directed sources of action. In addition group activities had to result in staff developing new knowledge and skill in curriculum construction, instructional roles or relationships with peers and students rather than mere application of existing skills and knowledge.

The programme was initiated at the conclusion of the 1978 teaching year in a series of four, half-day, workshop sessions voluntarily attended by representatives from nearly all departments. The workshops served as a basis for activities in the new degree programmes and as an introduction for ongoing consultancy during the following years. Early each year, similar intensive workshop based programmes were conducted together with a limited number of request initiated seminars, lectures and discussions. In addition, each staff member was involved in completing a questionnaire, participating in a personal interview and being videotaped while teaching, as outlined above. This provided many opportunities for interaction and servicing of individual requests. A summary of major contacts is provided below, (Figure 9).

To summarize, staff were initially surveyed in early 1979 for knowledge, attitudes and skills related to their instructional roles. During the following five years, existing problems, processes and relationships were used to initiate and maintain traditional staff development activity and to support activities of potential Inner-directed groups. In 1983-84, attitudes, knowledge and skills were again surveyed. Three levels of faculty participation in staff development activities were specified and results tabulated for each level. Three groups were defined based on the following criteria;

1. L.I. Group. Low involvement in both formal and informal staff development activities during the period under study, (n=33).

2. O.D.I. Group. Involvement in Other-directed formal and informal staff development activities, (n=17).

3. I.D.I. Group. Involvement in Inner-directed, small group, formal and informal staff development activities, (n=11).

Staff were initially involved in:

a. Interviews, to ascertain attitudes concerning the tertiary teaching role,

b. Questionnaires, to identify staff knowledge concerning tertiary teaching methods,

c. Videotaping of normal teaching episodes to identify existing patterns of teaching.

Two types of staff development procedures were initiated and maintained for a five year period. At the conclusion of this period staff were again surveyed with the instruments specified in a-c above. Results of the surveys are presented in the following chapter.

FIGURE 9

FORMAL STAFF-DEVELOPMENT COURSES

1978	4	HALF DAY	WORKSHOPS	OCT-NOV
1980	3	HALF DAY	WORKSHOPS	APRIL-MAY
	1	FULL DAY	SEMINAR-WORKSHOP	JUNE
1981	2	HALF DAY	WORKSHOPS	APRIL
1982	4	HALF DAY	WORKSHOPS	MAY
	1	2 HOUR	SEMINAR	JULY
	1	HALF DAY	LECTURE-DISCUSSION	APRIL
1983	1	HALF DAY	WORKSHOP	AUGUST
	1	2 HOUR	SEMINAR	OCTOBER

CHAPTER 5

STATISTICAL ANALYSES

In presenting the results of this study, demographic characteristics of the sample regarding age, sex, status, total teaching service, training and length of university teaching service will be described first.

Data is presented for each mode of staff development, (1= Inner-directed, 2= Other-directed, 3= Low Involvement).

Secondly, analysis of covariance with repeated measures is used to test hypotheses concerning the relationship between staff development programmes and changes in attitudes, knowledge and behaviour relevant to teaching roles.

Not only is the dichotomy of Involved (combined Inner-directed and Other-directed groups) versus Low Involvement examined, but the results of Inner-directed versus Other-directed modes of staff development are also compared.

Finally, an analysis of changes in the generic category of Behaviour, broken down into the contributing variables of Orienting, Instruction, Involvement and Neutral Informing is presented in relation to each mode of staff development. (Tables 41-43. Tables 56-58)

DEMOGRAPHIC DATA

Tables D1-D6 present data comparing age, sex, status, total teaching service, training and length of university service for all groups as frequencies and percentages. When statistics like analysis of covariance are used, the validity of results is dependent on groups having been proved to be homogeneous.

Involvement of subjects (n=62), in three modes of training

resulted in relatively homogeneous profiles across groups for these 6 demographic variables. There are no significant differences between groups. Chi-square measures of significance range from p=.146 to p=.859.

In effect these results indicate that the groups are relatively homogeneous in regard to demographic variables and the allocation of subjects to groups is equivalent to random allocation.

TABLE D1
TOTAL AND TYPES OF TEACHER TRAINING - BY GROUP

	GROUP						Total		GROUP(1+2)		Total	
	1		2		3		Count	COLUMN	9.00	Count	COLUMN	
	PERCENT		PERCENT		PERCENT		PERCENT		PERCENT		PERCENT	
	Count	COLUMN	Count	COLUMN	Count	COLUMN	Count	COLUMN	Count	COLUMN	Count	COLUMN
TEACHER TRAINING EXPERIENCE RECEIVED												
NONE	7	63.6%	8	61.5%	24	82.8%	39	73.6%	15	62.5%	15	62.5%
SECONDARY TEACOL			1	7.7%	1	3.4%	2	3.8%	1	4.2%	1	4.2%
ARMED FORCES TRAIN					1	3.4%	1	1.9%				
VARSITY TRAINING C	3	27.3%	1	7.7%			4	7.5%	4	16.7%	4	16.7%
OTHER TEACHER TRAIN	1	9.1%	3	23.1%	3	10.3%	7	13.2%	4	16.7%	4	16.7%
Total	11	100.0%	13	100.0%	29	100.0%	53	100.0%	24	100.0%	24	100.0%

(GROUP 1,2,3)
CHI-SQUARE D.F. SIGNIFICANCE
11.65 8 .167

(GROUP [1+2] V 3)
CHI-SQUARE D.F. SIGNIFICANCE
6.80 4 .146

TABLE D2
TOTAL UNIVERSITY TEACHING SERVICE - BY GROUP

	GROUP						Total	GROUP(1+2)		Total
	1	2	3	Count	COLUMN	PERCENT	9.00	Count	COLUMN	PERCENT
	Count	COLUMN	Count	COLUMN	Count	COLUMN	PERCENT	Count	COLUMN	PERCENT
LENGTH OF VARSITY TEACHING SERVICE										
0 - 1 YEARS	1	9.1%	1	7.7%	2	6.7%	4	7.4%	2	8.3%
1 - 2 YEARS	2	18.2%	1	7.7%	2	6.7%	5	9.3%	3	12.5%
3 - 5 YEARS	2	18.2%	1	7.7%	5	16.7%	8	14.8%	3	12.5%
6 - 10 YEARS	1	9.1%	5	38.5%	9	30.0%	15	27.8%	6	25.0%
11 - 15 YEARS	3	27.3%	3	23.1%	4	13.3%	10	18.5%	6	25.0%
OVER 15 YEARS	2	18.2%	2	15.4%	8	26.7%	12	22.2%	4	16.7%
Total	11	100.0%	13	100.0%	30	100.0%	54	100.0%	24	100.0%

(GROUP 1,2,3)			(GROUP [1+2] V 3)		
CHI-SQUARE	D.F.	SIGNIFICANCE	CHI-SQUARE	D.F.	SIGNIFICANCE
5.49	10	.856	2.39	5	.792

TABLE D3
TOTAL TEACHING SERVICE - BY GROUP

	GROUP						Total	GROUP(1+2)		Total
	1	2	3	Count	COLUMN	PERCENT	9.00	Count	COLUMN	PERCENT
	Count	COLUMN	Count	COLUMN	Count	COLUMN	PERCENT	Count	COLUMN	PERCENT
LENGTH OF TOTAL TEACHING SERVICE										
0 - 1 YEARS	1	9.1%			2	6.7%	3	5.6%	1	4.2%
1 - 2 YEARS	2	18.2%	1	7.7%	2	6.7%	5	9.3%	3	12.5%
3 - 5 YEARS	1	9.1%	1	7.7%	3	10.0%	5	9.3%	2	8.3%
6 - 10 YEARS	2	18.2%	5	38.5%	11	36.7%	18	33.3%	7	29.2%
11 - 15 YEARS	3	27.3%	4	30.8%	3	10.0%	10	18.5%	7	29.2%
OVER 15 YEARS	2	18.2%	2	15.4%	9	30.0%	13	24.1%	4	16.7%
Total	11	100.0%	13	100.0%	30	100.0%	54	100.0%	24	100.0%

(GROUP 1,2,3)			(GROUP [1+2] V 3)		
CHI-SQUARE	D.F.	SIGNIFICANCE	CHI-SQUARE	D.F.	SIGNIFICANCE
6.93	10	.731	4.53	5	.475

TABLE D4
SEX - BY GROUP

	GROUP						Total	GROUP(1+2)		Total		
	1	2	3	Count	COLUMN	PERCENT	9.00	Count	COLUMN	PERCENT		
	Count	COLUMN	Count	COLUMN	Count	COLUMN	Count	COLUMN	Count	COLUMN		
SEX												
MALE	11	100.0%	11	84.6%	28	93.3%	50	92.6%	22	91.7%	22	91.7%
FEMALE			2	15.4%	2	6.7%	4	7.4%	2	8.3%	2	8.3%
Total	11	100.0%	13	100.0%	30	100.0%	54	100.0%	24	100.0%	24	100.0%

(GROUP 1,2,3)			(GROUP [1+2] V 3)		
CHI-SQUARE	D.F.	SIGNIFICANCE	CHI-SQUARE	D.F.	SIGNIFICANCE
2.11	2	.348	.05	1	.816

TABLE D5
STATUS - BY GROUP

	GROUP						Total	GROUP(1+2)		Total		
	1	2	3	Count	COLUMN	PERCENT	9.00	Count	COLUMN	PERCENT		
	Count	COLUMN	Count	COLUMN	Count	COLUMN	Count	COLUMN	Count	COLUMN		
STATUS												
TUTOR			1	3.3%	1	1.9%						
DEMONSTRATOR		1	7.7%		1	1.9%	1	4.2%	1	4.2%		
JUNIOR LECTURER	2	18.2%	1	7.7%	2	6.7%	5	9.3%	3	12.5%	3	12.5%
LECTURER	3	27.3%	2	15.4%	5	16.7%	10	18.5%	5	20.8%	5	20.8%
SENIOR LECTURER	5	45.5%	4	30.8%	16	53.3%	25	46.3%	9	37.5%	9	37.5%
READER	1	9.1%	2	15.4%	5	16.7%	8	14.8%	3	12.5%	3	12.5%
PROFESSOR			3	23.1%	1	3.3%	4	7.4%	3	12.5%	3	12.5%
Total	11	100.0%	13	100.0%	30	100.0%	54	100.0%	24	100.0%	24	100.0%

(GROUP 1,2,3)			(GROUP [1+2] V 3)		
CHI-SQUARE	D.F.	SIGNIFICANCE	CHI-SQUARE	D.F.	SIGNIFICANCE
12.84	12	.380	5.05	6	.536

TABLE D6
AGE - BY GROUP

	GROUP						Total	GROUP(1+2)		Total		
	1	2	3	Count	COLUMN	9.00	Count	COLUMN				
				PERCENT	PERCENT		PERCENT	PERCENT				
AGE	Count	COLUMN	Count	COLUMN	Count	COLUMN	Count	COLUMN	Count	COLUMN		
UNDER 25	1	9.1%	1	7.7%	2	6.7%	4	7.4%	2	8.3%	2	8.3%
26 - 30	1	9.1%	1	7.7%	2	6.7%	4	7.4%	2	8.3%	2	8.3%
31 - 35	3	27.3%	3	23.1%	5	16.7%	11	20.4%	6	25.0%	6	25.0%
36 - 40	3	27.3%	3	23.1%	7	23.3%	13	24.1%	6	25.0%	6	25.0%
41 - 50	3	27.3%	4	30.8%	6	20.0%	13	24.1%	7	29.2%	7	29.2%
OVER 50			1	7.7%	8	26.7%	9	16.7%	1	4.2%	1	4.2%
Total	11	100.0%	13	100.0%	30	100.0%	54	100.0%	24	100.0%	24	100.0%

(GROUP 1,2,3)
CHI-SQUARE D.F. SIGNIFICANCE
5.45 10 .858

(GROUP [1+2] V 3)
CHI-SQUARE D.F. SIGNIFICANCE
5.08 5 .405

ALL TABLES

* p = < .05

** p = < .01

ANALYSES OF COVARIANCE

A repeated measures analysis of covariance as structured by Norusis (1985) was used to determine whether the effect of group involvement was significant with regard to the deviation of group means from the grand mean.

Despite group homogeneity on demographic variables, analysis of covariance was used to control for any initial residual differences between groups. By using covariate analysis the test for group effect is based on a constant adjusted for the covariate, so that differences between the groups on overall criterion variables are eliminated. The test indicates whether the independent variable (type of staff development) adds significantly to the proportion of variance accounted for by the initial pretest scores. In effect this indicates whether information about staff development modes adds significantly to the proportion of variance accounted for by initial measures of attitudes, knowledge and behaviour.

Analysis of covariance was used to examine relationships between staff development mode and changes in knowledge, attitudes and behaviour. This procedure was performed separately on each criterion measure contributing to the generic variables of Attitude, Knowledge and Behaviour. Additional analyses of combinations of factors comprising Orienting, Instruction and Involvement aspects of Behaviour were also performed. Separate analyses were performed to determine:

- A. Overall variance between the three groups, (IDI, ODI, LI);
- B. Variance between the combined Involved groups and the Low Involvement group, (IDI+ODI) v LI; and,
- C. Variance relating to Inner-directed versus Other-directed modes of staff development, (IDI v ODI).

In order to more clearly identify any differences relating to Inner-directed and Other-directed modes of staff development, further analyses of covariance for each mode versus the Low Involvement mode

were performed.

Tests for homogeneity of regression coefficients were performed to ensure that the use of the common regression coefficient was appropriate (Kerlinger F.N. and Pedhazur E.J. 1973, pp.267-268).

ATTITUDES by Mode.

A. Groups 1,2,3. (IDI, ODI, LI).

Results of the analysis of covariance indicate significant interaction effects between staff development mode and change scores on attitudes. Interaction effects were found to be significant for changes in:

Overall Attitudes to Teaching,
Attitudes to Relevance,
Attitudes to Student Involvement,
Attitudes toward Inner-Directedness,
Attitudes toward Motivating Students.

Interaction effects were not shown to be significant for changes in Attitudes to Learners, changes in Attitudes to Objectives nor to changes in Attitudes to Personal Accountability.

Tests for homogeneity of regression coefficients proved positive for all attitudinal variables other than Attitudes to Relevance, therefore the mean differences for this variable are not considered to be statistically significant.

Pre- versus post- measure differences were reliable and significant for:

Overall Attitude Change, (F=10.57, 2/57 df., p.<.001);
Attitudes to Student Involvement, (F= 5.51, 2/57 dg., p.<.01);
Attitudes to Inner-Directedness, (F= 4.09, 2/57 df., p.<.03);
Attitudes to Motivating Students, (F= 5.27, 2/57 df., p.<.01).

Observed means, adjusted difference means and change means expressed as percentages are presented in Tables 1-8.

TABLE 1
 'Analysis of Covariance'
 OVERALL ATTITUDE CHANGE
 (Pre Versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	10.27	17.45	7.18	1.87	7.91	77%
2 (Other-Directed)	6.35	12.24	5.88	1.06	5.45	85%
3 (Low Involvement)	6.78	8.52	1.72	.65	1.42	21%
Entire population	7.29	11.16				

n.

GROUP 1,2,3	61		F= 10.57	p.= .000**
GROUP (1+2) v 3	28;33	Est.Diff.= -5.25	T= -4.58	p.= .000**
GROUP 1 v 2	11;17	Est.Diff.= -2.45	T= -1.38	p.= .171

TABLE 2
 'Analysis of Covariance'
 CHANGE IN ATTITUDES TO LEARNERS
 (Pre Versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	1.73	2.64	.91	.43	1.08	62%
2 (Other-Directed)	.76	1.76	1.00	.31	.87	114%
3 (Low Involvement)	1.03	1.42	.39	.26	.35	34%
Entire population	1.08	1.74				

n.

GROUP 1,2,3	61		F= 1.45	p.= .243
GROUP (1+2) v 3	28;33	Est.Diff.= -1.60	T= -1.70	p.= .094
GROUP 1 v 2	11;17	Est.Diff.= -.20	T= -.36	p.= .722

TABLE 3
 'Analysis of Covariance'
 CHANGE IN ATTITUDES TO OBJECTIVES
 (Pre Versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	.36	.82	.45	.24	1.50	139%
2 (Other-Directed)	.12	.29	.17	.17	.14	116%
3 (Low Involvement)	.21	.24	.03	.10	.02	9%
Entire population	.21	.36				

n.

GROUP 1,2,3	61		F= 2.23	p.= .117
GROUP (1+2) v 3	28;33	Est.Diff.= -.8	T= -1.75	p.= .085
GROUP 1 v 2	11;17	Est.Diff.= -1.36	T= -1.44	p.= .154

TABLE 4
 'Analysis of Covariance'
 CHANGE IN ATTITUDES TO RELEVANCE
 (Pre Versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	1.63	2.73	1.09	.28	1.22	75%
2 (Other-Directed)	1.05	2.06	1.00	.38	.94	89%
3 (Low Involvement)	1.00	1.36	.36	.17	.29	29%
Entire population	1.13	1.80				

n.

(X= Rejected on test for homogeneity)

GROUP 1,2,3	61	F=3.61		p.= .033*X
GROUP (1+2) v 3	28;33	Est.Diff.= -.79	T= -2.68	p.= .010**
GROUP 1 v 2	11;17	Est.Diff.= -.27	T= -.62	p.= .537

TABLE 5
 'Analysis of Covariance'
 CHANGE IN ATTITUDES TO STUDENT INVOLVEMENT
 (Pre Versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	1.73	3.73	2.00	.55	2.10	121%
2 (Other-Directed)	1.18	2.35	1.17	.28	1.07	91%
3 (Low Involvement)	1.42	1.81	.39	.28	.39	27%
Entire population	1.41	2.31				

n.

GROUP 1,2,3	61			F= 5.51	p.= .006**
GROUP (1+2) v 3	28;33	Est.Diff.= -1.20		T= -3.07	p.= .003**
GROUP 1 v 2	11;17	Est.Diff.= -1.03		T= -1.74	p.= .088

TABLE 6
 'Analysis of Covariance'
 CHANGE IN ATTITUDES TO PERSONAL ACCOUNTABILITY
 (Pre Versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	2.73	3.36	.63	.75	.92	34%
2 (Other-Directed)	2.06	3.29	1.23	.52	1.19	58%
3 (Low Involvement)	1.63	2.27	.63	.25	.39	24%
Entire population	1.95	2.75				

n.

GROUP 1,2,3	61			F= 1.26	p.= .291
GROUP (1+2) v 3	28;33	Est.Diff.= -.67		T= -1.43	p.= .157
GROUP 1 v 2	11;17	Est.Diff.= .27		T= .40	p.= .690

TABLE 7

'Analysis of Covariance'

CHANGE IN ATTITUDES TO INNER DIRECTEDNESS

(Pre Versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	1.54	2.45	.91	.40	1.05	68%
2 (Other-Directed)	1.00	1.65	.65	.27	.56	56%
3 (Low Involvement)	1.06	.85	-.21	.20	-.27	-25%
Entire population	1.13	1.36				

n.

GROUP 1,2,3	61		F= 4.09	p.= .022*
GROUP (1+2) v 3	28;33	Est.Diff.= -1.07	T= -2.83	p.= .006**
GROUP 1 v 2	11;17	Est.Diff.= -.49	T= -.85	p.= .397

TABLE 8

'Analysis of Covariance'

CHANGE IN ATTITUDES TO MOTIVATING STUDENTS

(Pre Versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	.55	1.73	1.18	.51	1.29	234%
2 (Other-Directed)	.18	.82	.65	.46	.52	288%
3 (Low Involvement)	.42	.55	.12	.21	.15	35%
Entire population	.37	.84				

n.

GROUP 1,2,3	61		F= 5.27	p.= .008**
GROUP (1+2) v 3	28;33	Est.Diff.= -.75	T= -2.86	p.= .006**
GROUP 1 v 2	11;17	Est.Diff.= -.77	T= -1.95	p.= .056

B. Groups (1+2) v 3. (Combined IDI and ODI versus LI).

Results of the analysis of covariance indicate significant relationships between the combined Inner-directed and Other-directed modes versus the Low Involvement mode. After application of tests for homogeneity, interaction effects were found to be significant for changes in:

Overall Attitudes, (T=-4.58, 1/57 df., p <.001);

Attitudes to Student Involvement, (T=-3.07, 1/57 df., p.<.005);

Attitudes to Inner-Directedness, (T=-2.83, 1/57 df., p.<.01);

Attitudes to Motivating Students, (T=-2.86, 1/57 df., p.<.01).

Observed means, adjusted difference means and change means expressed as percentages are presented in Tables 1-8.

C. Group 1 v 2. (Inner-directed versus Other-directed)

No significant interaction effects were found for any Attitude variables, (See Tables 1-8); however, an examination of estimated differences means for group 1 v 2 shows that group 1 (IDI), obtained greater change scores than group 2 (ODI), for 7 out of the 8 variables in the Attitude category.

Analysis of covariance was then calculated separately for each group in comparison with group 3 (LI), (See D below).

D. Group 1 v 3. (Inner-directed versus Low Involvement)

After tests for homogeneity of regression coefficients, analyses of covariance indicate significant effects for pre- versus post- means in:

Overall Attitudes, (F=16.24, 1/47 df., p.<.001);

Attitudes to Relevance, (F=5.27, 1/47 df., p.<.03);

Attitudes to Student Involvement, (F=9.44, 1/41 df., p.<.005);

Attitudes to Objectives, (F=4.28, 1/41 df., p.<.05);

Attitudes to Inner-Directedness, (F=9.65, 1/41 df., p.<.005);

Attitudes to Motivating Students, (F=12.79, 1/41 df., p.<.001).

E. Group 2 v 3. (Other-Directed versus Low Involvement)

Analyses of covariance indicate no significant interaction effects for mode of staff development with any Attitude variable with the exception of Overall Attitude Change, (F=12.03, 1/47 df., p<.001).

Estimated differences, F scores and significance are presented in Tables 9-16.

TABLE 9

OVERALL ATTITUDE CHANGE				
GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	11;33	-6.49	16.24	.000**
2V3	17;33	-4.03	12.02	.001**

TABLE 10
CHANGE IN ATTITUDES TO LEARNERS

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	11;33	-.73	2.09	.155
2V3	17;33	-.52	1.52	.223

TABLE 11
CHANGE IN ATTITUDES TO OBJECTIVES

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	11;33	-1.48	4.28	.045*
2V3	17;33	-.12	.22	.640

TABLE 12
CHANGE IN ATTITUDES TO RELEVANCE

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	11;33	-.93	5.27	.027*
2V3	17;33	-.65	3.94	.053

TABLE 13
CHANGE IN ATTITUDES TO STUDENT INVOLVEMENT

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	11;33	-1.71	9.44	.004**
2V3	17;33	-.68	2.61	.113

TABLE 14

CHANGE IN ATTITUDES TO PERSONAL ACCOUNTABILITY

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	11;33	.27	.42	.521
2V3	17;33	-.8	2.59	.114

TABLE 15

CHANGE IN ATTITUDES TO INNER DIRECTEDNESS

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	11;33	-1.32	9.65	.003**
2V3	17;33	-.83	3.75	.059

TABLE 16

CHANGE IN ATTITUDES TO MOTIVATING STUDENTS

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	11;33	-1.04	12.79	.001**
2V3	17;33	-.37	1.62	.209

Summary.

These results indicate that effects of mode were statistically significant for attitude change. Significant interaction effects are indicated for the Inner-directed staff development mode versus Low Involvement mode for 7 out of 8 attitude variables. Data also indicate significant differences between the attitude changes of staff with moderate to high involvement (groups 1 and 2), when compared with staff with low involvement (group 3).

As predicted, statistically significant effects were found for attitude changes of staff involved in Inner-directed when compared with

Low Involvement staff development experiences. Conversely there were no significant effects indicated for the Other-directed mode when compared with the Low Involvement mode.

These findings lead to acceptance of hypotheses 2.1 and 2.2, namely that: 2.1 "Inner-directed staff development contributes significantly to change in attitudes to instructional behaviour," and that;

2.2 "Other-directed staff development does not contribute significantly to change in attitudes to instructional behaviour."

KNOWLEDGE by Mode

Groups 1,2,3. (IDI, ODI, LI)

Results of analyses of covariance indicate no statistically significant interaction effects between mode of staff development and change scores on Knowledge. An examination of change expressed as percentages shows a high degree of stability between pre- and post-means for all Knowledge variables, with no mean change greater than 9%.

Groups (1+2) v 3. ((IDI+ODI) versus LI)

A significant interaction effect was shown between mode (combined Inner-directed and Other-directed, versus Low Involvement) and changes in Knowledge of Objectives (Table 20), ($T=2.15$, 1/47 df., $p<.05$).

No other significant interaction effects were displayed for the other 5 Knowledge variables.

Group 1 v 2. (IDI versus ODI)

No significant interaction effect was indicated for these modes in relation to any Knowledge variable. Observed means, adjusted difference means and change means expressed as percentages are presented in Tables 17-22.

TABLE 17

'Analysis of Covariance'

OVERALL KNOWLEDGE OF TEACHING

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	91.33	87.11	-4.43	1.9	-4.27	-5%
2 (Other-Directed)	91.91	88.33	-.89	2.9	-.59	0.6%
3 (Low Involvement)	84.71	88.64	2.66	1.9	2.21	2.3%
Entire population	88.09	88.26				

n.

GROUP 1,2,3	(34)		F= 1.75	p.= .192
GROUP (1+2) V 3	(27;18)	Est.Diff.= 4.65	T= 1.68	p.= .103
GROUP 1 V 2	(7;9)	Est.Diff.= 3.68	T= .94	p.= .353

TABLE 18

'Analysis of Covariance'

KNOWLEDGE OF LEARNERS NEEDS

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	14.50	13.00	-1.11	1.3	-1.05	-7%
2 (Other-Directed)	15.36	14.60	-.27	.7	.19	1%
3 (Low Involvement)	12.57	13.93	1.44	.76	.92	7%
Entire population	13.59	13.94				

n.

GROUP 1,2,3	(47)		F= 1.57	p.= .219
GROUP (1+2) V 3	(20;27)	Est.Diff.= 1.34	T= 1.52	p.= .136
GROUP 1 V 2	(9;11)	Est.Diff.= 1.24	T= .97	p.= .338

TABLE 19
 'Analysis of Covariance'

KNOWLEDGE OF RELEVANCE

(Pre versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	16.80	16.80	.22	1.28	.22	1%
2 (Other-Directed)	17.50	16.93	-.45	.80	-.62	-4%
3 (Low Involvement)	15.44	16.36	.85	.44	.68	4%
Entire population	16.22	16.59				

n.

GROUP 1,2,3	(46)		F= .13	p.= .879
GROUP (1+2) V 3	(20;26)	Est.Diff.= .26	T= .35	p.= .723
GROUP 1 V 2	(9;11)	Est.Diff.= .39	T= .37	p.= .709

TABLE 20

'Analysis of Covariance'

KNOWLEDGE OF OBJECTIVES

(Pre versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	16.73	15.00	-1.70	1.80	-1.29	-8%
2 (Other-Directed)	14.67	13.86	-.92	.98	-1.36	-9%
3 (Low Involvement)	15.80	16.03	.68	.80	.71	5%
Entire population	15.73	15.25				

n.

GROUP 1,2,3	(47)		F= 2.32	p.= .110
GROUP (1+2) V 3	(22;25)	Est.Diff.= 2.04	T= 2.15	p.= .037*
GROUP 1 V 2	(10;11)	Est.Diff.= -.07	T= -.05	p.= .959

TABLE 21

'Analysis of Covariance'

KNOWLEDGE OF STUDENT INVOLVEMENT

(Pre versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	22.44	22.00	-.28	.87	-.30	1%
2 (Other-Directed)	23.18	23.69	1.55	.78	1.93	8%
3 (Low Involvement)	21.00	21.65	.14	.81	-.21	1%
Entire population	21.82	22.27				

n.

GROUP 1,2,3	(37)		F= 1.98	p.= .153
GROUP (1+2) V 3	(16;21)	Est.Diff.= -1.02	T= -1.08	p.= .284
GROUP 1 V 2	(7;9)	Est.Diff.= 2.22	T= 1.59	p.= .122

TABLE 22

'Analysis of Covariance'

KNOWLEDGE OF MOTIVATION

(Pre versus Post Comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
1 (Inner-Directed)	18.90	19.00	.22	1.55	-.12	-1%
2 (Other-Directed)	21.18	19.78	-.36	1.05	.04	0%
3 (Low Involvement)	19.76	19.90	.25	.66	.18	1%
Entire population	19.91	19.69				

n.

GROUP 1,2,3	(44)		F= .04	p.= .964
GROUP (1+2) V 3	(20;24)	Est.Diff.= .22	T= .25	p.= .803
GROUP 1 V 2	(9;11)	Est.Diff.= .15	T= .11	p.= .908

Groups (1 v 3) and Groups (2 v 3)

No statistical significance was shown for either of these

interactions between mode of staff development and change in Knowledge. Examination of the adjusted difference means indicated that for 5 of 6 Knowledge variables the Inner-directed mode resulted in decreased means and conversely the Low Involvement mode resulted in increased means, (Tables 17-22). Estimated differences, F scores together with estimates of statistical significance are presented in Tables 23-28.

TABLE 23
KNOWLEDGE OF TEACHING

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	7;18	-.71	4.16	.053
2V3	9;18	-.74	.63	.434

TABLE 24
KNOWLEDGE OF LEARNERS' NEEDS

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	7;18	1.97	2.68	.111
2V3	9;18	.73	.68	.414

TABLE 25
KNOWLEDGE OF RELEVANCE

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	7;18	.36	.38	.543
2V3	9;18	1.3	.03	.864

TABLE 26
KNOWLEDGE OF OBJECTIVES

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	7;18	2.0	2.34	.136
2V3	9;18	2.07	3.29	.078

TABLE 27

KNOWLEDGE OF STUDENT INVOLVEMENT

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	7;18	.09	.01	.933
2V3	9;18	-2.14	3.99	.056

TABLE 28

KNOWLEDGE OF MOTIVATION

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	7;18	.3	.06	.813
2V3	9;18	.14	.09	.758

BEHAVIOUR by ModeGroups 1,2,3. (IDI, ODI, LI).

A significant interaction effect was found between staff development modes in relation to Use of Multi Sensory Resources (Table 40), ($F=4.68$, 2/15 df., $p.<.03$). This effect is reflected in the linearity of percentage means of the three groups ($-26\% < -5\% < 5\%$). No other significant effects were found between mode and Behaviour variables.

Group (1+2) v 3. ([IDI+ODI] versus LI)

A significant interaction effect was found between mode, Inner-directed and Other-directed combined, versus Low involvement, and Use of Multi Sensory Resources (Table 40, $T=2.54$, 1/15 df., $p=.022$). The data indicates an increase for the Low Involvement group and a considerable decrease for the Inner-directed group.

No other significant interaction effects were found between modes and Behaviour variables for these two groups.

Group 1 v 2. (IDI versus ODI)

Results of analyses of covariance for interactions between modes of staff development in relation to all Behaviour variables are displayed in Tables 29-40.

TABLE 29

'Analysis of Covariance'

OVERALL CHANGE IN TEACHING BEHAVIOUR

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	79.04	72.68	-6.36	4.75	-5.20	7%
2 (Other-Directed)	74.48	77.30	2.82	3.20	2.14	3%
3 (Low Involvement)	74.98	71.92	-3.06	4.50	-3.54	5%
Entire population	75.92	73.53				

n.

GROUP 1,2,3	(19)		F=	.58	p.=	.568	
GROUP (1+2) V 3	(10;9)	Est.Diff.=	-2.01	T=	-.38	p.=	.707
GROUP 1 V 2	(5;5)	Est.Diff.=	7.34	T=	1.00	p.=	.331

TABLE 30

'Analysis of Covariance'

FOCUSSING STUDENT ATTENTION

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	22.32	21.26	-1.06	8.52	-2.37	-1%
2 (Other-Directed)	28.74	23.66	-5.08	4.70	-3.40	-12%
3 (Low Involvement)	24.37	26.21	1.84	1.96	1.48	6%
Entire population	24.98	24.23				

n.

GROUP 1,2,3	(19)		F=	.41	p.=	.669	
GROUP (1+2) V 3	(10;9)	Est.Diff.=	4.37	T=	.89	p.=	.383
GROUP 1 V 2	(5;5)	Est.Diff.=	-1.03	T=	-.15	p.=	.883

TABLE 31
 'Analysis of Covariance'
 DEGREE OF STUDENT PARTICIPATION
 (Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	6.16	4.66	-1.50	1.84	-1.99	-33%
2 (Other-Directed)	10.48	15.58	5.10	4.04	5.96	57%
3 (Low Involvement)	6.57	2.07	-4.49	3.49	-4.86	-74%
Entire population	7.49	6.31				

n.

GROUP 1,2,3	(19)		F= 2.56	p.= .110
GROUP (1+2) V 3	(10;9)	Est.Diff.= -6.84	T= -1.75	p.= .101
GROUP 1 V 2	(5;5)	Est.Diff.= 7.96	T= 1.46	p.= .164

TABLE 32
 'Analysis of Covariance'
 REINFORCEMENT OF LEARNERS
 (Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	.12	.30	.18	.26	.19	158%
2 (Other-Directed)	.14	.14	.00	1.36	.04	28%
3 (Low Involvement)	.07	.01	-.06	.02	-.11	-157%
Entire population	.10	.12				

n.

GROUP 1,2,3	(19)		F= 1.47	p.= .261
GROUP (1+2) V 3	(10;9)	Est.Diff.= -.23	T= -1.51	p.= .151
GROUP 1 V 2	(5;5)	Est.Diff.= -.15	T= -.78	p.= .449

TABLE 33
'Analysis of Covariance'

FEEDBACK TO STUDENTS

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	6.98	11.68	4.70	9.15	6.72	96%
2 (Other-Directed)	3.54	3.42	-.12	2.40	-1.22	-34%
3 (Low Involvement)	3.76	2.34	-1.41	.76	-2.32	-62%
Entire population	4.55	5.08				

n.

GROUP 1,2,3	(19)		F=	1.20	p.=	.327	
GROUP (1+2) V 3	(10;9)	Est.Diff.=	-5.07	T=	-1.07	p.=	.301
GROUP 1 V 2	(5;5)	Est.Diff.=	-7.95	T=	-1.18	p.=	.255

TABLE 34

'Analysis of Covariance'

PROVISION OF MULTIPLE EXAMPLES OF CONCEPTS

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	36.62	29.08	-7.54	7.20	-7.06	-19%
2 (Other-Directed)	28.04	28.80	.76	3.85	-.19	-1%
3 (Low Involvement)	36.61	39.00	2.39	3.33	2.86	8%
Entire population	34.36	33.70				

n.

GROUP 1,2,3	(19)		F=	1.19	p.=	.329	
GROUP (1+2) V 3	(10;9)	Est.Diff.=	6.49	T=	1.21	p.=	.244
GROUP 1 V 2	(5;5)	Est.Diff.=	6.86	T=	.92	p.=	.373

TABLE 35

'Analysis of Covariance'

USE OF NEUTRAL INFORMING

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	20.92	27.22	6.30	4.74	5.15	25%
2 (Other-Directed)	25.44	22.66	-2.78	3.22	-2.11	-8%
3 (Low Involvement)	24.94	28.00	3.06	1.36	3.53	14%
Entire population	24.01	26.39				

n.

GROUP 1,2,3	(19)		F=	.57	p.=	.576	
GROUP (1+2) V 3	(10;9)	Est.Diff.=	2.00	T=	.38	p.=	.708
GROUP 1 V 2	(5;5)	Est.Diff.=	-7.26	T=	-.99	p.=	.337

TABLE 36

'Analysis of Covariance'

USE OF "OPTIMAL AROUSAL" STRATEGIES

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	3.34	4.32	.98	1.26	.88	26%
2 (Other-Directed)	3.54	5.48	1.94	2.27	1.98	65%
3 (Low Involvement)	3.57	2.20	-1.37	1.07	-1.31	-37%
Entire population	3.50	3.62				

n.

GROUP 1,2,3	(19)		F=	1.83	p.=	.194	
GROUP (1+2) V 3	(10;9)	Est.Diff.=	-2.73	T=	-1.84	p.=	.086
GROUP 1 V 2	(5;5)	Est.Diff.=	1.10	T=	.54	p.=	.599

TABLE 37

'Analysis of Covariance'

ENSURING RELEVANCE UNDERSTOOD

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	.76	.18	-.58	.83	-.05	109%
2 (Other-Directed)	.00	.00	.00	.00	-.28	00%
3 (Low Involvement)	.03	.07	.04	.07	-.20	233%
Entire population	.22	.08				

n.

GROUP 1,2,3	(19)		F= 1.03	p.= .379
GROUP (1+2) V 3	(10;9)	Est.Diff.= -.03	T= -.29	p.= .769
GROUP 1 V 2	(5;5)	Est.Diff.= -.22	T= -1.42	p.= .175

TABLE 38

'Analysis of Covariance'

ENSURING STUDENT UNDERSTANDING OF OBJECTIVES

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	2.74	1.00	-1.74	2.9	.27	10%
2 (Other-Directed)	.00	.22	.22	.22	-.78	--
3 (Low Involvement)	.00	.00	.00	.00	--	--
Entire population	.72	.32				

n.

GROUP 1,2,3	(19)		F= 1.78	p.= .202
GROUP (1+2) V 3	(10;9)	Est.Diff.= -.74	T= -1.40	p.= .181
GROUP 1 V 2	(5;5)	Est.Diff.= -1.05	T= -1.39	p.= .185

TABLE 39

'Analysis of Covariance'

MAINTAINING A POSITIVE LEARNING CLIMATE

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	.00	.20	.20	.16	.19	--
2 (Other-Directed)	.00	.00	.00	.00	.01	--
3 (Low Involvement)	.02	.00	-.02	.02	.01	--
Entire population	.01	.05				

n.

GROUP 1,2,3	(19)		F= 2.26	p.= .139
GROUP (1+2) V 3	(10;9)	Est.Diff.= -.10	T= -1.17	p.= .257
GROUP 1 V 2	(5;5)	Est.Diff.= -.20	T= -1.76	p.= .097

TABLE 40

'Analysis of Covariance'

USE OF MULTI-SENSORY RESOURCES

(Pre versus Post comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent change
GROUP						
1 (Inner-Directed)	.97	.66	-.31	.12	-.26	-26%
2 (Other-Directed)	.86	.74	-.12	.08	-.04	-5%
3 (Low Involvement)	1.64	1.87	.23	.23	.09	5%
Entire population	1.26	1.26				

n.

GROUP 1,2,3	(19)		F= 4.68	p.= .026*
GROUP (1+2) V 3	(10;9)	Est.Diff.= .25	T= 2.54	p.= .022*
GROUP 1 V 2	(5;5)	Est.Diff.= .22	T= 1.69	p.= .112

Results of the analyses of covariance indicate no significant interaction effects for mode with the composite variables of Orienting, Instruction or Involvement of the Behaviour category, (Tables 41-43).

TABLE 41

'Analysis of Covariance'

TOTAL ORIENTING BEHAVIOUR

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent Change
GROUP						
1 (Inner-Directed)	6.84	5.70	-1.14	3.13	.61	19%
2 (Other-Directed)	3.54	5.70	2.16	2.24	1.25	35%
3 (Low Involvement)	3.62	2.28	-1.34	1.07	-2.18	-60%
Entire population	4.44	4.08				

n.

GROUP 1,2,3	(19)		F= 1.78	p.= .201
GROUP (1+2) V 3	(10;9)	Est.Diff.= -3.12	T= -1.85	p.= .084
GROUP 1 V 2	(5;5)	Est.Diff.= .64	T= .27	p.= .792

TABLE 42

'Analysis of Covariance'

TOTAL INSTRUCTIONAL BEHAVIOUR

(Pre versus Post Comparisons)

	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent change
GROUP						
1 (Inner-Directed)	43.72	41.06	-2.66	12.65	-.84	-2%
2 (Other-Directed)	31.72	32.36	.64	4.76	-1.82	-6%
3 (Low Involvement)	40.43	41.35	.92	3.09	1.56	4%
Entire population	39.00	38.91				

n.

GROUP 1,2,3	(19)		F= .08	p.= .923
GROUP (1+2) V 3	(10;9)	Est.Diff.= 2.89	T= .39	p.= .700
GROUP 1 V 2	(5;5)	Est.Diff.= -.97	T= -.09	p.= .928

TABLE 43

'Analysis of Covariance'

TOTAL "INVOLVING STUDENTS" BEHAVIOUR

(Pre versus Post comparisons)

GROUP	PRE Mean	POST Mean	Obs.Diff Mean	Std.Err. Obs.Diff	Adj.Diff Mean	Percent change
1 (Inner-Directed)	29.45	26.57	-2.87	8.7	-5.93	-21%
2 (Other-Directed)	40.08	39.98	-.10	6.2	3.93	10%
3 (Low Involvement)	32.58	30.16	-2.41	3.8	-3.38	-10%
Entire population	33.73	31.80				

n.

GROUP 1,2,3	(19)		F= .97	p.= .400
GROUP (1+2) V 3	(10;9)	Est.Diff.= -2.38	T= -.46	p.= .652
GROUP 1 V 2	(5;5)	Est.Diff.= 9.86	T= 1.32	p.= .204

Group 1 v 3, and Group 2 v 3. (IDI versus LI), and (ODI versus LI).

Results of the analyses of covariance for Group 1 versus 3, and for Group 2 versus 3 are displayed in Tables 44-58.

Use of Multi Sensory Resources by group 1 v 3 was the only Behaviour variable found to have a significant interaction effect of mode. See Table 55. (F=7.58, 1/11 df., p.<.02). The Group 1 mean for time spent in the use of multi sensory resources decreased by 26% while the Group 3 mean increased by 5%. No other significant interaction effects were found between mode of staff development and Behaviour variables for either sets of groups. These findings lead to rejection of hypotheses 1.1 and 2.3., namely;

(1.1) "Inner-directed staff development is related to significant change in instructional behaviour."

(2.3) "Changes in attitude contribute significantly to changes in instructional behaviour."

TABLE 44

OVERALL CHANGE IN TEACHING BEHAVIOUR.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	2.66	.023	.882
2V3	5;9	-5.68	.26	.331

TABLE 45

FOCUSSING STUDENT ATTENTION

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	.89	.47	.507
2V3	5;9	4.88	1.83	.203

TABLE 46

DEGREE OF STUDENT PARTICIPATION

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	-2.87	1.51	.245
2V3	5;9	-10.82	3.94	.073

TABLE 47

REINFORCEMENT OF LEARNERS.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	-.3	2.22	.164
2V3	5;9	-.15	3.19	.101

TABLE 48

FEEDBACK TO STUDENTS.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	-9.04	1.81	.205
2V3	5;9	-1.1	.399	.540

TABLE 49

PROVISION OF MULTIPLE EXAMPLES OF CONCEPTS

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	9.92	2.04	.180
2V3	5;9	3.15	.13	.722

TABLE 50

USE OF NEUTRAL INFORMING

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	-1.62	.06	.811
2V3	5;9	5.64	.89	.366

TABLE 51

USE OF "OPTIMAL AROUSAL" STRATEGIES.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	-2.19	3.16	.103
2V3	5;9	-3.29	2.84	.120

TABLE 52

ENSURING RELEVANCE UNDERSTOOD.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	-.15	.787	.394
2V3	5;9	.08	1.13	.310

TABLE 53

ENSURING STUDENT UNDERSTANDING OF OBJECTIVES.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	.27	2.7	.129
2V3	5;9	-.78	1.93	.190

TABLE 54

MAINTAINING A POSITIVE LEARNING CLIMATE.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	.18	2.82	.121
2V3	5;9	.18	-	-

TABLE 55

USE OF MULTI-SENSORY RESOURCES.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	.35	7.58	.019*
2V3	5;9	.13	1.79	.208

TABLE 56

TOTAL ORIENTING BEHAVIOUR.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	-2.79	3.15	.104
2V3	5;9	-3.43	3.14	.104

TABLE 57

TOTAL INSTRUCTIONAL BEHAVIOUR.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	2.4	.05	.830
2V3	5;9	3.38	.12	.736

TABLE 58

TOTAL "INVOLVING STUDENTS" BEHAVIOUR.

GROUP	n.	ESTIMATED DIFFERENCE	F	p.
1V3	5;9	2.55	.15	.709
2V3	5;9	-7.31	1.61	.230

Table 59 presents means of time spent on 4 generic categories of teacher activity, derived from 10 sub variables of teaching behaviour. Raw scores were derived by totalling 5 second segments of each teaching behaviour during the duration of each session. These averaged approximately fifty minutes. Raw scores are expressed as percentages for pre, post, and overall measures of teaching behaviour. (Discrepancies from 100% are due to rounding of percentages to 2 decimal places.)

Results indicate that just over 4% of teacher time was spent on "Orienting" students to subject content by ensuring they understood

objectives, perceived relevance of subject matter, were aroused and motivated or were exposed to a positive learning climate.

Almost 40% of teaching time was devoted to the core "Instruction" activities of maximizing learning through provision of multiple examples of concepts and principles, giving feedback to students and reinforcing their learning behaviour. An additional aspect of "Instruction", but one which may or may not affect learning is "Neutral Informing". This occurs when information is provided without student participation other than apparent attending. It also includes organizational and neutral sociation statements of teachers. "Neutral Informing" occupied a mean 25% of teacher time.

A little over 30% of teacher time was devoted to behaviour designed to involve students. This included focussing student attention and activity toward desired learning outcomes and involved any one, or a combination, of physical, verbal and intellectual behaviours. It often includes active learner interaction with peers, teachers or other learning resources.

In total, major emphases were on the provision of neutral or explanatory information. This occupied almost 60% of teacher time with a further 25% devoted to the focussing of student attention.

Teaching behaviours directed toward student understanding of objectives or the relevance of subject matter, maintaining a positive learning climate and reinforcing student learning activities totalled less than 1% of teaching time, (.79 of one percent).

Data presented in Tables 29-58 indicates no significant differences between groups, for percentage of time spent on specific teaching behaviours.

TABLE 59

MEAN PERCENTAGES OF TEACHING TIME FOR EACH BEHAVIOUR CATEGORY

	PRE	POST	PRE+POST **	
Ensures students understand objectives	.72	.32	.5	} TOTAL ORIENTING BEHAVIOUR 4.24%
Ensures students perceive relevance	.22	.08	.15	
Use of "optimal arousal" strategies	3.5	3.62	3.56	
Maintains a positive learning climate	.01	.05	.03	
Provides feedback to students	4.55	5.08	4.86	} TOTAL INSTRUCTING BEHAVIOUR 39.00%
Reinforces student learning behaviours	.1	.12	.11	
Provides multiple examples	34.36	33.70	34.03	} TOTAL STUDENT INVOLVEMENT BEHAVIOUR 31.5%
Allows student participation	7.49	6.31	6.9	
Focusses student attention	24.98	24.23	24.6	
Provides neutral information	24.01	26.39	25.2	} TOTAL NEUTRAL BEHAVIOUR 25.2%
	99.94%	99.90%	99.94%	

** Figures in this column are derived by adding all scores for both pre and post measures and calculating the mean.

SUMMARY

ATTITUDES

In summarizing these data, statistics indicate:

1. As applied in this study 'Traditional Staff Development' is related to significant change in overall attitudes of staff to teaching.

- a. Overall change in attitudes is mainly the result of change in attitudes to 'student involvement', to 'student motivation' and to 'inner-directedness'.

- b. Overall change in attitudes reflects statistically significant changes within the combined Inner-directed and Other-directed groups. That is to say, groups that participated in some direct form of staff development show significant attitude changes in the sub categories of 'student involvement', 'motivation of students' and 'inner-directedness'. The Other-directed group also showed significant change in attitudes to 'relevance of subject matter'.

- c. The Low Involvement group showed no significant changes in attitudes. However, results expressed as percentages indicate only one negative change, that being in attitude to inner-directedness. All other sub categories showed positive change. With the exception of 'attitudes to objectives' at +9%, increases ranged from 24% to 35%.

- d. Examination of estimated difference scores (Tables 1-8), indicate that the Inner-directed group made greater changes in all sub categories of attitudes than the Other-directed group, (excepting only 'personal accountability', Table 6). This result is most clearly seen in Tables 9-16, which allow a comparison of Inner-directed group changes with Other-directed group changes both in relation to the Low Involvement group. Both the former groups made statistically significant overall attitude changes in comparison with the Low Involvement group. However, the Inner-directed changes were

significantly different statistically (on the 6 sub categories of 'attitudes to objectives', 'relevance', student involvement', 'student motivation' and 'inner directedness'), from those of the Low Involvement group, while the Other-directed group differences were not significant on any of these sub categories in relation to the Low Involvement group.

KNOWLEDGE

2. Traditional staff development, as applied in this study is not related to any significant change in overall knowledge concerning tertiary teaching.

a. Mode of staff development was not related to any significant changes in knowledge of tertiary teaching except for combined Inner-directed and Other-directed groups in 'knowledge of objectives'. This combined group showed a negative change of 9% whereas the Low Involvement group gained 5% (Tables 18-22).

b. Tables 23-28 allow a comparison of the results of Inner-directed and Other-directed groups, both in relation to the Low Involvement group. Results indicate no statistically significant differences. However, a marked negative change in 'overall knowledge' in comparison with the Low Involvement group is shown for the Inner-directed group, and a similar negative change in 'student involvement' is shown for the Other-directed group.

BEHAVIOUR

3. Traditional staff development was not shown to be related to significant change in overall teaching behaviour (Table 29).

a. 'Use of multi-sensory resources' showed a statistically significant interaction effect between modes of staff development. A significant decrease in 'use of multi-sensory resources' for both

Inner-directed (-25%) and Other-directed (-5%) groups was shown. The former group result was accompanied by increased percentages in 'student reinforcement' (+158%), 'feedback' (+96%), and 'ensuring relevance understood by students' (109%) (Tables 29-40).

b. Tables 41-43 indicate results of 10 Behaviour measures subsumed under the three categories of Orienting, Instruction and Involvement. Although not statistically significant the Inner-directed and Other-directed groups showed Orienting behaviour gains of 19% and 35% respectively, in comparison with a decrease of 60% for the Low Involvement group. Comparison of Inner-directed and Other-directed groups, each in relation to the Low Involvement group, shows no significant changes in Orienting, Instruction or Involvement. There is however, in Orienting behaviours a clear increase for both the former groups (in the order of 30%) in comparison with the Low Involvement group (Table 56).

c. A comparison of Inner-directed versus Other-directed groups, each in relation to the Low Involvement group, showed no significant difference in the relationships (Tables 44-58). However, estimated difference scores indicated greater change in 'student participation' between the Other-directed and Low Involvement groups (Table 46), greater change in 'feedback' to students between the Inner-directed and Low Involvement groups (Table 48), and for use of 'multiple examples' in favour of the Low Involvement group in comparison with the Inner-directed group (Table 49).

d. Teaching behaviours over the 5 year period were extremely stable. One category, 'Neutral Informing', increased just over 2% while all other changes were less than 1.5%.

Implications arising from the specific results presented throughout this section are discussed in the chapter which follows.

CHAPTER 6

DISCUSSION

Introduction

This study has been designed to identify the effects of traditional forms of staff development. It was therefore necessary to meet standard role expectations of those involved and to operate within existing traditional relationship and process norms of the faculty. This provided an experimental situation closely approximating the faculty under normal operating conditions. In addition the results provide practical information on the relative effectiveness of three modes of involvement in staff development activity. In order that the findings may be usefully discussed within variables of the model of implementation used for this study, comment is integrated with a range of current theory and research relating to learning, educational innovation and staff development. A major focus is on implications of research results which are then used to derive principles for the guidance of staff development practice.

A new four variable model of implementation comprising interdependent influencing factors, the learning process, system components and an innovation, has been used (Figure 5). Specified change in the instructional role has been defined as the criterion of success. Changes were grouped within the three interrelated categories of attitudes, knowledge and behaviour.

The premise underlying the model is that Interdependent influencing factors activate the learning process to bring about changes in specified components of innovating systems. This process model was applied to the present study.

Interdependent influencing factors have been defined "as having potential for affecting the learning process which causes change in the system". These factors include:

1. the type of change proposed,
2. the environment and educational setting where the change is to take place,
3. the strategy of change to be used,
4. and participants' individualized perceptions of that change.

The **learning process**, presented here as the catalyst for implementation, has been defined in terms of ten factors demonstrated to have potential for effecting learning, broadly categorized as goals, effects and involvements (Ch.4, pp.50-54).

The **innovating system components** specified as targets for change were attitudes, knowledge, behaviour, subject matter and organization. Attitudes, knowledge and behaviour are hypothesized as determining effectiveness of the teaching role in its restricted application relating directly to person to person aspects of instruction.

For the purpose of this study the **specific innovation**, to be implemented within the broader rubric of staff development, was learning centered instructional behaviour.

Evaluation of staff development programmes takes a variety of forms. Output measures include counts of workshops and seminars, participant numbers, papers published and resources distributed. Outcome evaluations involve assessment of participants and may be presented as a measure of change toward specified goals. A third form of evaluation is based on measures of effective instructional performance. It is directed to "determining the extent to which practice approximates an ideal formulation" (Rhodes & Hounsell, 1980).

Where all forms are applied to the same project it is possible for results of 'output' evaluation to be highly satisfactory, and 'outcome' measures to show no change while 'instructional' evaluation can indicate which aspects of potential effectiveness have been omitted (Rhodes, 1980). This three level approach has been applied in the present study to evaluate degree of implementation. Listings of courses and participation describe 'output', change measures evaluate 'outcomes', while the 'Measure of Learning Potential' allows identification and evaluation of instructional omissions.

It is reasonable to assume that all staff development activity relating to the teaching role has the intent of bringing about change in instruction. The broad focus of this study has been to assess the degree to which a limited range of currently operating staff development approaches have brought about change in the teaching roles of university staff. Such change may be attitudinal. It may involve additional knowledge or culminate in different perceptions of existing knowledge. It may involve changed patterns of behaviour. These patterns of teaching role behaviour can be exhibited through indirect preparatory activity, interactive behaviour with peers, or instructional change.

1. Indirect preparatory activities include syllabus construction, specification of objectives, adjustments to organization, gaining new skills in the audio-visual field, development of alternative evaluation and testing techniques or obtaining new teaching resources.
2. Interactive behavior with peers can involve discussion of innovative ideas and techniques, or seminars and meetings to identify common problems and possible solutions. It includes shows of collegial support and involvement. It is also reflected in individualized seeking for information and reassurance.
3. Change in the direct instructional behaviour of staff is however the ultimate intent of the staff development process. This will not always involve direct interaction with students but in the great majority of tertiary situations, direct contact is the norm.

The focus of this staff-development study was on implementing changes in direct instructional behaviour rather than indirect preparatory or peer interactive behaviours.

Continuing requests for further courses, personal assistance and group guidance, and reports in journals and conference papers, Gregg et al. (1986), Climo and Gregg (1984), Studman (1984) are evidence that a number of participants viewed the project as successful. During the present study changes have taken place. They include new syllabuses, modifications to teaching methods, statements of objectives and cooperative team attention to problem areas. Evaluation of the

effectiveness of staff development modes monitored during this study must be based on the following questions.

What changes were proposed?

What were the criteria of change?

To what degree were specified changes implemented?

In terms of the answers to these questions and from statistical evidence derived from the current study it can be stated that proposed changes to instructional roles were not implemented.

Attitude Change

A major finding of this study is that traditional forms of staff development are related to attitude change of teaching staff toward their instructional role, $p < .01$ (Table 1, p.99).

In the present study "attitude change" reflects but one measure of implementation. In the model of implementation structured for this study (Figure 5), criteria for change were specified in the three domains of attitudes, knowledge and behaviour having a common basis in the determinants of learning. The degree of attitudinal change could be seen as successful implementation of one of the trilogy. It was based on interview data. A modified 'critical incidents' technique was designed to preclude direct statements of attitudes. These were derived from participants' descriptions of substantive events. Taken in isolation the results contain two main implications.

Firstly, lecturers' beliefs concerning the teaching role changed on specific dimensions. These beliefs related to overall tertiary teaching or a global perception of those involved about the 'generalized other lecturer'. They reflected more acceptant attitudes toward the need for subject matter to be relevant, $p < .01$ (p.100); toward student involvement, $p < .01$ (p.101); inner-directedness, $p < .05$ (p.102) and responsibility for motivating students, $p < .01$ (p.102). These factors were perceived as good, desirable and worthwhile as reflected in the measures obtained.

Secondly, such expression of values did not necessarily indicate any personal commitment to action. The expression of attitude concerned an impersonal generalized lecturer role and could not be taken as a reliable indicator of future personal change. While such statistically determined changes may signal awareness of the values necessary for future change they are not sufficient to warrant a belief that participants are willing to undertake that change. What can be said is that the implementation of attitude change was successful on specific criterion variables, to quantified degrees under particular modes of staff development.

As predicted, the Inner-directed staff development mode contributed most significantly to change in attitudes to instruction. However the attitude change for the Other-directed group was also significant, $p < .001$ (Table 9, p.104), providing evidence that participation in traditional forms of staff development is effective for modifying attitudes. These results are in accord with Havelock and Havelock (1973), who concluded that staff development activities may be more effective if based on factors which utilize existing norms and dynamic relationships of the professional reference group. Similarly, the results support Hewton, Becker, Parlett and Simons' (N.D.) claim for the need to shift from conventional forms of training toward cooperation and dialogue.

While results for the Low Involvement group were not statistically significant, there was a consistent increase in all but one aspect of the attitude variable (9% to 35%, pp.99-104). It appears likely that a number of common influencing factors such as attention of those in authority, collegial interactions and organizational changes, were operating in all three staff development modes.

In the present study, a comparison is made of attitude changes between Inner-directed and Other-directed modes, both in relation to the Low Involvement mode. Although both the former groups displayed significant overall attitude change, only Inner-directed group results are significant in relation to change shown under the Low Involvement mode, (attitudes to objectives, $p < .05$; attitudes to relevance, $p < .05$;

attitudes to student involvement, $p < .01$ and attitudes to inner directedness, $p < .01$.), pp.105-106. While all staff development modes may affect attitudes, the results of this study indicate that an Inner-directed approach is the most effective. In terms of the implementation model used (Figure 5), the Inner-directed mode of staff development is hypothesized to have presented "Influencing Factors" in ways that activated principles of the "Learning Process" to bring about changes in staff attitudes to the teaching role.

Knowledge Change

With such clearly demonstrated and statistically significant changes in attitudes, it might be reasonably expected (at least for lecturers involved in the high attitude change, Inner-directed mode of staff development) that some degree of knowledge change would have resulted. Such was not reflected in the results. Knowledge of learning, (relating to relevance of subject matter, student involvement and motivation of students) promulgated by the constrained staff development modes employed, remained remarkably stable over all groups. This may be attributed to the indirect approach adopted in structuring the questionnaire, an approach which requested information on staff teaching activities from an applied knowledge perspective. It may also be an effect of using only staff development interventions traditional to the university involved. The relatively brief, isolated and voluntary nature of the courses offered could be seen as inadequate to effect any worthwhile, measurable changes in professional knowledge of a complex array of learning principles and practices.

Knowledge and behaviour within adjunct teaching roles changed and was reflected in modified teaching methods and resources. Overall knowledge, as expressed on the basis of criteria specified before implementation attempts commenced, did not show statistically significant gains. Knowledge of objectives showed a statistically significant difference between the Low Involvement and Involved groups, $p < .05$ (p.109). This indicated a mean decrease in knowledge of instructional objectives for both Inner-directed and Other-directed

modes, while the Low Involvement mode showed a small increase. These findings illustrate a common displacement phenomena, that the easily visible, contributory artefacts and images of an innovation become the focus rather than the more difficult to internalize principles of instructional behaviour. That is, the influencing factors appear to have not activated principles of the learning process sufficiently even to maintain, let alone to bring about increases in knowledge concerning the teaching role.

Behaviour Change

The model of implementation advanced for this study proposes "Skills" or teaching behaviours as one of the Innovating System Components to be the subject of change. This change was specified to encompass ten behaviours criterion referenced to 55 teaching competencies. Results indicate a high degree of stability in all ten categories over the five year period for all three modes of staff development. The Determinants of Learning summarized in Figure 7 and held to reflect the principles of learning, are used herein as a basis for the discussion of results. In terms of the model of implementation proposed, specific aspects of the Learning Process must be activated by Influencing Factors before Innovating System Components such as attitudes, knowledge and skills can change.

Shipman (1974) questioned the desirability of this specificity of criteria, claiming it may be the catalytic effects of projects that are important, rather than the more limited impact of the specific curriculum objectives. Acceptance of Shipman's basic premise does not necessarily imply an either or approach, or a negation of the need for specificity. Rather it underlines the need in any identification of specifics to maintain awareness of related processes and products. It can be argued, (as an extension of this awareness), that while desired outcomes may be achieved, this may be at the cost of other also desirable states. For instance, increased energy and resources expended on audio-visual aids may result in decreased feedback to students, less attention to planning or less student contact.

If the behaviour categories advanced for recording change in teaching performances in this study are valid determinants of learning (see Table 59) then several implications arise.

Firstly, within the Orienting Cycle (see p.85 above and Appendix D), participants spent a very small proportion of their teaching activity establishing a positive learning climate for their students. In practice an average of .9 of one second was devoted to that purpose during an average 50 minute teaching session. Teachers spent an average of 4.5 seconds per session ensuring students understood the relevance of what was being taught and 15 seconds ensuring that students understood what was to be learned. When combined, these three "Orientation" principles directed to facilitating student learning were used an average of just over 20 seconds for each teaching session observed.

Secondly, within the "Instruction Cycle", reinforcement of student learning behaviours was observed for .11 of teaching time or an average of 3.3 seconds per teaching session. In combination with results for the three variables outlined above, we find that four factors which have been shown to have a profound effect on learning (see pp.50-54 above), are on average activated for less than 24 seconds in these 50 minute teaching sessions. It appears reasonable to suggest that increased activation of these four factors in university teaching could help to improve the quality of the learning environment to which students are exposed.

Thirdly, university teachers spend a moderate proportion of teaching time on arousal strategies (approximately 1.5 minutes per session), on providing feedback to students (approximately 2 minutes per session), and on allowing student participation (approximately 3.5 minutes per session). While there are wide variations between individuals, in general it can be stated that in total, these three determinants of learning are activated for approximately 7 minutes per teaching session in the service of student learning.

The balance of teacher activity for an average 50 minute teaching

session was directed to provision of information concerning both subject matter and organization of sessions (12.5 minutes), providing examples of concepts and principles presented (17 minutes), and focussing student attention (12.5 minutes).

If the premise is accepted that university teaching situations are directed to assist student learning, and if it is also accepted that the teaching behaviours discussed above can be instrumental in providing a potentially effective learning environment, then it would appear that the almost total omission of four "Performances" from teaching practice should be a matter for concern.

Furthermore, the great majority of staff development sessions were presented in university venues, by experienced university staff using traditional university teaching methods. There is little evidence to suggest that teaching methods used by personnel presenting staff development sessions and courses during this five year study were greatly different from those observed being used by participants. If this is so, then the overall impact on participants' appreciation of objectives, relevance of content and learning climate of courses presented would be minimal. With reinforcement of learning behaviour also being minimal, little change in actual teaching behaviour could be expected.

Post intervention interview statements indicated that indirect strategies of staff development were insufficient to implement specified behaviour changes and that direct methods were necessary. Staff development activity during the current study was diverted to mainly syllabus and curriculum development activities. Participants saw instructional techniques as irrelevant or of lesser concern. Such conflicts of interest are common in development projects. In discussing this problem Eraut, Connors and Hewton (1980) concluded that senior management saw institutional needs in terms of coping with change. They wished to maintain stability, morale and a sense of direction amidst rapidly changing external circumstances. Educational developers, on the other hand, wished to stimulate change and re-examine institutional norms that appeared to affect the quality of

teaching.

Contrary to expectations it was found that Inner-directed staff development did not contribute to significant change in "overall teaching behaviour" (Inner-directed versus Low Involvement group, $p > .8$, Table 44, p.121). Also contrary to predictions, significant changes in attitudes were not accompanied by changes in teaching behaviour.

Other researchers have also reported the difficulty of reflecting attitude and knowledge changes in observable behaviour. Gross et al. (1971) found that implementing changes involving teaching strategies or relationships with students was more difficult than implementing changes involving resources or organization. These results also support Dalin (1973) who found no evidence to sustain an assumption that greater involvement of teachers automatically produces better results. In discussing the problem of implementation, Fullan and Pomfret (1977) conclude that active participation in the central process is critical rather than participation in decision making. Results of the present study may be explained in the light of these conclusions in that the only significant behaviour changes were in the use of audio-visual resources, $p < .05$ (Table 14, p.118). This change was consistent and equally significant statistically across Inner-directed and Other-directed modes, indicating that the greater involvement of Inner-directed participants was not an influencing factor.

Use of multi-sensory resources decreased for both Inner (-26%) and Other-directed (-5%) groups in relation to the Low Involvement group (+5%). One explanation is that these groups were more aware of the distracting effects of redundant audio-visual media. Another possibility, justified by the data, is that increased attention to providing feedback, reinforcement and neutral information reduced opportunities for the use of such resources.

Results indicate that staff-development involvement compared with low involvement did not produce a statistically significant effect on other instructional behaviours. This may be partially attributed to

small numbers in each group as inspection of the data indicates. Under the generic category of Orienting behaviours the Inner-directed and Other-directed groups recorded 19% and 35% increases respectively. In comparison the Low Involvement group recorded a decrease of 60%. It is important to note, however, that initial scores for Orienting activities were extremely low. Quite small changes are represented by disproportionately large percentages.

A major outcome of this study is that instructional behaviour remains consistent over time and mode of staff development. Apart from changes in use of multi-sensory resources, behaviour scores over all categories were extremely stable for the five years of the study.

Factors contributing to this stability despite staff development interventions, included lack of motivation to change and lack of the skills and knowledge to implement the changes (Gross, Giacquinta & Bernstein, 1971, p.202). The constraint of using only existing staff development practices meant that little feedback or reinforcement concerned with instructional behaviours could be provided. The difficulty of changing teaching behaviour apparent in the present study, is based in the problem of providing support and reinforcement in classroom situations. This conclusion is supported by Gaff (1976) in the statement "lasting change can best be brought about by stimulating, supporting and reinforcing positive efforts of faculty members"(p.7). More often staff development courses taught about skills and procedures of classroom interactions rather than providing for actual behaviour change through applications of micro-skill methods (Turney, Cairns, Williams, Hatton & Owens, 1973). The result of using this standard hortative approach in the current study may be reflected in the complete lack of change in teaching behavior for all groups. In terms of the model proposed for this study (Figure 5), it is believed that major influencing factors such as "Change Strategy" and the "Educational Setting" were inadequate to mobilize the "Learning Process" in order to bring about change in specified teaching "Skills". In the section which follows, discussion of results is based on the model of implementation structured for this study.

INFLUENCING FACTORS

1. The Innovation

The first of three interrelated factors in this initial variable (Figure 5), concerns the type of innovation or goal specified for implementation. Fullan and Pomfret (op.cit. p.368) identify low explicitness as leading to user confusion and a low degree of implementation, depending not only on perception of change but the capacity to perform in new ways. It is not, however, just the perceptions and capacity, but also the provision of appropriate learning situations that make possible both adequate perception of objectives and habituation of new behaviour. Mismatch between the objectives of innovation and existing states of participants can negate most endeavours. This may help to explain the results of this study, endorsed by the findings of Rogers and Shoemaker (1971), who, after summarizing the findings of sixteen studies, concluded that complexity of an innovation as perceived by members of a social system is not related to its rate of adoption. It is a defensible hypothesis that complexity is specific to each participant as mediated by the motivational factor of personal relevance. This in turn may in part be a product of current work environments.

Fullan and Pomfret use a 'managerial' versus 'user' dichotomy to characterize the implementation environment, and conclude "there is no evidence that leads us to select one approach over the other" (p.381). However the present study, at least for attitude change, does indicate evidence for using the user perspective, and supports Fullan and Pomfret's assessment that where a priori expectations of an innovation are difficult or require a high degree of user input then the user perspective is more effective. Rogers and Shoemaker (1971) in analyzing seventeen studies found 100% support for the generalizations that:

Change agent success is positively related to his client orientation

rather than change agency orientation (7-2, p.380);

Change agent success is positively related to the degree to which his program is compatible with clients' needs (7-3, p.380);

Change agent success is positively related to his credibility in the eyes of his clients (7-11, p.382).

These findings indicate strong evidence in favour of modifying or basing any innovation exercise so as to respect and utilize the user perspective, a conclusion supported by the results of attitude change measures in the present study.

2. Individual Perception of Participant Status

A critical 'influencing factor' in attitude change is the perceptions of individuals concerning their status as participants. Seldom does research indicate whether status is volunteer, self-selected or passive acceptor. In the present study all three are to be found. Those participating in Inner-directed involvement were volunteers in the true sense of the word with complete autonomy at all times. Other-directed participants were self selected in terms of consistent on-going participation over a period of years, while the passive acceptors are represented by Low Involvement status. The former two categories of participation are represented as 'problem-solving' and 'opportunism' in the research of Berman and McLaughlan (1976), whose findings of the efficacy of problem solving approaches are supported by the present study. A range of studies (Berman & Pauly, 1975; Naumann-Etienne, 1974; Evans & Scheffler, 1974; Crowther, 1972) also provide evidence that existing organizational climates of adopting units play a critical part in determining whether implementation takes place. In the present study this conclusion is supported by participant status in the various staff development groups. Where leadership within a department adopted a problem solving approach or provided a climate supporting individual attempts to implement change, those departments contributed a higher percentage of members to the Inner-directed group. It was within this group that greatest attitudinal changes occurred and also the most non-criterion changes (such as alternative teaching methods, curriculum

modification and resource preparation). In terms of the implementation model proposed (Figure 5), it would appear reasonable to suggest that Individual Perceptions (of Inner-directed group members), activated the Learning Process related to relevance and reinforcement to change an Innovating System Component, namely "attitudes".

3. Strategies

A further 'influencing factor' justified by the present study is the strategy used in attempting to implement change (Figure 5). Fullan and Pomfret (1977, p.387) conclude coercion does not work and indicate it may increase adoption but not implementation. House (1974) provides a further reason in arguing that the personal costs of adoption are often high and leave little energy for full implementation. On the other hand a non involved, non participant peer group can provide "the rock firm resistance of more mature colleagues" which ensures that any academic "using the new skill or ability can all too easily fall by the wayside if it is a solitary and unassisted activity" (Cowan, 1977). The need for skills and attitudes learnt at courses to be integrated into the work environment through supportive strategies is clearly indicated. Results reported in chapter 5 indicate that age and previous experience are not related to the degree of implementation, a finding in agreement with Crowther(1972) and Evans and Scheffler (1974). It appears that a strategy that is Inner-directed in genesis and which involves collegiality or membership of common interest groupings is related to the greatest degree of change. Havelock and Huberman (1978) lend support for this view indicating that a problem-solving strategy is a basic principle of adult learning. The greater changes effected in attitudes and aspects of knowledge by Inner-directed strategies further support Havelock and Huberman's (1977) conclusions that the individual user or adopter belongs to a 'network of social relations' which largely influences his adoption behaviour, that his 'place in the network' (centrality, peripherality, isolation) is a good predictor of his rate of acceptance of new ideas, that 'informal personal contact' is a vital part of the influence and adoption process and that 'group membership and reference group identification' are major predictors of individual adoption.

Eraut, Connors and Hewton (1980) provide guidance for effective strategies in the statement that, in order to implement change in patterns of instruction, "the diagnosis of training need has to include a strong element of self diagnosis; and that has never been easy." There is the perception that "personal autonomy and professional status appear to be challenged and even modest enquiries about having needs are likely to evoke hostility." (p.19). They conclude that "all higher education teachers need to have direct, by training, or indirect by consultancy, access to this knowledge." However results of the present study indicate that despite "self diagnosis", "personal autonomy and "professional status" being supported in the Inner-directed mode of the present study, and having "access by consultancy" to training needs so identified, the Inner-directed group teaching skills were not significantly changed. It appears that in order to bring about change in behaviour, strategies directed toward staff mastery of specific behaviours are also required.

A final comment is necessary concerning an aspect of university staff development activities inherent in both "individual perception" of participant status and "strategies" of implementation discussed above. There is a tendency to direct attention away from more basic causes through the application of a blame-placing model which affects both these influencing factors. This may take the seemingly benevolent form of directing token resources into supporting, and even initiating Other-directed staff development activity and thus shifting attention and resources from needs as perceived by participants. The basic, complex and often individualistic problems are ignored and a convenient simpler symptom presented for treatment. Administrators are satisfied that appropriate action has been taken. Focussing attention on determining whether the bandaid is the best currently available distracts from identification and treatment of the real malady, in this case a failure to implement learning-based staff development processes.

THE LEARNING PROCESS

Introduction

In what way and to what degree do the results of the present study justify or indicate the need to modify the model of implementation proposed in Figure 5? Fullan and Pomfret (1977, p.393) claim that a practical theory of innovation must not only address the question of what should change but also the question of how to bring about that change. Innovation involves individuals. It is individuals who must change. Learning is a necessary precursor of change. This study investigated the learning process as it implemented or failed to implement specified change in individuals. The learning process for the purposes of this study has been defined in terms of ten factors subsumed by goals, effects and involvements (pp.50-54 above).

The focus of this study is utilization of the learning process as it affects teaching staff and is reflected in changed instructional performance, that is, as evidenced by the implementation of specific classroom behaviors. In what way and to what degree do influencing factors affect the learning process so that specified behaviour changes result? What evidence is there to support or deny validity of the learning process as a critical function of staff development interventions?

Measures of student outcomes as product were inappropriate for the present study. Measurement of variables that affect implementation of specified teaching behaviors was appropriate. Teacher behaviours selected for implementation in this study were those on which there was reasonable consensus as to the positive effects on student learning. In the present context this was only relevant in that professional accountability and professional responsibilities of staff were not compromised. More importantly, even if these learning process variables are accepted as vital in controlling the learning (and hence behavior changes of teaching staff), their validity for inclusion in the implementation model derived for the study still needs further investigation. However, the degree to which influencing factors such

as staff development mode or "Educational Setting" are related to changes in attitudes, knowledge and behaviour of participants provides greater explanatory value when examined in terms of the learning process.

GOALS

What light do results of the present study throw on the premise that goal aspects of the Learning Process are an essential variable for the analysis of success or failure in implementing educational change? It has been suggested that learning is effected in terms of three aspects of goal perception. These concern the clarity, relevance and consistency of goals as perceived by the participant. This belief in relation to clarity and relevance of goals in tertiary teaching, is substantiated by the work of Ford (1981).

Course based performance might be improved by ensuring a better match between the learner's encoding schema and retrieval requirements; in other words by helping the student to perceive more accurately the nature of what is required. However any wider conception of 'effective learning' cannot ignore the importance of a match between what the student feels is required within a course context and his or her own personal goals and values relating to a wider context.

(Ford, 1981, p.369, emphasis mine)

The only staff development mode where this interrelationship (of what the staff participant "feels is required" and "personal goals and values") was able to be actualized was that of Inner-directedness. Within this group, significant attitude changes provide support for the contention that perception of goal clarity, goal stability and goal relevance are principles of the learning process that contribute to effective implementation.

More general findings concerning rewards for tertiary teaching, are also pertinent to perceptions of goal relevance. The relevance of expending effort in modifying teaching behaviour is reduced when promotion, pay and personal satisfaction are not optimized (McKeachie,

1963; Berman & McLaughlin, 1978; deRome, Boud & Genn, 1985). While the process of learning new teaching skills in tertiary institutions is often not supported by perceptions of relevance in financial terms nor in increased student achievement, such factors were not examined in this study.

Scepticism exists as to the validity of both methods and goals promulgated by developers for learners. This is reflected in tension between faculty with an education focus and those in arts and sciences, based on fundamental conflicts over economic, political and ideological issues (Conant, 1963). In the current study goals for the Other-directed group were generally determined by outsiders who were predominantly from the discipline of Education.

Judge (1982) has documented the low regard in which education faculty are held and the manner in which other faculties distance themselves from the "unattractive world of teacher education." Such attitudes denigrate the value of Other-directed staff development activities conducted by educationalists and such denigration may reduce the probability of change in participants because of effects relating to the goal-relevance principle of the learning process.

Traditional staff development practices as used in the present study, were characterized by short courses, hit-and-run sessions and special interest seminars. They lacked the overall consistency and cohesion necessary for progress toward clearly nominated let alone vaguely appreciated goals. Objectives of sensitizing to new ideas and values, stimulating increased effort or motivating toward alternative outcomes as reflected in attitude changes were achieved; however, these are but prerequisites for specific change and the potential for long term results is dissipated without a long term sense of mission (Rudduck, 1976; Hunt, 1984; Ashcroft, 1983). The incompatibility of goals in subsystems of the organization operates to encourage attention to smaller unitary components of the teaching role not requiring modification of other components (Miles, 1967). This study presents some evidence that staff development programmes must have the power, processes and personnel able to activate the learning process relating

to rewards, relevant goals and consistent goals as perceived by participants. These conditions existed within the Inner-directed mode of staff development and are related to significant attitude changes. Without this perception by participants, programmes may be ineffective because they cannot deliver key variables of the learning process.

Student evaluations of university teaching may contribute to staff perceptions of relevance. Effort expended in student evaluations of teaching programmes at the university may be assessed in the light of the 'Influencing factor - Learning process' model proposed here. The critical criterion is whether student feedback to staff is effective in creating change in teaching programs. Where individual staff value the opinions of students, see the derived implications as relevant and consistent with long term personal goals, this may well result in positive changes. Otherwise it is more likely that rationalizing or defending activity will occur or any action will be directed toward avoiding criticism and sanctions. Students have reported the reality and importance of relationships with staff but "there is little evidence of change in the preparation of teachers" (Lublin & Barrand, 1986). Staff development programmes if they exist at all, may not convince staff of the potential increments to learning that can accrue through positive student-staff relationships, let alone train staff in appropriate relational skills. Failure to change both knowledge and teaching skills may well be ascribed in part to combinations of learning factors relating to the clarity, consistency and relevance of goals outlined above.

A premise of this study is that where staff development goals are clearly understood, are consistent with participants' wider values and are perceived to be relevant they positively affect the learning process. However, even goals that conform with this premise must be examined in career terms. Moses (1985), in examining the influence of promotion on tertiary staff activities, concludes that "what actually happens on promotions committees is inaccessible data; what staff believes happens is not...and many in this sample also perceive the university as interested more in publications than in scholarship and some adjust their activities accordingly."

While it is still common to find surveys which claim we are unable to answer the question, 'How well are we teaching?' (Manthei 1986), this is no longer true when support systems based on student assessments of teaching are concerned. A most telling investigation into the effects of applying the Reward-Relevance concept to tertiary teaching (Moses, 1986) reports that of 104 staff involved in evaluations of their personal teaching activities, over 50% either could not say what their university's attitude was to the teaching role or saw the university as indifferent to evaluations of teaching. 94% of staff accepted that such evaluations should provide members with feedback for the improvement of teaching and subjects. The effect however on staff was striking. Only eight staff had not changed their teaching in some way and this was "mainly because (the evaluations) were positive and nothing specific could be changed". All other staff acted on the feedback received. Key factors in this result might well be that such evaluations could be used in that university for tenure and promotion purposes, however "for many the positive feedback from students was their only source of encouragement. They felt reinforced in what they were doing" (p.202). This positive effect of consultation is also supported by the earlier findings of Centra (1972).

The key factor in Moses' findings in terms of the suggested model, is that variables of the learning process, namely rewards and relevance, applied in natural settings had a predicted outcome. Learning in the sense of both attitudinal and reported behavioural outcomes did occur. That changes were not limited to the instructional role but to the wider context of tertiary teaching only serves to underline the value of the reward-relevance process, a perception supported by Jones (1985) in discussing reasons for staff evaluations in relation to "Individuals" (pp.3-4). How did this effect the implementation or non implementation of changes in attitudes, knowledge and skills? Whatever the construct validity of the concepts used by students in their assessments (Anderson, 1985) it is irrelevant for the present context. The reward-relevance factor of the learning process appears to hold validity. Goal factors are aspects of "The Environment" and "The Educational Setting" (Figure 5), and as such are held to activate the learning process through principles of "clarity",

"relevance" and "feedback" (from students) as discussed above. The Inner-directed and Other-directed modes of staff development are representative of differing levels of application of these principles, a difference which is reflected in attitude change, however the application of this factor in the present study has been constrained by the protocol that all contacts and interventions were restricted to current and traditional staff development practices. Existing staff perceptions as to how the reward-relevance factor was applied and a belief that the objectives sought were not part of their long term goals reduced the impact of this aspect on the learning process. Promotion, personal long term purposes and supportive consultation could not be deliberately used in attempts to change instructional behaviour. The lack of change in knowledge and behaviour may well be attributable to these omissions.

EFFECTS

The second cluster of factors which control learning can be subsumed under the title 'Effects'. These include the effect of an alternative perception of relevance based in the learner's past experience (Gagne, 1962; Gagne & Briggs, 1974; Gagne, 1977; Anderson & Pichert, 1978), the effect of feedback (Burrows, 1973; Kulhavey, 1977; Block, 1971), and the effects of reinforcement (Skinner, 1969; Ward, 1976; Lysakowski & Walberg, 1982).

Feedback.

During the current study it was clear that tertiary teachers, as much as their pre-tertiary counterparts, practise the face-to-face teaching role in relative isolation. Throughout the five year study, with few exceptions, lectures, tutorials and workshops were presented by a single university teacher. The only exceptions were field trips, large laboratory practicals and introductory sessions for the larger courses. All teaching sessions observed in the obtaining of pre and post teaching behaviour data were single teacher situations. Interview data indicated that few staff had ever observed a contemporary in a

formal teaching situation and that such experiences would be welcomed. Comment and feedback from others is difficult to obtain and often resented. Data from the Levinson-Rose and Menges (1981) summary of research indicates that feedback involving consultation affected subsequent teaching behaviours. Hoyt and Howard (1978) found that feedback for teachers from staff development services increased student ratings. Further support for the effectiveness of feedback, involving both videotape and consultation for improving instruction, is provided by Bray and Howard (1980). A summary of twelve studies of student feedback to instructors (Levinson-Rose & Menges, 1981) finds there is "more evidence for than against the effect of feedback on end-of-term ratings...where feedback is supplemented with consultation."

Reinforcement.

Reinforcement principles are seen to be functioning when staff receive positive feedback from students, peers and administrators. The effectiveness of reinforcement in the initiation, maintenance and directing of human behaviour is well documented (Ayllon & Azrin, 1968; Sulzer-Azaroff & Mayer, 1977) and requires little justification for inclusion in a discussion of the determination of learning.

The literature of tertiary staff perceptions of reinforcers is relevant and embraces both intrinsic and extrinsic. McKeachie (1963, p.1163) illustrates the former in listing teacher satisfactions gained at university. These include pleasure at seeing a student develop, intellectual interchange with questioning minds and fresh ideas and in having disciples who respect and admire. Such reinforcers may have little application for initiating instructional behaviour, although the maintenance and directing functions may apply. Similarly, the rewards of salary are diffuse across the spectrum of academic activity. Unless the linkages are clearly drawn between promotion, tenure and quality of the instructional role, the reinforcement principle will not apply. Such links to extrinsic reinforcers were applied in an ethnographic study of in-service effectiveness (Freiberg, Townshend & Buckley, 1982). Consultants who provided both intrinsic and extrinsic rewards were more effective in effecting transfer. These rewards consisted of

coupons redeemable for instructional materials (p.195). The difficulties of relating data to specific outcomes is apparent in such studies, but analysis of the 125 protocols indicated clear transfer to teaching practice, not only of knowledge and attitudes but also of behaviour. Vicarious reinforcement effects on observers (Travers, 1972) cannot be overlooked in the present study and may have been a contributing factor in the low but consistent positive attitude changes across variables for the low involvement group.

Reinforcement techniques have been successful in modifying such diverse adult behaviours as the performance of direct care staff (Burgio, Whitman & Reid, 1983), increasing attendance and social interactions among the elderly (Quattrochi-Tubin & Jason, 1980), reducing nonessential miles employees drove their personal cars (Foxy & Schaeffer, 1981) and reducing heating oil consumption through feedback and commendation (Seaver & Patterson, 1976). Reinforcement research directly applicable to modification of tertiary teaching appears to be non-existent. It became apparent during the present study that any reinforcement and feedback received by teaching staff was not directly related to instructional behaviour but rather to more administratively visible adjuncts such as production of course objectives or new curricula promulgated as official group or departmental goals. These latter were public products, visible to those controlling both social and more practical recognitions, while teaching remained an unobserved and extrinsically unrewarding activity. The question may well be raised concerning the relationship of job satisfaction to actual performance in that job. Correlations for these two variables contained in the meta analysis of 74 studies carried out by Laffaldano and Muchinsky (1985), and the early studies by Vroom (1964), are consistent at around .14. They indicate that under most employment conditions job satisfaction and actual performance are only slightly related. It would appear reasonable to suggest that reinforcement procedures based on salary and working conditions will have little effect unless they are made contingent on teaching role behaviours. At the same time, the use of reinforcement and feedback to staff concerning indirect teaching behaviour has a positive effect on adjunct performances, and hence performance satisfaction, of staff primarily

interested in instruction, even when total job satisfaction is at a low level.

Past Experience.

While feedback and reinforcement are sound principles of learning, even when they are applied an effective learning situation is not an automatic outcome. Still missing is consideration of conditions within the learner. Learner centred instruction is based in a well established body of knowledge involving mediation theory and research (Gagne, 1977; Ausubel, 1978; Taylor, 1977).

The missing conditions are to be sought within the individual, rather than in his external environment. They are states of mind that the learner brings with him to the learning task; in other words they are **previously learned capabilities** of the learner himself. These capabilities appear to be a highly important set of factors in ensuring effective learning.

- (Gagne & Briggs, 1974, p.9)

These previously learned capabilities, having connotations of entering behaviours, initial knowledge levels, locus of control and cognitive schemata, are centred in each participant's past experience (Ausubel, 1978). Such capabilities brought to staff development participation, reveal great diversity between individuals as reflected in results of both pre and post measures of attitude, knowledge and skill in the present study. The Other-directed mode of staff development in this study was directed to large groups, and structured by 'others' toward goals basically determined by the prejudices and preconceptions of those 'others'. It could not be isomorphic with even the past, experience based and therefore relevant knowledge of participants, let alone their aptitudes, attitudes and existing skills.

How can these needs, embodied in such diversity be met? One possible approach is to identify and assess needs on a broad front in order to determine not only what is possible in terms of outcomes, but also to determine what is acceptable and desirable to both the participants and others in the organizational hierarchy (Boydell, 1976). While there is a need to involve the learner in identifying his own needs (Hunt, 1980), it is also necessary to consider the wider

context perceived by administrators or change agents. This is in accord with the findings of Taylor and Helmer (1978), in an investigation of the perceptions of all groups involved in an educational change, (teachers, students, parents and patrons), to provide administrators with requisite decision alternatives. Their conclusion was that administrators require such information or will "continue to muddle through without attempting to gather information for defining and selecting alternatives". However, whatever the goals determined by administrators or change agents, it is existing states, based on the past experience of participants, which should provide initial parameters. This is necessary if learning, change and implementation of specified goals are to be effected.

Past experience of various participants in the Inner-directed group determined the specific problems identified and their strategies for problem solution. Arising from various dissatisfactions with the status quo, these included:

- (a) Mounting of an alternative tutorial programme, trialling and rejection of the alternative followed by a request for, and provision of, useful resources including a single practical text reference and a workshop to discuss the reference.
- (b) Previous participation of a member in a mastery learning course, allied with a high course failure rate led to a realization that higher standards of student attainment were possible, the modification of a lecture-tutorial programme into one which included a large proportion of self-paced learning and publication of the results.
- (c) A third problem led to the identification of student goal misconceptions as seriously affecting the focus of students' study. This led to extensive rewriting and structuring of objectives to be provided to all students as an aid to learning. Lack of follow-up and evaluative activities was a mark of previous change strategies repeated in this exercise.

The above assumption concerning the effects of past experience on Other-directed group members conforms with the meaningful verbal learning model of Ausubel (1961) and the distinction between deep and surface approaches to learning (Morton and Saljo, 1976; Biggs and

Kirby, 1983). It is probable that the approach of participant staff was initially one seeking solutions to problems or 'deep learning', but this appeared to be displaced because of staff development methods to a 'surface strategy' when information overload or irrelevancies were encountered. Past experience of the Low Involvement and Other-directed groups determined not only their participation levels but also the wide variety of learning outcomes exhibited. Staff development interventions based on the principles of matching treatments with the aptitudes and past experiences of learners, (aptitude treatment interaction methods, Cronbach and Snow, 1977) were not in any sense (except the most superficial), applied under constraints operating throughout the present program. As Combes (1965) observed, "the principle of readiness which governs so much of what teachers do in their daily jobs must also be applied to the teacher's own experience in learning to teach."

Each individual's perception is highly dependent on a system of anticipations or expectancies that 'are the residues of past experience' (Travers, 1977, p.229) and are also dependent on how learners interpret the requirements of the learning context, (Ramsden, 1985). Unless cues, appropriate to an individual's cognitive structures are made available, learning is restricted. Even the language used by staff developers inhibited accurate perception of staff as evidenced by periodic criticisms of the use of 'jargon' during episodes of the current study. Such criticisms support Wickelgren's (1979) observation that "When we don't understand someone who is speaking an unfamiliar language, our failure to understand is at the word level. We don't have the necessary word nodes to represent (encode) each word in the utterance...on a smaller scale, you experience a failure to understand at the word level whenever you encounter an unfamiliar word in English."

In essence, ability to evaluate or develop an idea is enhanced by possession of related knowledge, a position supported by Gagne (1973), who states; "Stimuli that enter directly into the performance for which learning is undertaken (include those) that activate recall of previously learned capabilities that are relevant to the learning...and

provide recall of information."

Based on the literature reviewed above and supported by findings of the present study in relation to attitude change of the Inner-directed mode and also supported to some degree by the defining characteristics of that mode, several conclusions can be drawn. Firstly reinforcement in a wide context is a necessary aspect of staff development for attainment of both specific personal change and changes espoused in broad goals of groups and organizations. The failure of staff development modes to implement such changes in knowledge and teaching behaviour may be the result of these modes not reinforcing participants for internalizing knowledge of learning principles nor for appropriate instructional performances. Secondly, feedback concerning appropriateness of change toward specified behaviours rather than generalized acceptable behaviours in wider contexts is essential, if specified outcomes are to be implemented. The failure of staff development modes used in this study to implement changes in knowledge and behaviour may also be due to a failure of these modes to provide feedback concerning specific outcomes. Finally, the saying 'start where the learner is' provides a sound initial directive for structuring staff development interventions.

INVOLVEMENTS

Implementation of change is not only dependent on application of learning principles subsumed under goals and effects previously discussed. It also depends on use of principles involving focussing attention, participation and the interactional climate, all subsumed under the term 'involvement'. These principles were not operationalized effectively under constraints applied to the present study, nor is it believed that it is possible for them to be applied to most traditional staff development as currently practised.

1. Focussing Attention

Staff development procedures used during this study were not successful in maintaining the main focus of participant attention on the narrow teaching role. During the five years of the study participants' attention was drawn to a wide range of potential innovations by many course directors. Some innovations related to a number of areas not directly related to the instructional role. Many of these, (such as alternative forms of testing and evaluation, organizational structures, resource development and timetabling), had little relevance for person to person behaviours involved in direct classroom instruction. More relevant changes concerned new teaching methods, but reflected a prevailing fixation on teaching rather than causing learning. This observation is in line with Hounsell (1977) who saw the use of the term 'the teaching and learning process' as inappropriate, because the focus of attention was almost entirely on teaching, with learning viewed at best as a by-product. Attention in this situation is dependent on the individual characteristics of participating staff and their attitudes and expectations. It is also dependent on the specific learning task, participants' perceptions of that task and the environment in which specified change is expected to take place. When expectations related to the strong distractors of organization and method, when the task was seen as overly multidimensional, and, when others in the environment focussed on group goals unrelated to direct instruction, ability to give attention to improving learning was markedly limited.

Levinson-Rose and Menges (1981) indicate that training of tertiary staff in the concepts of learning appropriate for higher education could be of particular relevance. This would be useful in focussing attention on relevant attitudes to learning and knowledge of the principles of learning as initial steps. However, if the aim is to improve student learning the prime concern must be to transfer these attitudes and knowledge into more effective instructional behaviours. Such a belief is in accord with the finding that teachers trained to recognize teaching related concepts and to implement these concepts in instructional practices, were able to change their teaching behaviour (Aubrecht, 1978).

Havelock and Havelock's (1973) linkage theory of change pointed up the need for "a willingness to listen to new ideas (openness) as an important prerequisite to change. This applies both to resource persons and users." While the overall attitude changes achieved in the present study may indicate such initial willingness, it is only by focussing attention on the specifics of instruction oriented ideas that the prerequisite for instructional change is formed. Attention is captured by the unusual; Sokolov's (1963) 'orienting reflex', Fabun's (1970) 'desirable future states', or Suchman's (1971) 'opensure'. However attending, as in the present study, may be too specific and focus on possibly relevant but isolated facets such as specification of objectives, learning students' names or improving the clarity of chalkboard presentations. It may be too generalized, that is, dissipated over many related but largely irrelevant attributes. It may be displaced onto personally relevant but non-criterion goals such as timetabling, construction of resources or preparation of test bank items. These are all irrelevant in terms of applying learning-oriented instructional methods. It is the directing of attention into areas which address the criteria of specified change and the existing states of individuals that indicates staff developers' ability to apply the principles of learning to their chosen fields.

2. Active Participation.

One of the premises upon which this study is based was that implementation of an innovation would be directly related to the degree to which those at all levels of the institutional hierarchy participated actively in all aspects of innovation. This would include fact finding, diagnosis of needed change and the ensuing formulation and reality-testing of goals and programmes of change. In practice, representatives of all levels participated including faculty deans and departmental heads. Despite the direction provided by this leadership it was difficult for staff developers not to determine the goals and methods of staff development activities. This observation is supported by Bennis, Benne and Chin (1969, p585) who note "even the

well-motivated, unselfish controlling agent will be tempted to ignore human variability and to do what he thinks is good for others rather than what they think is good for themselves...if he is unhampered by the right to choose as a basic human value." The logical and practical result demonstrated in the current study, is that a large proportion of potential participants took only a minimal part in any form of staff development. Unless the perceived rewards and punishments are sufficient to motivate active participation, limitations are placed on possibilities for learning. While the 'ripple effect,' (Kounin and Gump, 1961) may create change over time with children, at this adult level it may create little other than a small change of attitude and a confirmation that non-participation is a wise choice.

Bray and Howard (1980) indicate it is necessary for seminars to be skill oriented in order to influence teaching behaviour. McGee's (1980) research into the effects of in-service training also concluded that where the courses involved teachers in active participation and analysis of their own performances, subsequent classroom behavior changed and was stable over time. These skill oriented participations were not a feature of the current project, except in non-criterion areas such as constructing lists of objectives or test items and this lack is reflected in the consistently stable teaching behaviors of participants.

Further evidence of benefits from participation are found in a review of research on in-service education by Lawrence (1974). In analyzing ninety-seven studies, Lawrence found that programmes in which teachers shared ideas and provided mutual assistance were more likely to accomplish their objectives than programmes in which teachers worked individually. Benefits from participating in self determined goals and activities rather than those determined by others were also found, an outcome mirrored in the greater attitude changes of the Inner-directed group at the conclusion of the present study. Similarly Freiberg, Townshend and Buckley (1982, p.195) found that consultants who were more successful in changing teaching behavior, had encouraged teacher participation in the learning process and ensured they responded, reacted to and discussed the ideas presented.

It should be emphasized at this stage that individualistic participation related to increasing learnings concerned with direct instructional activities is the point of discussion. In any department or faculty there will be a significant level of participation in more general teaching oriented activities. Only some of this will be directed to improving learning. The challenge is to harness such general participatory activity, intensify the commitment and direct it specifically at learning oriented instructional behaviour.

As Kemmis and Hughes (1979) indicate, such activities are concerned with the process of marshalling both information and arguments which enable interested individuals and groups to participate more fully in the critical debate about a programme. Their thesis of 'self reflection in a critical community' is one of participation. Participation can be stimulating, exciting and rewarding and thus lead to higher levels of motivation. On the other hand it may be seen as threatening, time wasting and irrelevant leading not only to short term frustration but longer term rejection over a wide field of related variables.

The decisive factor is the individual's perceptions of the relevance of participation. The art of applying learning determinants to staff development, involves harnessing each individual's perception of relevance in order to reduce resistance to change. In discussing the problem of resistance to change, previous researchers (Gross et al., 1971; Gaskin, 1969; Nicholls, 1983) have also noted its usefulness for indicating areas for improvement. It was observed during the present study that resistance of participants proved useful for identifying learning principles which were being negated or overlooked in current situations and processes. For instance, lecturer resistance to providing students with advance organizers or "focussing-problems" (Figure 5, A3), indicated a need to heighten relevance, provide knowledge of the principles involved and to interrelate these with the personal goals of participants. The lecturer who gains real satisfaction from teaching commitments, may resist participation in organizational, syllabus or administrative activities related to teaching in general. On the other hand for a

counterpart whose satisfactions are career oriented, such participations may appear completely relevant. Each will learn if the principle of participation is honoured by the staff developer, but only if the goals are tailored, at least initially, to the perception of each individual. Pseudo-consultation and pseudo-participation (Nicholls, 1983) are also individualistic. What is perceived as pseudo by one, may be very real and increase the learning of another.

3. Positive Learning Climate.

The third aspect of involvement concerns provision of a positive learning climate (see J1-5, p.76 above). The present study involved insufficient application of those factors of staff development relating to interpersonal relationships that affect the learning potential of participants. Earlier conceptualizations focussed on the affective content of interactions (Rogers, 1969). Emphasis within the new model of implementation utilizes affective components only to the degree to which they can be shown to affect the learning process. A positive learning climate in this sense, not only involves acceptance and encouragement of learners, and respect for their autonomy and independence, but also entails personal interactions directed to facilitating learning and makes demands for specified achievements.

The concept of positive learning climate is based on the ego theory of James (1890) and Freud (1943). It is represented in Lewin's (1936) concept of 'life space', Cattell's (1950) construct of 'the self', and the phenomenological theory of Rogers (1969), Snygg & Combs (1949) involving self concept. In brief, self concept theory is grounded in the premise that all behaviour is determined by and is relevant to the phenomenological world of each individual. That is, how a person behaves is dependent on how he sees the situation and himself at any given time.

Arising from this, symbolic interactionalism is based on the belief that social self and self concept develop in response to the actions and opinions of others as they affect the self. Bates (1971) translated this into exchange theory where status, utility and affect

are commodities, manifest and exchanged between individuals in any social system. The learning climate pertaining during the present study and its effects on facilitation or inhibition of change, may be usefully discussed in the light of these concepts, particularly in relationship to their behavioural manifestations of threat reduction, valuing of participants and awareness of relevance as detailed in Ashcroft (1983, pp85-90).

In the present study Positive Learning Climate may be viewed as a major factor with sensitivity to interaction between the Interdependent Influencing Factors of "Educational Setting" and "Individual Perception" (Figure 5). The responses of individuals to exposure to the same educational setting may be idiosyncratic depending on the past experience of participants and their expectations concerning outcomes of efforts to modify teaching behaviours. Staff development involves personal relationships between staff developers and participants. This is a role relationship based in attitudes, beliefs and expectations concerning status, utility and levels of affect. For example, an attitude of mistrust may reflect a status belief that education department staff are incompetent in academic areas or in teaching practice, and an expectation that proposed outcomes will be irrelevant. Participants' expectation that outcomes will be of limited practical utility, may provide motivation and rationalizations for non attendance. Absence of affect, and neutral feeling tones tend to decrease motivation. A moderate amount of pleasant or unpleasant affect will increase motivation while excessive amounts produce debilitating tension (Hunter, 1974).

As indicated in Figure 9, formal staff development presentations with one exception occupied only two or three hours. These figures disguise the fact that such workshops and seminars typically presented three or four topics by at least two different authorities. In most cases presenters were not available for further contact or consultation except of the most superficial level. The author was the one "constant" in terms of staff development activities throughout the five year term but his was a voluntary, part-time role restricted by a full teaching load, research responsibilities and outsider status. The short

term presentations and limited interpersonal contacts involved in the present study, provided little opportunity to modify initial status, utility or affect perceptions of participants. Motivations remained relatively unchanged as demonstrated by the non-significance of data concerning "Change in attitudes to learners" (Table 2), for all modes of staff development, and "Change in attitudes to personal accountability (Table 6). These two categories provide a measure of participants;

- (a) concern to respond to students' needs and differences, and,
- (b) acceptance of teacher accountability and responsibility for teaching outcomes.

However, attitudinal results do indicate a significant increase in inner directedness for both Inner and Other-directed groups (Table 7). Inner-directedness is defined as a willingness to identify and solve problems as they arise, to seek solutions alone or with others and to use and allow autonomy in self and others (see p.81, above). One explanation is that these two groups of staff perceived interventions as directed at increasing personal autonomy or at least as non-threatening. In particular this explanation is supported by data presented indicating that perceptions of Inner-directedness and autonomy increased significantly for the Inner-directed group when compared with the other two modes (Table 14). This is similarly supported by data concerning attitudes to motivating students (Table 16), and attitudes to student involvement (Table 13), with both categories involving a willingness to share autonomy. That such perceptions alone are inadequate for implementation of behavioural change is supported by the findings of Pascarella and Terenzini (1980) who indicate that in order to improve actual achievement, a positive affective climate needs to be accompanied by effective instructional practices. This is to say, (in terms of the model of implementation proposed herein), that the change strategy should address each specific type of change individually. It is not sufficient just to activate learning principles relevant to attitudes when behaviour changes are the focus. Learning principles applicable to changing attitudes are different from those applicable to changing behaviour. In the present programme many factors operated to reduce the probability of developing a positive learning climate and thus facilitate learning, in the context of concepts outlined above.

In terms of the implementation model proposed for this study, it would appear that Interdependent Influencing Factors including the Change Strategy and Individual Perceptions were not activating the principles of the Learning Process concerned with relevant rewards of status, utility or affect in the Educational Setting. At the same time, constraint of operating within traditional expectations of participants concerning staff development activities restricted the use of more effective instructional practices for the training of staff within those activities.

The developer and most other consultants were outsiders operating from philosophies and disciplines somewhat different from those of participants. Secondly, a large number of participating staff were involved in the project but few were involved in the same staff development course or on the same project at any one time, thus limiting opportunities to mitigate conflicting role perceptions concerning status, utility and affect. Thirdly, the intermittent nature of contacts with even those staff most heavily involved gave little opportunity for meaningful relationships to be established, relationships necessary for the maximizing of learning possibilities and hence change toward criterion learning outcomes. The highest incidence of contacts occurred because of approaches to consultants from Inner-directed group members, particularly those with senior status. The effect of this increased participation is reflected in the high attitude gains of that group. These gains are not however carried over into knowledge or behaviour, adding support to the finding of Pascarella and Terenzini (1980) that a positive affective climate must be accompanied by effective instructional practices if achievement is to result.

Increased contacts were sufficient to affect attitudes but the quantity and quality of contacts concerned with direct instructional practice were insufficient to produce further changes in knowledge or behaviour. The establishing of a positive learning climate that reduces counter productive attitudes and threat to the individual, that demonstrates a valuing of each participant and enables a maximizing of learning principles appears to be impossible or at least extremely

difficult under conditions that pertain for the great majority of similarly constrained traditional staff development programmes.

Examination of the implementation model proposed in Figure 5 and discussed above has indicated that the Interrelated Influencing Factors were not oriented so as to activate learning principles subsumed under Goals, Effects and Involvements. For instance, the educational setting failed to provide clear consistent goals and goal objects. This restricted application of learning principles concerned with relevance and reinforcement. The innovation failed to address the real problems as perceived by participants and this limited application of learning principles concerned with relevance and clarity of objectives. The Change Strategy failed to involve a critical proportion of participants in staff development activities. This reduced activation of learning principles concerned with focussing attention, active participation and a positive learning climate.

The classic problem remains. Without relevant reason, involvement will be minimal. Without involvement change will not take place.

To summarize:

The right attitude to human beings is one which accommodates the importance of the characteristic human endowment of reason, not merely by acknowledging his presence, but also by fostering its activity.

(Downie, Loudfoot and Telfer, 1974)

CHAPTER 7

CONCLUSIONS AND IMPLICATIONS

OVERVIEW

R.K.Merton points out that empirical research extends the power of theory through examination of neglected facts.

When an existing conceptual scheme commonly applied to a subject-matter does not adequately take these facts into account, research presses insistently for its reformulation. It leads to the introduction of variables which have not been systematically included in the scheme of analysis.

(Merton, 1957, p108)

The present study analysed models used in discussion and research concerning implementation of educational innovation. An important missing variable in the process of implementation was identified, defined and then used systematically to analyse change in tertiary instruction. The critical variable omitted from previous models of implementation but included in this study was the Learning Process.

Criticism of tertiary education has been long standing. It has tended to focus on academic staff and more particularly on their teaching role. Assessment of staff development practices indicated frustration with ineffective implementation methods. Assessment of attitudes toward staff development indicated a fixation on bureaucratic, Other-directed programmes and administrative desire to enforce accountability. There was an apparent lack of appreciation of problems created by the multi-faceted nature of the academic role. Assessment of theory indicated inadequate conceptualization of the generic process controlling instructional innovation.

Endeavours to bring greater effectiveness to tertiary teaching have led to innovation and change in staff development programmes. However, the terms 'process of innovation' and 'process of change' have

been used as if they were clearly defined phenomena obeying finite and commonly understood principles.

The general purpose of the study was to compare and contrast the effectiveness of alternative approaches to staff development based on different aspects of the learning process. More specifically the study can be summarized as an investigation of changes brought about over a five year period relating to Inner-directed group procedures in comparison with those relating to traditional staff development procedures. In particular this study investigated the efficacy of a staff development mode based on small, Inner-directed autonomous groups. The approach involved group identification and solution of problems causing concern to members. Situations were identified where small groups of staff,

- a. had common concerns and operating environments,
- b. identified mutually relevant tasks and problems,
- c. used self reflective and convivial methods, and,
- d. provided mutual criticism and support

It was hypothesized that;

2.1....`Inner-directed staff development contributes significantly to changes in attitudes to instructional behaviour'.

Results of the investigation support this hypothesis not only for the Inner-directed group but also for staff involved in the more traditional or Other-directed mode. This finding led to rejection of the further hypothesis that;

2.2....`Other-directed staff development does not contribute significantly to change in attitudes to instructional behaviour'.

However the hypothesis that;

1.1....`Inner-directed staff development is related to significant change in instructional behaviour', must be rejected on the evidence of this study as all modes of staff development resulted in extremely consistent instructional behaviours. These behaviours were restricted to the 'direct instructional behaviours' (p.132 above) of staff

relating to face-to-face contacts with students. As discussed in the previous chapter these behaviours appear to be closely related to, and to some degree arise from, indirect preparatory activities and interactions with peers. The observation system used to record these direct classroom teaching activities may be criticized on at least two major counts.

Firstly some significant aspects of direct instruction were not addressed by the system. These included such variables as territoriality of lecturers (involving physical distance between teacher and students), the type of visual aids used and their relevance to each segment of instruction, consistency between actual content of sessions and objectives stated for those sessions, and the actual participation levels of observers when a single student or a group of students were recorded as participating.

Secondly the Measure of Learning Potential is used to record the number of five second time segments during which eleven 'performances' and 60 'competencies' are displayed by instructors. It is a quantitative not a qualitative measure. Complex questions are not differentiated from simpler questions. Reinforcing statements of four seconds duration are not differentiated from those of one second. 'On-task' student participation are not differentiated from those that are 'off-task' or trivial. While the Measure of Learning Potential does record strong negations of any learning principle (see Category X, Appendix, p.224), alternative observation systems are necessary if qualitative differences within categories are to be assessed.

The prediction, (in the null hypothesis form), that;
1.2....`There will be no significant difference in the change of knowledge of instructional methods between staff involved in Other-directed staff development when compared with staff involved in Inner-directed staff development', cannot be rejected on the findings of this study.

In essence results indicate that traditional staff development programmes directed at implementation of changes to instruction do make

a difference. They have been shown to affect staff attitudes to instruction significantly but have not been demonstrated as effective in changing knowledge about teaching or in changing instructional behaviour.

In this chapter the findings of the study are first examined in terms of their implications for theory. Secondly, several implications for further research are examined. In the final sections of the chapter practical implications for staff development in tertiary institutions are discussed.

THEORETICAL IMPLICATIONS

Three main aspects of staff development theory were addressed in the current study. These included implementation of specified change, the learning process within implementation and modes of staff development. Each of these aspects will now be considered.

Implementation

In addressing the problem of implementation many factors cloud the issue. Where the objective is to create change, the product of that change is often used as the dependent variable rather than the change itself. Learner achievement may be used as the measure of change in instructional methods rather than assessment being made as to whether changes were in fact implemented. As was done in the present study, it is necessary to conceptualize and quantify the degree of implementation rather than any changes to student learning which may be the result of implementation, other intervening variables, or both.

Fullan and Pomfret (1977) see any implementation study as "concerned with determining the impact of the attempt upon the user system or at least selected components of it." In order to 'determine the impact' of attempts to implement change, a clear specification of the criteria of proposed outcomes is necessary. In specifying criteria, a danger is that behavioural outcomes may be seen as the only valid measure of change. Methods that record behaviours may only tap

mechanical demonstrations of an innovation. In some cases these are maintained only by coercion, personal loyalties or for short term gain. Unless attitudes and knowledge directly relative to behaviours specified as outcome objectives are also assessed, there is little foundation for optimism concerning long term impact of attempts to implement changes in instructional behaviour

A further concern is reliance on measures of more easily accessed indirect variables as indicators of change. The more easily accessed indirect variables are also those more easily changed. Gross (1971), Evans and Scheffler (1974) and Crowther (1972) found that new organizational administrative and resource aspects of teaching roles were easier to implement than new teaching strategies, a finding reflected in results of the present study.

Changes in these adjunct areas generally involve cooperation with others. It appears reasonable to suggest that the greater the involvement with others, the greater the possibilities for behaviour change.

How are the goals and desired outcomes of implementation activities to be decided? Rhodes (1977, p.58) criticizes needs assessments "where staff are asked what developmental activities they need", seeing this as a superficial perception of needs assessment. Any thorough assessment of needs will include measures of attitudes, knowledge and current practice at all levels of an organization and preferably be situation specific to those who are expected to participate. Rhodes (1977) highlights the need for instruments that will supply base line data including measures of actual practice, attitudes and goals.

There are factors involved in implementing change which need to be attended to before final goals are determined. Size and complexity of change must be considered. "Smaller, locally initiated innovations...are possibly the only innovations over which there can be sufficient consensus to ensure rapid implementation and durable

adoption" (Havelock & Huberman, 1977). The greater the complexity, the greater the problems that arise from adaptations of the original innovation. This problem may be clearly illustrated by aspects of the current study where the intended focus on direct instructional behaviour was redirected to adjunct and indirect preparatory activity. While staff development course content was focussed on the ways in which knowledge of objectives could facilitate student learning (and training in the writing of objectives in formats directed to that purpose was given), participants expended effort in the writing of objectives but not in ensuring that students understood the objectives of a particular session. Staff course sessions dealt with provision of both oral and written feedback to students. Data indicate that the degree of oral feedback remained stable over the five year period but staff increased time spent on (and modified the forms of) written feedback. A third example is found in the increased attention participants gave to familiarizing themselves with students' names. Various devices and their successful use were reported to the researcher but the data indicates no significant change in the use of names during instructional situations. It appears that the 'educational context' and participants' individualized perceptions of cause and effect relationships operating within that context contributed to practical adaptations of these principles of learning. Adaptation may be productive and in many cases desirable and necessary if the focus is on the real needs of participants. On the other hand it may subvert the planned change or be unproductive when neither original goals nor the real needs of participants are served. Professional behaviours relating to 'things' may be easier to modify than those relating to people.

Complexity of innovations will affect both the clarity and stability of participants' goal perceptions. Lack of clarity can be associated with difficulties of communication, coordination and decision making as numbers increase and outsiders are involved. This belief is supported by Havelock and Huberman's claim (op.cit. p.17) that participation and self-help were believed by innovation personnel to be the optimum innovation strategy. They conclude that "without consensus, notably at the local level, it is very difficult to

implement the innovation" (p.83). The failure of staff development interventions to implement specified changes in the current study might well be ascribed to lack of goal clarity and stability concerning specific role performances. The generality of goals across an array of topics and the diversity of individual, group and departmental needs determined by the preconceived ideas of contributing staff developers, made it difficult for participants to hold consistent goals. Such confusion resulted in some participants attending to peripheral or non-criterion aspects of the project. Departmental heads initiated and conducted courses more generally related to administration and syllabus modification rather than increases in the effectiveness of instruction. Invited change-agents presented specialist' views on specific topics with little coordination or cooperation between agents. Course content presented within programmes structured for this study covered the full range of the ten 'performances' listed under Figure 7 with the addition of topics arising from departmental, group and individual requests. The diversity of goal perceptions and diversity of outcomes is not being criticized or lamented at this juncture, rather the point is being made that the implementation of criterion behaviours may be critically negated by factors normally beyond the control of staff developers.

A further factor contributing to the lack of implementation in the present study can be attributed to staff perceptions as to the source of some aspects of the project. The role of the researcher both as resource person for curriculum and staff development activities and as a monitor of changes resulting from problem identification and curriculum review exercises (p.2, above) was well understood by participants. That these researcher roles also involved study for a higher degree could be seen by at least some staff as detracting from the reality and utility of the officially stated roles. Furthermore the researcher was seen to represent a department of education and not an officially recognized staff development organization. However, the majority of staff development personnel may also have an involvement and interest that is also only tangential to their primary areas of concern. In universities with no formal provisions for staff development, education faculty staff are often if somewhat reluctantly,

called on to provide training, consultancy and support services. Gaff (1976, p.153) highlights the disproportionately high percentage of educationists involved in staff development. Lanier and Little (1986) identify further implications of the effect of this "low regard afforded education faculty." Judge (1982) also documents the low regard for education faculty and the degree to which other academics reject the vocabulary, processes and research outcomes of educators. "A classic tension has been identified between those with an education focus and staff in arts and sciences based on "fundamental conflicts over economic, political, racial and ideological issues" (Conant, 1963, p.12). The group is criticized for lack of rigour and for a perceived difficulty in adjusting to the norms and expectations of the real academic world (Ducharme & Agne, 1982, p.33). Respected professions are accorded that respect...

because of a validated body of knowledge and skills subscribed to by the profession, passed by means of preparation programs to the inductees and used as the basis for determining entrance to and continuance in the profession.

(Howsam, Corrigan, Denmark & Nash, 1976, p.3)

Even where assistance is sought outside the education faculty, project directors tend to be placed in the role of suspect self proclaimed experts rather than as professional equals and colleagues. This perception of the staff developer's role is being broken down as personnel with careers committed to the area produce quality research with practical results for their peers. As Moore and Hyde (1981) comment, "commitment to staff development that is focussed on specific problems is much different from a commitment to a general scheme for the improvement of instruction." Focus is often on the more easily attained goals of change to organization, methods and resources which distract activity from attempts to improve student learning. It is apparent that staff development problems of the tertiary level are little different from pre-tertiary. The press of low funding, inadequate basis in theory, lack of evaluation, low prestige, sceptical receivers, inability to identify let alone cater for individual and real needs and limited career opportunities apply in both services.

Many of these factors were apparent at different stages during the present study.

Within tertiary staff development, implementers are often a suspect breed, implementation is often a suspect process and what is being implemented is often a suspect product. Even when not suspect in any of these categories, staff development has to compete with an array of ongoing and emergent responsibilities, involvements and concerns. It must take a priority below that afforded the day to day demands of research, lecturing, programme preparation, scholarship and administration. Because of these competing factors and because they determine most changes in human behaviour, application of the principles of learning must be given a degree of priority if effective and efficient servicing of staff development needs is to be achieved.

What controls the effective and efficient servicing of staff development needs? This study, within the list of Influencing Factors presented in Figure 5, has attempted an answer. An answer that creates a further question... 'Who controls the Influencing Factors?' From the perspective of implementing change, the question becomes (to use the words of Figure 5, lines 3 to 6)... "Who controls the Interrelated Influencing Factors that activate the Learning Process to change Innovating System Components?"

In order to approach a solution it is necessary to examine the Influencing Factors and their interrelationships. The Environment embraces all the other factors which may be represented as concentric circles decreasing in size with the Education Setting containing the Change Strategy which in turn contains both Innovation and Individual Perceptions. It is people at the top of the hierarchy represented by Environment and Educational Setting (and the circumstances they create) that determine how, or if, the Learning Process is activated. In practice these would be politicians, vice-chancellors' committees, individual vice-chancellors, administrators and to a lesser degree, deans of faculties. Within universities where formal staff development centres exist, each staff developer may have responsibilities toward four or five hundred staff. With such staff to developer ratios, staff

developers and change-agents have little control of the generic relationship represented in the innermost circle, that of relevance determined by Individual Perceptions of the Innovation. If this is accepted to be a reasonably common situation certain possibilities appear logical. In situations where staff developers are too few in relation to staff numbers to have any overall impact, their priority may need to be that of working with the 'activators'. That is, it may be more productive for staff development personnel to focus energy on policy modifications through close liaison with the power brokers both within and beyond their immediate institution.

In terms of the hierarchy introduced above, the climate and environment for activating change is controlled mainly from the top but it is an original premise of this study that the content of the change to be activated should be determined from the bottom. Even where the ratio of change-agents to staff is reasonable, it may be more productive if developers' attentions were focussed on enabling deans and departmental heads to activate the learning process relating to staff development rather than attempting to meet an expectation that developers should be able to provide all things for all staff.

In this study, attempts to implement change in instructional behaviour involved not just a simple unitary product but the relationship between factors comprising the wider teaching role. This involved indirect preparatory activities, interactive behaviour and direct instructional behaviour. These various factors and the relationships between them also had to change for implementation to occur. Such changes must be quantifiable. To what degree must attitudes and knowledge change before an ultimate change in behaviour is the outcome? The failure of staff development practices used in this study to produce measured changes in either knowledge or behaviour, allows the conclusion that quite marked change in attitudes alone is insufficient for the prediction of other changes.

What were the factors operating to militate against the implementation of change? Is it possible to minimize these in future

staff development interventions? An attempt to answer these questions is based on the construct of 'learning process' used in the present study.

The Learning Process and Relevance

The present study is based on a premise that the learning process is an essential variable of any model of implementation. It has been argued that staff development programmes depend on the application of the principles and process of learning to interactions between staff developers and participants if successful outcomes are to be achieved. It has also been argued that the degree and content of learning relevant for each individual are critical factors in situationally specific change. While hypotheses developed for the study did not address this premise directly and there is no direct data concerning the relationship between the learning process per se and situationally specific change, the model has provided explanatory power and consistency in the analysis of results. One variable has emerged as affecting interrelationships between influencing factors of the model. The concept of relevance has emerged as being central to many aspects of the learning process. What aspects of relevance had critical importance in accounting for success and failure in implementing changes sought in this study?

Relevant Goals

The first aspect pertains to the goals of staff development programmes. The degree to which individuals perceive objectives as relevant to their personal concerns has been shown to have demonstrable effects on learning both in the present study and by previous research (Suchman, 1971; Stone, 1983). Groups and individuals modified project goals in order to satisfy personal perceptions of relevance. When activity was redirected to adjunct outcomes related to planning, resources or methods, changes occurred. That the reasons for such goal displacements may have been the result of a variety of peer and authority pressures to conform is only a further expression of the primacy of goal relevance in the context of this study.

Relevant Effects

A second aspect of relevance in the process of learning pertains to the effects on staff, both real and imagined, of participation in staff development activities. Effects may be intrinsic and intensely personal. They may be extrinsic in the sense of public recognition or pecuniary gain. The relationship between university teaching roles and the university reward systems is often nebulous and serendipitous. The cause and effect relationship of action and reaction, response and reward, shaping and learning can be applied to improve effectiveness of tertiary teaching. Herein lies a dilemma. Who is to determine the allocation of rewards? Students, who are logically end consumers? Staff who participate in a multi-faceted academic role of which teaching is but one responsibility? Administrators whose accountabilities may not include quality of student learning? On what criteria are rewards to be allocated? For what purpose?

Determination of rewards by students, or staff, or administrators causes controversy because of differing vested interests, interpersonal conflicts and lack of knowledge based objectivity. Criteria acceptable to all groups are necessary. The linking of a relevant reward system to both student and staff learning outcomes provides guidelines for determining these criteria. The initial purpose is to change and improve tertiary teaching but this has as its ultimate criteria more effective student learning. The effect on staff of gaining increased rewards needs to be made contingent on changes to those person to person instructional behaviours that result in more effective student learning, if accountability for student learning is seen to be a legitimate aspect of the teaching role.

Relevant Involvements

A third aspect of the effect of relevance on learning relates to staff involvement in staff development. Involvement in selection of goals having personal relevance and involvement in groups whose members perceive common relevancies, are initial requirements providing

necessary but by themselves insufficient bases for implementation. (The present study, in the results of Inner-directed participation, illustrates the outcome of this insufficient basis. Only attitudes and non criterion behaviours changed significantly). Also necessary is involvement of staff in study, education or/and training directed toward personally relevant instructional performances. It is not sufficient to direct training at topics indirectly or even directly related to instructional performance, such as structuring objectives, making audio-visual resources or lecture preparation. These may be useful to some staff, at some stage of their careers under some circumstances. However identification, mastering and application of missing instructional behaviours that directly determine more effective student learning is crucial if staff are to accept accountability for the effectiveness of their teaching. Different instructional skills for increasing learning effectiveness, are relevant for different participants depending on whether students are freshers, undergraduates or postgraduates. New skills are more likely to be accepted as viable and mastered when they are seen to be relevant in terms of rewards, personal goals or group consensus. Traditional modes of staff development, as applied in this study, proved not to be effective for modifying instructional performances. It appears that involvement in individually relevant skills training, based on principles of the learning process, may be critical for implementation of change in tertiary instruction.

Mode of Staff Development

A primary premise of the present study was that mode of staff development programmes affects three aspects of the tertiary teaching role. These include attitudes toward instruction, knowledge of the principles of learning as applied to tertiary teaching, and actual instructional behaviour. Results clearly indicate that different programme modes had different effects on attitudes but were related to only minimal differences in changes to knowledge and instructional behaviour.

The Inner-directed mode of staff development was based on the premise that, 'where those who have to change are also those affected by the benefits (as they define benefits from personal perspectives), the process of learning becomes more probable and implementation more likely' (p.59, this study).

Compared with staff having little or no direct involvement in staff development activities the Inner-directed group made the most significant attitude changes (tables 9-16). This has practical implications for modification of staff attitudes to staff development activities and lends support to the growing body of knowledge concerning involvement of staff in decisions concerned with goal selection, methods of training and reward systems. It was also observed in the study that members of the Inner-directed group in general became sources for change not related to the restricted objectives specified for this project. These two outcomes provide support for the Kemmis and Hughes (1979) model of 'self reflection in a critical community', and the more general findings of Rose and Nyre (1977), Lindquist (1979) and Rose (1977) indicating that ownership, responsibility and accountability should be initiated by and remain vested in nuclear groups.

On the basis of previous research and results of the present study it is apparent that more effective programmes of staff development are not necessarily achieved when initiated and directed within small, autonomous and community referenced groups as defined above (see p.18). The positive attitude changes achieved were initially hypothesized to be precursive to the criteria set for implementation, namely the implementation of specific instructional behaviours. However participants' priorities did change with greater emphasis being placed on autonomy (Inner-directedness), student involvement and motivation and less distracting use was made of audio-visual resources. Despite the use of objectives being strongly promulgated at staff development courses, the Inner-directed group appeared to exercise the autonomy which is a defining characteristic of that mode, by exhibiting a strong negative attitude change toward that topic. These changes provide some

evidence in favour of continuing to use the Inner-directed mode and for further investigation of its effectiveness. Will the greater autonomy pertaining to this mode lead to less conformity in teaching practice and diminished control of teaching practice by administrators? If it is accepted that the criticisms of university teaching practices (detailed in Chapter 1) do exist and are justified, a decrease in conformity and present styles of administrative control may be the price that has to be paid for more effective instruction.

RESEARCH IMPLICATIONS

Some initial hypotheses of the current study were unable to be addressed because of unforeseen results of staff development interventions. It was hypothesized that;

1.3....Change in knowledge does not contribute to significant differences in instructional behaviour.

3.1....Isomorphic change in both attitudes and knowledge contributes to significant change in instructional behaviour.

Because no significant changes resulted for any mode of staff development in relation to the variable of 'knowledge of instructional behaviour' these hypotheses can be neither supported nor rejected. Constraints of using only traditional forms of training applicable to the host faculty, and a questionnaire format which sought information on teaching from an applied knowledge perspective, may have affected results. Comparisons of different training programmes, (still incorporating a common theoretical basis for attitudes, knowledge and behaviour outcomes), will be necessary to obtain adequate information to support or reject the two hypotheses above..

It is important to note that theoretical explanations offered in this chapter to account for the implementation of specified changes to tertiary instructional roles may be applicable only to organizations having similar characteristics to the faculty involved (p.19 above). One of these characteristics relates to group size. Because of the five year term employed in the study it was necessary to compare

relatively small sample sizes in determining whether any interaction effects were present between modes of staff development and behavioural outcomes. Although the sample size was statistically manageable, particularly in comparing combined involved groups with the Low Involvement group, a larger sample would have been used had it been available. Attrition over the five years resulted in less than half the initial number of participants remaining accessible.

Outcomes of the study indicate three major areas for further investigation. In terms of theory, the original model derived for the study requires further analysis and testing to determine the specific parameters essential to each variable within the model. In particular, specific learning principles subsumed by the learning process have to some degree been taken as sine qua non. Influencing Factors require definition not only of structure but also of the processes of interrelationship with other factors. Innovating System Components specified as the essential elements for change require further justification in the context of current staff development theory. Direct testing of the model as a whole rather than the indirect inferential approach applied in this study is necessary.

In terms of methodology the instrument used for assessing knowledge of instructional principles requires further development. There is little doubt that over the period of five years, participants' knowledge of teaching techniques and of instructional contributing and support activities such as testing, marking, preparation and curriculum development underwent change. The indirect, practice-based content of questionnaire items may have been inadequate to capture those changes. A less covert approach may prove more effective, one which includes not only knowledge of learning principles but also covers what have been described in the above discussion as 'adjunct teaching activities'. Information concerning participants' knowledge of learning principles related to testing, evaluation, course preparation and visual aids would have been invaluable in assessing the effectiveness of the different modes of staff development.

In terms of performance outcomes a major field for investigation

is the effect of staff development mode on adjunct teaching behaviours. While the focus of the present study was restricted deliberately to face-to-face forms of instruction, it proved frustrating to have no controlled measures of those areas where change did occur. Identification of conditions influencing those changes remain to be identified and verified in further research.

The definition of an Inner-directed approach to staff development does not logically exclude direct training methods if these are requested or accepted by Inner-directed participants. Further research is necessary to identify acceptable Inner-directed strategies which, when instigated, can be effective in implementing change.

PRACTICAL IMPLICATIONS

Results of the present study have indicated several areas presenting problems for staff development practice at the tertiary level.

The literature reviewed in Chapter 1 is indicative of a concern for improved student learning environments as a legitimate goal for university teaching. Results reported for this study indicate that current staff development modes are not effective in changing instructional performance. Whether the learning principles and behaviours used as criteria are valid is not at issue in this study. Even if those criteria are not valid, other alternatives, when identified and validated can be used. At issue is identification of an effective process for implementing educational change.

The first problem is that of translating the more acceptant attitudes toward instructional behaviour accompanying these modes of staff development into actual observable instructional behaviors vis a vis students. Guidelines have been suggested in the previous discussion for approaches based on determinants of learning which may hold some solution to this difficulty. For instance the direct and public linking of rewards and negative sanctions not only to teaching excellence but also to teaching competence is a necessary corollary for

increasing teacher attention to the direct role of instruction. It has already been noted that these rewards and sanctions are perceived to be under the control of administrators. A clear implication is that any general deficit in teaching quality may be seen as due to ineffective management of the tertiary reward system. Appointment, tenure, progress through salary steps, promotion and public acknowledgement on a fair, consistent and regular basis are avenues for application of a reward system with strong potential for improving university teaching.

Staff developers roles may need to be directed to a different perspective; that of providing specialist advice to administrators concerning the most effective and efficient ways of improving student learning through instructional techniques. The focus may no longer be that which places staff developers in the position of scapegoats for failures of both teaching staff and administrators to act effectively. Rather it necessitates a paradigm where the responsibilities and accountabilities of all three parties (administration, change-agent and instructional staff), are clearly defined. Within this role staff developers will not only need to know and understand the factors determining learning but more importantly, will need to be skilled in their use within development programmes. Whether these programmes should be based on Inner-directed protocols has not been adequately demonstrated by the current study although some evidence has been presented justifying further trialling of the mode.

The second problem is one arising from the degree of autonomy available to university teaching staff. As Imrie (1980) noted, there has been strong opposition from faculty to the setting up of procedures designed to control members of staff that could interfere with the professional autonomy of a conscientious and effective majority. With such autonomy, increasing participation of staff who may be disinterested, threatened or hold different priorities is difficult. Without participation the status quo remains. Solution to the problem of increasing participation is to be found in provision of an extrinsic reward system based on the principles of learning and summarized under the specific rubric of personal relevance outlined previously.

However positive rewards may be insufficient to negate the

intrinsic satisfactions of remaining a non-participant able to direct energy into alternative academic roles. The specification of teaching responsibilities in quantitative terms is not difficult in setting out job descriptions and prescriptions. The practicalities of prescribing teaching quality is in need of further attention but the use of student evaluations of teaching, peer evaluations of instructional effectiveness and specially designed observation systems provide a nucleus of techniques. Such techniques may be viewed as both summative and formative evaluation systems when applied to the provision of evidence relating to both teaching competence and teaching excellence.

A third problem to be addressed is that of mounting staff development activities in the Inner-directed mode. Staff developers are faced on the one hand with expectations of their expertise and traditional 'other-directed' methods while on the other hand there is the difficulty inherent in identifying groups and individuals for whom the potentially beneficial processes are relevant. One implication at the macro level is that selection and appointment of personnel for staff development careers may be based more suitably on criteria relating to effectiveness in interpersonal relationships with upper management, experience in educational innovation of an administrative nature and public relations both internal and external to the organization. At the micro level as attitudes change and new knowledge is generated, dissatisfactions with existing instructional skills emerge and may be identified by participants. Again the solution may be based more profitably in an application of learning principles rather than recourse to traditional forms of training. Once identified, appropriate staff development activities can be engaged in. The difference between this and traditional forms of training is twofold. It is based firstly in the use of Inner-directed processes for identifying relevant objectives and secondly on the willingness of staff developers to accept objectives so identified as having absolute priority for staff development support programmes.

Further testing of the constructs developed in this study are necessary to determine their value not only for tertiary teaching, and

for participating staff but also for the ultimate beneficiaries, university students. Only when action is taken which integrates effective implementation, the learning process and Inner-directed modes of staff development can the model established by this study be fully assessed.

If staff development practices are to be significantly better they will have to be significantly different.

Tertiary Teaching Research Project - Interview Schedule

CRITICAL INCIDENTS

What is your field of interest?

A. Effective Incident

1. "Think about your teaching this term"
"Can you recall a particularly good teaching session. One that you felt went particularly well?"
2. "Was there anything that you did prior to the session that contributed to its success?"
3. "How did you use this during the teaching session?"
4. "What effect did this have?"
5. "Has this changed your subsequent teaching?"

B. Ineffective Incident

6. "That sounds really interesting. Its not always that satisfying:.
"Can you recall any recent teaching session that was fairly disastrous?"
7. "Was there anything that helped cause the disaster?"
8. "What did you actually do during the session?"
9. "Exactly what effect did this have?"
10. "Has this had any effect on your teaching since?"

C. Perceived Future-action factors

11. "How effective is tertiary teaching at present?"
12. "What factors prevent you being a better teacher?"
13. "What do you think needs to be done?"

Optional (if not raised) "Do you think there is a need for some sort of academic staff training?"

14. "If staff training is offered what sort of thing would you like to see included?"

Massey University



Tertiary Teaching Research

PURPOSE

The purpose of this questionnaire is to obtain information that will help University Teachers to match their teaching techniques and resources to the needs of students.

In order to gain accurate information concerning teaching practices at University we need your assistance. PLEASE give every question careful thought.

THE QUESTIONNAIRE WILL TAKE ABOUT 15–30 MINUTES TO COMPLETE

CONFIDENTIALITY

The questionnaire forms part of a wider study of tertiary teaching patterns.
The project supervisor will be the only person able to link your answers with your name. The coding system used will not be made available to any other person. No information that could be identified with any individual, will be published or made available to any party.

Page One

DIRECTIONS:

EITHER: Please tick the supplied alternative that best represents your answer:

Example

Indicate the University you attended in 1978.

None *Lincoln* *Massey* *Waikato* *Other*

OR: Where a personalised reply is necessary PRINT your answer in the box provided.

Example

Age years

Last secondary school attended?

Bunnythorpe Grammar School

Please print your name as indicated.

	Title	Initials	Name
eg:	Dr	T.C.	Moldown

When you finish this questionnaire please tear PAGE ONE from the booklet and pass/or post BOTH booklet and page one to the project supervisor.

YOUR COOPERATION IN COMPLETING THIS BOOKLET WILL BE APPRECIATED

(PLEASE CUT OFF WHERE INDICATED)

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1. Status

- Lab Assistant
- Tutor
- Demonstrator
- Junior Lecturer
- Lecturer
- Senior Lecturer
- Reader
- Professor

-
- 1
- 2
-
- 4

2. Sex Male Female

-
- 5

3. Age (please tick one)

- less than 25
- 26 - 30
- 31 - 35
- 36 - 40
- 41 - 50
- over 50

-
- 6

4. Your Department this year

-
- 7

5. Length of UNIVERSITY teaching service

- 0 - 1 years
- 1 - 2 years
- 3 - 5 years
- 6 - 10 years
- 11 - 15 years
- over 15 years

-
- 8

6. Length of TOTAL Teaching service

- 0 - 1 years
- 1 - 2 years
- 3 - 5 years
- 6 - 10 years
- 11 - 15 years
- over 15 years

-
- 9

Office Use Only

7. Please tick the following teacher training experience you have received

- None
- Primary School trained
- Secondary Teachers College
- Armed Forces Instructor Training
- University Training Courses – 1 week or more
- Other teacher training (please specify)

8

8. Did you teach a course(s) last year?

- Yes No

11

9. If you answered yes, list the papers you taught; estimate the length of the course (eg: normal university year, half year, term, half term. Do not list courses of a duration less than 5 weeks), and the number of contact hours per week in which you were involved in teaching.

e.g.

CODE	SUBJECT	LENGTH OF COURSE	CONTACT HOURS PER WEEK
36.131	Learning and Teaching	1 year	5

12
 17
 19
 24
 26
 31
 33
 38
 40
 45
 47
 52

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Only

Identify Code Word

10. In your opinion how important is it that students should be clearly aware of your objectives before each lecture?

<i>Vital</i>	<i>Very Important</i>	<i>Important</i>	<i>Not Very Important</i>	<i>Slight Importance</i>	<i>No Importance</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

55

11. How much training have you had in specifying objectives for teaching purposes?

<i>A Great Deal</i>	<i>Quite a lot</i>	<i>Sufficient</i>	<i>Insufficient</i>	<i>Very Little</i>	<i>None</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

56

12. How competent do you feel in writing objectives that will enable your students to study more effectively?

<i>Completely Confident</i>	<i>Quite Confident</i>	<i>Confident</i>	<i>Fairly Confident</i>	<i>Not Really Confident</i>	<i>Incompetent</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

57

13. How important is it that students should see the personal relevance of what they have to study?

<i>Vitaly Important</i>	<i>Very Important</i>	<i>Important</i>	<i>Of Some Importance</i>	<i>Slight Importance</i>	<i>Unimportant</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

58

14. In your opinion is it more important for University teaching to be (A) exciting, challenging and interesting OR for it to be (B) up-to-date detailed and accurately informative?

<i>Strongly A</i>	<i>Rather more A than B</i>	<i>Both of Equal Importance</i>	<i>Rather more B than A</i>	<i>Strongly B</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

59

15. Did you test students last year mainly for ranking purposes or for informing them of their strengths & weaknesses?

<i>Only For Ranking</i>	<i>Mainly For Ranking</i>	<i>More For Ranking</i>	<i>More For Indicating Strengths & Weaknesses</i>	<i>Mainly For Indicating Strengths & Weaknesses</i>	<i>Only For Indicating Strengths & Weaknesses</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

60

16. Name the paper you most enjoyed teaching last year.

61

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17. If in question 16 you named a paper please indicate below how long you have taught it.

- Less than 1 year
- 1 - 2 years
- 3 - 5 years
- 6 - 8 years
- 9 and over

62

18. List the most pleasing things about teaching that paper.

- A. _____

- B. _____

63

65

19. In your opinion, to what degree should students learn and practice skills in reasonably realistic situations?

- Essential* *Highly Necessary* *Necessary* *Unnecessary* *Completely Unnecessary*

67

20. Name the paper you found most frustrating to teach last year.

68

21. If in question 20 you named a paper please indicate below how long you have taught it.

- Less than 1 year
- 1 - 2 years
- 3 - 5 years
- 6 - 8 years
- 9 and over

69

22. List the most frustrating things about that paper, if applicable.

- A. _____

- B. _____

70

72

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23. In your view, what proportion of your students felt that the papers you taught last year were really relevant to their vocational or educational needs?

<i>All</i>	<i>Most</i>	<i>More Than Half</i>	<i>About Half</i>	<i>Less Than Half</i>	<i>None</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

74

24. To what degree do you feel you were able to make last year's study relevant for your students?

<i>Extremely Relevant</i>	<i>Very Relevant</i>	<i>O.K.</i>	<i>Of Some Relevance</i>	<i>Slight Relevance</i>	<i>Irrelevant</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

75

25. How many of last year's papers did you generally enjoy teaching? (Please tick)

0	<input type="checkbox"/>
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>
5	<input type="checkbox"/>

76

26. How many of last year's papers did you generally not enjoy teaching? (Please tick)

0	<input type="checkbox"/>
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>
5	<input type="checkbox"/>

77

27. In your view what proportion of your students felt that the papers you taught last year were largely irrelevant to their vocational or educational needs?

<i>All</i>	<i>Most</i>	<i>More Than Half</i>	<i>About Half</i>	<i>Less Than Half</i>	<i>None</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

78

80

Card One

28. Indicate the extent to which your students participated in each of the following by placing one tick in each bracket.

a. Asking Questions.

<i>Always</i>	<i>Very Regularly</i>	<i>Frequently</i>	<i>Occasionally</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

b. Joining in discussions.

<i>Always</i>	<i>Very Regularly</i>	<i>Frequently</i>	<i>Occasionally</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

c. Presenting their own ideas.

<i>Always</i>	<i>Very Regularly</i>	<i>Frequently</i>	<i>Occasionally</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

d. Leading a seminar.

<i>Always</i>	<i>Very Regularly</i>	<i>Frequently</i>	<i>Occasionally</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

e. Student use of audio-visual aids.

<i>Always</i>	<i>Very Regularly</i>	<i>Frequently</i>	<i>Occasionally</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

f. Extended their study beyond course requirements because they were very interested.

<i>Always</i>	<i>Very Regularly</i>	<i>Frequently</i>	<i>Occasionally</i>	<i>Very Seldom</i>	<i>Never</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

g. Sought you out to discuss ideas they were interested in or unsure of.

<i>Always</i>	<i>Very Regularly</i>	<i>Frequently</i>	<i>Occasionally</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

h. Attempted to solve practical problems in group situations.

<i>Always</i>	<i>Very Regularly</i>	<i>Frequently</i>	<i>Occasionally</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

36. At the beginning of last year, to what extent did you give your students an overall description of the course you were going to teach?

<i>In All Possible Courses</i>	<i>In Most Courses</i>	<i>In Some Courses</i>	<i>In A Few Courses</i>	<i>In Very Few Courses</i>	<i>In No Courses</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Office Use Only

1

2

4

5

6

7

8

9

10

11

12

Office Use Only

37. Did you ensure that the goals of the papers you taught last year were made clear to your students?

<i>In All Papers</i>	<i>In Most Papers</i>	<i>More Than Half</i>	<i>About Half</i>	<i>Less Than Half</i>	<i>None</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13

38. How confident are you that your examination questions were related to your lecture content?

<i>Completely Confident</i>	<i>Almost Completely</i>	<i>Reasonably Confident</i>	<i>Not Certain</i>	<i>Not Confident</i>	<i>Quite Unrelated</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14

39. List all the teaching methods you can.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

15

17

19

21

23

25

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29

31

33

Now, List, (in order of frequency of use), the teaching methods you actually used last year.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

35

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42

43

44

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40. From the above list write down the teaching methods you most prefer.

i. _____

ii. _____

45

47

41. This time write down 2 teaching methods you least like using.

i. _____

ii. _____

49

51

42. List any teaching aids that you regularly used last year during Lectures and Tutorials.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

53

55

57

59

61

63

65

67

43. How often were you able to supply "set readings" for your students last year? (This covers essential reading materials not included in text books.)

<i>Always</i>	<i>Mostly</i>	<i>Sometimes</i>	<i>Seldom</i>	<i>Never</i>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

69

44. To your knowledge how long did your students have to wait for library articles recommended by you as essential for their study?

<i>Not All All</i>	<i>One Day</i>	<i>Up To 1 Week</i>	<i>2 - 3 Weeks</i>	<i>Eventually Unobtainable</i>	<i>Over A Month</i>	<i>Not Applicable</i>	<i>I don't Know</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

70

45. What proportion of your students did you know by name by the end of last year?

<i>All</i>	<i>Most</i>	<i>About Half</i>	<i>Less Than Half</i>	<i>One Or Two</i>	<i>None</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

71

46. At the beginning of each lecture or group of lectures did you advise students of your specific objectives?

<i>All The Time</i>	<i>More Than Half</i>	<i>About Half The Time</i>	<i>Less Than Half</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

72

47. Before each field trip or laboratory exercise were your objectives clearly explained to your students?

<i>Always</i>	<i>Usually</i>	<i>About Half The Time</i>	<i>Less Than Half</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Only

73

48. In last year's lectures, were the important and relevant ideas from previous study revised before new topics were introduced?

<i>Always</i>	<i>Usually</i>	<i>About Half The Time</i>	<i>Less Than Half</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

74

49. To what extent were you able to use the interests and experiences of your students during your teaching last year?

<i>All The Time</i>	<i>More Than Half</i>	<i>About Half The Time</i>	<i>Less Than Half</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

76

50. Last year, how often were you able to frame your lectures or tutorials around problems or problem situations?

<i>Constantly</i>	<i>Very Frequently</i>	<i>Frequently</i>	<i>Occasionally</i>	<i>Infrequently</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

77

51. Last year how regularly were you able to write helpful comments on student assignments?

<i>All The Time</i>	<i>More Than Half</i>	<i>About Half The Time</i>	<i>Less Than Half</i>	<i>Very Seldom</i>	<i>Never</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

78

52. On the average how long was it before you were able to return marked assignments?

<i>1 Week Or Less</i>	<i>2 Weeks</i>	<i>3 Weeks</i>	<i>4 Weeks</i>	<i>6 Weeks</i>	<i>8 Weeks</i>	<i>Longer</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

79

80

Card Two

53. List those things which tended to distract your students during lectures and tutorials last year.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

54. I feel that the statement circled below indicates the proportion of students who adequately understand what I have taught during my lectures.

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <i>All</i> | <i>Most</i> | <i>About
Half</i> | <i>Only A
Few</i> | <i>None</i> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

55. Briefly outline any rewards or incentives you used to increase student motivation last year.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

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1

2

4

6

8

10

12

14

16

18

20

22

24

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27

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31

33

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37

39

41

43

56. Please tick the methods of student assessment which you used last year.

- a. End of year examination
- b. Essay type questions
- c. Written assignments
- d. Practical assignments
- e. Tests of lab. procedures
- f. Short answer questions
- g. "True" or "False" questions
- h. Multiple Choice answers
- i. "open Book" Tests or exams
- j. Student selection assignments
- k. Mastery tests
- l. Oral examinations
- m. Other (please specify in space provided) _____

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<input type="checkbox"/>
45
<input type="checkbox"/>
46
<input type="checkbox"/>
47
<input type="checkbox"/>
48
<input type="checkbox"/>
49
<input type="checkbox"/>
50
<input type="checkbox"/>
51
<input type="checkbox"/>
52
<input type="checkbox"/>
53
<input type="checkbox"/>
54
<input type="checkbox"/>
55
<input type="checkbox"/>
56
<input type="checkbox"/>
57

THANK YOU FOR YOUR COOPERATION

APPENDIX CTERTIARY TEACHING RESEARCH PROJECT

THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE SMALL GROUPS THAT HAVE BEEN INVOLVED IN COURSE CHANGES, MORE SPECIFICALLY THOSE GROUPS WHOSE ACTIVITIES HAVE ALSO BEEN DIRECTED TOWARD SOME PERSONAL PROFESSIONAL DEVELOPMENT OF STAFF.

DURING THE PAST 7-8 YEARS, MANY LONG-TERM, ON-GOING ACTIVITIES HAVE BROUGHT ABOUT CHANGES IN THE FACULTY. MANY PROBLEMS HAVE BEEN IDENTIFIED AND SOLUTIONS SOUGHT. SOME OF THESE SOLUTIONS HAVE BEEN BROUGHT ABOUT BY SMALL SELF DIRECTED GROUPS WORKING TO IMPROVE CURRICULA, METHODS, RESOURCES AND ORGANIZATION OF DEGREES, DIPLOMAS OR PAPERS.

OUTCOMES HAVE BEEN NOT ONLY CHANGES IN DEGREES AND DEPARTMENTS, BUT ALSO CHANGES IN ATTITUDES, KNOWLEDGE AND SKILLS OF STAFF. IF, IN THE PAST 7-8 YEARS, YOU HAVE BEEN INVOLVED IN ANY OF THESE GROUPS, NOT ONLY TO SERVE DEPARTMENT OR FACULTY NEEDS, BUT ALSO TO TRY AND INCREASE YOUR PERSONAL KNOWLEDGE OR SKILLS, PLEASE CIRCLE "YES".

YES

NO

IF YOU CIRCLED "YES", PLEASE LIST BELOW THE OTHER MEMBERS WITH WHOM YOU WORKED CLOSELY IN THE PERSONAL DEVELOPMENT ASPECTS OF THE GROUPS ACTIVITIES.

THIS INFORMATION WILL BE KEPT STRICTLY CONFIDENTIAL. IT WILL ONLY BE USED TO GROUP STAFF FOR RESEARCH PURPOSES. PLEASE RETURN YOUR FORM IN THE ENVELOPE ENCLOSED.

THANK YOU FOR YOUR HELP.

ERIC ASHCROFT

THE DETERMINANTS OF LEARNING

(SECTION 3)

A MEASURE OF LEARNING POTENTIAL

A MEASURE OF LEARNING POTENTIAL

OVERVIEW

A A Guide To Instruction

1. The Determinants of Learning is an integration of 10 factors that control learning.
2. Each factors is defined by a list of criterion competencies.
3. These criterion competencies are translated for use in practical situations by lists of contributing skills.
4. Taken as a whole, the programme is a useful integration of the theory and practice of Educational Psychology for instructor training.

B A Measure Of Learning Potential

1. The 10 factors are grouped into three essential cycles involved in learning.
(Orientation - Instruction - Involvement).
2. The amount of instructor time spent on each of these cycles is recorded, (together with time taken for neutral informing), on a Sequential Record form.
3. The total time spent on each cycle, each performance and each criterion competency is recorded in the Summary Matrix.
4. Ratios between the various cycles indicate areas that may require attention.

C Three Levels Of Analysis

1. Coding by 3 cycles and Neutral Informing is a useful introductory method. Reference to the 10 learning factors is essential for decision making..
2. Coding by the 10 Determinants of Learning and Neutral Informing provides more accurate results. Reference to the Criterion Competencies is necessary.
3. Coding by the 60 Criterion Competencies enables a detailed analysis to be made of any type of instruction.

DETERMINANTS OF LEARNING

A MEASURE OF LEARNING POTENTIAL

During supervision of trainee instructors or teacher trainees carrying out teaching duties in schools or in vocational institutions, the prime concern should be with trainee ability to create learning.

Most classroom interaction analysis systems are concerned with analysis of teacher behaviour and student behaviour. These systems are in general used, together with principles derived from educational psychology, to determine paths of action for trainers, instructors and teachers. It is only by focussing on factors known to have a direct effect on learning, that classroom interaction analysis, can provide information, directly relevant to improvement in teaching techniques.

To take a simple example, research evidence is quite clear as to the effects that "knowledge of objectives" can have on learning. The work by Mager and McCann (1961) has shown that where students were given objectives and the form in which the objectives were to be tested, the time needed for learning was reduced by two thirds. The key factor here of course is that learning is more efficiently carried out when the learners are very clear in their minds as to what it is that they have to learn. Any interaction analysis system that can give a teacher or an instructor clear cut evidence concerning his handling of objectives can point the way to an improvement in instructing techniques.

In similar vein it is known that behaviour is changed by its consequences. In the practical classroom situation this simply means that where an instructor uses appropriate reinforcers or rewards for correct learning behaviour, that learning behaviour will occur with greater regularity, and learning will be encouraged. Instructors who analyse their own teaching behaviours and find

that they use very few reinforcers for their students will improve the learning potential of instructional periods by increasing the number of reinforcers they provide to their learners.

The Determinants of Learning System outlined previously is the basis of "A Measure of Learning Potential". Ten major factors which are known to directly effect learning are the basis of the Determinants of Learning. These in turn have been used to create a system which allows instructors either to measure the quality of learning potential created by their instruction, or to analyse quite objectively the teaching behaviour of teacher trainees so that useful guidance directed towards increasing learning can be given.

The rationale of the system is quite simple. It is based on 3 cycles of instruction; the Orientation Cycle, Instructional Cycle and Involvement Cycle plus a "Neutral Informing" category.

Given very high motivation and exactly right level of entering behaviour, a student may learn from Neutral Informing by an instructor. It is much more likely that he will simply hear the information and in a very short time it will pass from memory. On the other hand where the correct degree of Orientation is employed before the Instructional Cycle is put into operation and the learner is actively involved in the learning act, there is higher probability learning will occur.

This system "A Measure of Learning Potential based on the Determinants of Learning", allows instructors to examine:

1. the ratio between Orientation and the amount of Instruction and Involvement that trainees received and,
2. the ratio between Neutral Informing and Instruction or Involvement.

If we analyse a lesson and find that 90% of the time was used in Neutral Informing and only 10% of the time in Instruction and Involvement, we can be quite sure that the instructional period was relatively ineffective. On the other hand, if we discover in analysing instruction that about 10% of time went to orienting learners to the expected learning outcomes, 10% to Organisational and Neutral Informing activity and the balance of time (80%) was spread over Instruction and Involvement in about equal parts, we can be reasonably sure that the learning potential created by the instructor has been quite high.

THREE LEVELS OF ANALYSIS

LEVEL ONE

To make an introduction to this coding system more simple for instructors who have not carried out classroom interaction analysis previously, the "Determinants of Learning - Measure of Learning Potential", has been divided into 3 stages. The first stage involves categorising instructor behaviours under one of four cycles; Orientation, Instruction, Involvement and Neutral Informing. The problem with this simplified system is that the categorisation of instructor behaviours may not be sufficiently specific. However, it does give a useful indication of the balances and imbalances, the weightings and the complete omissions involved in instructor behaviour.

LEVEL TWO

At the second level, only the 10 Determinants of Learning categories plus Neutral Informing are utilized. The observer will, within the Orientation Cycle be assessing whether there is a POSITIVE LEARNING CLIMATE, whether Objectives are being UNDERSTOOD or seen as RELEVANT by the trainees, and whether OPTIMAL AROUSAL is being carried out. He will also be examining

within the Instruction Cycle, whether the instructor is giving MULTIPLE EXAMPLES of concepts and principles, providing FEEDBACK to the trainees or REINFORCING correct learning behaviour. Finally, from the point of view of the Involvement Cycle, instructors will be assessing whether trainees are PARTICIPATING ACTIVELY whether a RANGE OF SENSES are being used in the learning act and whether trainee ATTENTION IS BEING FOCUSED.

These of course are the 10 Determinants of Learning. Observers will also be assessing those aspects of instructor behaviour which are only Neutral Informing, that is information given only once, organisational information or behaviour, simple neutral sociation and silence or confusion.

LEVEL THREE

At its most effective level the system uses the full sets of criterion competencies which define each of the 11 instructor performances mentioned in the previous paragraph. This involves 60 quite specific variables. For instance if you refer to page 92 you will see that "feedback being provided" involves 3 criterion competencies;

- a. indicating correctness and reasons;
- b. giving usable feedback;
- c. reviewing key ideas.

Each of the other 10 factors or instructor performances involves between 4 and 7 criterion competencies. The 3rd level of coding involves using these 60 criterion competencies to allow an instructor trainer to analyse exactly which competencies are lacking, either in his own instruction or in the teaching of students under his care.

It is recommended that any instructor who has not previously carried out interaction analysis, first become competent and confident in using the first level of analysis: (that involving the 3 cycles and the

Neutral Informing category). At the same time they should be justifying their categorisation of instructor behaviour in one of the cycles by using the 11 performances as criteria for whether that instructor behaviour belongs in a specific cycle or in another.

At the 2nd level of observing, observers should use criterion competencies to justify categorization of instructor behaviour under any particular performance.

It is only by using the full system at the 3rd level that each aspect of an instructor's behaviour is precisely evaluated + categorized. The results may then be used to provide very specific data concerning the learning potential created.

SEQUENTIAL RECORD

The Sequential Record is a form on which are listed the Cycles, Instructor Performances, and the letters identifying each of those performances. This form also presents one minute blocks of time divided into 5 second units. Each row of Sequential Record allows for five minutes of classroom or workshop interaction.

DETERMINANTS OF LEARNING

SEQUENTIAL RECORD

PAGE _____

NAME _____

PAGES USED _____

PLACE _____

DATE _____

RECORDED BY _____

		minute 1					minute 2					minute 3					minute 4					minute 5																																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I																																																											
	RANGE OF SENSES	H																																																											
	ACTIVE PARTICIPATION	G																																																											
INSTRUCTION CYCLE	REINFORCEMENT	E																																																											
	FEEDBACK	D																																																											
	MULTIPLE EXAMPLES	F																																																											
	NEUTRAL INFORMING	N																																																											
ORIENTATION CYCLE	OPTIMAL AROUSAL	C																																																											
	OBJECTIVES SEEN AS RELEVANT	B																																																											
	OBJECTIVES UNDERSTOOD	A																																																											
	POSITIVE LEARNING CLIMATE	J																																																											
KEY INCIDENTS																																																													

LEVEL 1 CODING

PAGE 1
PAGES USED 6

DETERMINANTS OF LEARNING
SEQUENTIAL RECORD

NAME CHOK CHAN WAH
PLACE KPVI
DATE 1/4/82
RECORDED BY [Signature]

		minute 1			minute 2			minute 3			minute 4			minute 5		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I														
	RANGE OF SENSES	H														
	ACTIVE PARTICIPATION	G														
INSTRUCTION CYCLE	REINFORCEMENT	E														
	FEEDBACK	D														
	MULTIPLE EXAMPLES	F														
	NEUTRAL INFORMING	H														
ORIENTATION CYCLE	OPTIMAL AROUSAL	C														
	OBJECTIVES SEEN AS RELEVANT	B														
	OBJECTIVES UNDERSTOOD	A														
	POSITIVE LEARNING CLIMATE	J														
KEY INCIDENTS		OHP →												Obd. Headings		

		minute 6			minute 7			minute 8			minute 9			minute 10		
		61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I														
	RANGE OF SENSES	H														
	ACTIVE PARTICIPATION	G														
INSTRUCTION CYCLE	REINFORCEMENT	E														
	FEEDBACK	D														
	MULTIPLE EXAMPLES	F														
	NEUTRAL INFORMING	H														
ORIENTATION CYCLE	OPTIMAL AROUSAL	C														
	OBJECTIVES SEEN AS RELEVANT	B														
	OBJECTIVES UNDERSTOOD	A														
	POSITIVE LEARNING CLIMATE	J														
KEY INCIDENTS		OHP →												Junic!		

LEVEL 2 CODING (Same episode as above)

		minute 1			minute 2			minute 3			minute 4			minute 5		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I														
	RANGE OF SENSES	H														
	ACTIVE PARTICIPATION	G														
INSTRUCTION CYCLE	REINFORCEMENT	E														
	FEEDBACK	D														
	MULTIPLE EXAMPLES	F														
	NEUTRAL INFORMING	H														
ORIENTATION CYCLE	OPTIMAL AROUSAL	C														
	OBJECTIVES SEEN AS RELEVANT	B														
	OBJECTIVES UNDERSTOOD	A														
	POSITIVE LEARNING CLIMATE	J														
KEY INCIDENTS		OHP →												Obd. Headings →		

		minute 6			minute 7			minute 8			minute 9			minute 10		
		61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I														
	RANGE OF SENSES	H														
	ACTIVE PARTICIPATION	G														
INSTRUCTION CYCLE	REINFORCEMENT	E														
	FEEDBACK	D														
	MULTIPLE EXAMPLES	F														
	NEUTRAL INFORMING	H														
ORIENTATION CYCLE	OPTIMAL AROUSAL	C														
	OBJECTIVES SEEN AS RELEVANT	B														
	OBJECTIVES UNDERSTOOD	A														
	POSITIVE LEARNING CLIMATE	J														
KEY INCIDENTS		OHP →												Junic!		

The 11 teacher or instructor performances are arranged in a suitable order for recording the quality of learning potential being created. At the bottom of the form are listed the performances of the Orientation Cycle. Normally an instructor will then move into the Neutral Informing category above, possibly giving organizational information or carrying out neutral sociation. From that stage, we would expect that full instruction take place together with active participation or involvement of students. As the Sequential Record builds up it becomes evident as to where instructor emphasis lies.

Coding is carried out by closely observing the instructor for 5 seconds and then making a decision as to what has been the predominant activity carried out during that 5 seconds of time. The question initially asked would be:

"IS THE INSTRUCTOR ORIENTING HIS TRAINEES TO LEARNING?"

"IS HE INSTRUCTING?"

" IS HE INVOLVING THEM IN LEARNING OR IS HE MERELY CARRYING

NEUTRAL INFORMING?"

Depending on the answer, at the end of the first 5 seconds the observer would tick the appropriate cycle under column 1.

Activities such as saying, "Good morning class", telling a class what they were going to do as against what they are going to learn, or talking to some of the trainees about events going on in the institution, showing friendliness to the students and making comments about how well they had been working would be recorded as ticks in the "Neutral Informing" category. If the instructor tells the class how well they were working, the tick would go under section J of the Orientation Cycle, of which the "Positive Learning Climate" is a part. Even at Level One of observation it is highly probable that both instruction and involvement will occur together. In these cases,

ticks will be placed in both the Involvement Cycle and the Instruction Cycle for the same 5 seconds unit. (See minute 2, block 13-24, Page 133).

The bottom row on the Sequential Record form, (labelled "Key Incidents") is used to note any changes in major activities such as switching on an overhead projector, cleaning a blackboard, changing the students into groups, students beginning workshop practice, interruptions by outside authorities or unusual behaviour patterns by students.

CODING

Coding, using five second blocks, needs to be practiced. Coding does not come naturally. It is useful to have a watch on the table in front of the observer (preferably digital with seconds or with a sweep second hand). Before Sequential Recording is carried out, the instructor should have several practice runs ensuring that he habituates coding by 5 second intervals. Where this 5 second coding sequence is not quite maintained, the next 1 minute block should be commenced at the correct time when the second hand reaches the appropriate position for the beginning of the 2nd minute. Likewise if the instructor is a little behind at the end of 5 minutes, the next block of Sequential Record should be commenced at exactly the beginning of the 6th minute. In this way a check is kept on the accuracy of timing, and coding can be improved.

THE MOST COMMON CODING PATTERNS

It is quite obvious that the most common behaviour in the majority of classrooms is the instructor talking. In most cases, instructor "talking" is concerned with giving information or Neutral Informing. The most common categories used, when the instructor is informing are listed below, for Level One Coding:

<u>INFORMING</u>	N	(Neutral)
Informing and using AVA	N + H	(Neutral plus involvement)
Informing and using examples	F	(Instruction)
Informing and stressing key ideas	F	(Instruction)
Informing as feedback	D	(Instruction)

The second common category of instructor behaviour is asking questions. The more common instructor behaviours involving asking questions are listed below.

<u>ASKS A QUESTION</u>	C	(Orienting)
Asks question and uses name	CC	(Orienting)

A third very common instructor behaviour particularly in the workshop situation is demonstrating. This can occur in classroom lessons or outside in physical education, in workshops and in almost any instructional situation. The table below lists the most common categories.

<u>DEMONSTRATES</u>	F	(Instruction)
Demonstrate and tell	F + N	(Instruction plus Neutral)
Demonstrates using real article	F	
Demonstrates using real article and Informing	F + N	
Demonstrating using trainee's work-piece	D + F	(Instruction)
Feedback on trainee's workpiece	D	(Instruction)

A very common category involves students carrying out workshop tasks, answering questions, working at their desks as a result of teacher instruction or generally actively participating in the work of the classroom. This is coded under the Involvement Cycle, but more accurately in Category G. Category G will include any learner activity which actually carries out a

behaviour associated with the desired learning. Answering a teacher's question, working on the blackboard in front of the class, making a model in a workshop or taking part in a group discussion, will all be classified as Involvement Cycle, and more accurately under G, (Active Participation).

Coding at Level 1 - Summary.

1. Fill in the top administrative sections of the Sequential Record. This includes the page number, the name of the person observed, the place, the date and your name. In the bottom row, "Key Incidents", record the time lesson commences; (9.48 or 12 mins to 10). If the whole of the first minute was spent in organizational activity you would have coded 12 ticks in the row N against Neutral Informing. If the second minute was totally taken up with presenting objectives, then ticks would all be against the Orientation Cycle. If the third minute was completely taken up with giving examples of concepts under study then you would have 12 ticks at 5 second intervals against the Instructional Cycle. If in the fourth minute students were in groups busily discussing the concepts presented, there will be 12 sequential ticks against the Involvement Cycle. Any changes of behaviour or outstanding events would be indicated in the appropriate time slots in the "Key Incidents" row.

DETERMINANTS OF LEARNING

COMMON CODING CATEGORIES

TELLS

GIVES INFORMATION	N1	NEUTRAL
GIVES INFORMATION AND USES <u>AVA</u>	N1 + H1	NEUTRAL
GIVES INFORMATION PLUS <u>EXAMPLES</u>	F2	INSTRUCTION
GIVES INFORMATION <u>STRESSING KEY IDEAS</u>	F1	INSTRUCTION
GIVES INFORMATION AS <u>BRIEF FEEDBACK</u>	D2	INSTRUCTION
GIVES INFORMATION AS <u>REASONED FEEDBACK</u>	D1	INSTRUCTION
FEEDBACK ON <u>TRAINEES WORKPIECE</u>	D1	INSTRUCTION

SHOWS

<u>DEMONSTRATES</u>	F1	INSTRUCTION
DEMONSTRATES AND <u>GIVES INFORMATION</u>	F1 + N1	INSTRUCTION
DEMONSTRATES <u>USING REAL THING</u>	F2	INSTRUCTION
DEMO, <u>WITH REAL THING AND GIVES INFO.</u>	F2 + N1	INSTRUCTION
DEMONSTRATES <u>WITH TRAINEES WORKPIECE</u>	F2 + D1	INSTRUCTION

ASKS

<u>QUESTIONS</u>	C3	ORIENTING
QUESTION PLUS NAME	C3 + C5	ORIENTING
QUESTION (RHETORICAL)	C3	ORIENTING

STUDENT ANSWER

STUDENT <u>DOESN'T ANSWER</u>	G1	INVOLVEMENT
STUDENT <u>WRITES ANSWER</u>	G1	INVOLVEMENT
STUDENT <u>EXPLAINS TO CLASS</u>	G6	INVOLVEMENT
STUDENT <u>ILLUSTRATES ON BLACKBOARD.</u>	G6	INVOLVEMENT

STUDENT ACTIVITY

STUDENT <u>SEAT WORK</u>	G5	INVOLVEMENT
STUDENT <u>WORKSHOP PROJECT</u>	G5	INVOLVEMENT
STUDENT <u>TRIES OUT EQUIPMENT</u>	G4	INVOLVEMENT
STUDENT PRACTICE IN <u>REAL ENVIRONMENT</u>	I4	INVOLVEMENT

INSTRUCTOR ORGANIZING

STATEMENTS	N1	NEUTRAL
BEHAVIOUR	N1	NEUTRAL
MARKING ROLL	N1	NEUTRAL

INSTRUCTOR WARMTH

FRIENDLY BEHAVIOUR	J1	ORIENTING
USES NAME NOT JUST TO IDENTIFY	J3	ORIENTING
TAKES PRESSURE OFF STUDENT	J4	ORIENTING

CODING REFERENCE SHEET

INVOLVEMENT	I	ATTENTION IS FOCUSED AND DISTRACTORS ARE MINIMIZED	<ol style="list-style-type: none"> 1 Eliminating potential sensory distractors 2 Eliminating cognitive distractors 3 Using undirected and directed play 4 Providing for learning and PRACTICE IN THE PERFORMANCE SITUATION 5 Keeping media subordinate to the message 6 Preventing divided attention situations
	II	A RANGE OF SENSES ARE INVOLVED	<ol style="list-style-type: none"> 1 Providing for multi sensory stimulation 2 Interrelating physical, verbal and intellectual activity 3 Ensuring that TRAINEES use a range of media 4 Using simulation activity 5 Providing a RANGE of learning resources
	G	TRAINEES PARTICIPATE ACTIVITY	<ol style="list-style-type: none"> 1 Providing opportunities for trainees to ANSWER , discuss and question 2 Ensuring trainees hypothesize and questions 3 Using trainees relevant ideas and questions 4 Allowing trainees to use equipment themselves 5 Allowing time for useful participation 6 Providing time for trainees to record or explain their ideas
INSTRUCTION	E	CORRECT LEARNING BEHAVIOUR IS REINFORCED	<ol style="list-style-type: none"> 1 Providing regular social REINFORCERS for correct attainments 2 Extinguishing incorrect responses 3 Observing and using individualized reinforcers 4 Requiring demonstration of attainment and reinforcing it 5 Reinforcing "On Task" behaviour
	D	FEEDBACK IS PROVIDED AND USED	<ol style="list-style-type: none"> 1. Indicating correctness of responses objectively and giving reason 2 Giving FEEDBACK as soon as possible 3 Providing ongoing review of key ideas
	F	THERE ARE MULTIPLE EXAMPLES OF CONCEPTS AND PRINCIPLES	<ol style="list-style-type: none"> 1 Providing a range of examples for each concept or principle. SHOWING EXAMPLES 2 Stressing the obvious and DEMONSTRATIONS of key ideas 3 Requiring a range of examples as proof of ongoing understanding 4 Providing time for clarification and consolidation 5 Summarizing and providing a simple overview
NEUTRAL	C	THERE IS OPTIMAL AROUSAL	<ol style="list-style-type: none"> 1 Reactivating relevant past experience 2 Creating curiosity 3 QUESTIONS or involving trainees in problem based activity 4 Using trainees areas of concern 5 Using eye contact and trainees' NAMES 6 Ensuring objectives are attainable in terms of time and difficulty 7 Reducing debilitating anxiety
ORIENTING	B	OBJECTIVES ARE SEEN AS RELEVANT BY THE LEARNER	<ol style="list-style-type: none"> 1 Allowing trainee participation in selection or formulation of goals 2 Framing objectives around trainees' interests and experiences 3 Demonstrating RELEVANCE of objectives 4 Using realistic situations wherever possible 5 Pretesting to establish perception of need
	A	OBJECTIVE ARE UNDERSTOOD	<ol style="list-style-type: none"> 1 STATING OBJECTIVES clearly 2 Discussing objectives with the trainees 3 Providing a simple "focussing problem" 4 Having trainees state or write objective in own words 5 Using behavioural objectives where appropriate 6 Reactivating objectives during learning sequences <ol style="list-style-type: none"> a Stating, discussing and clarifying emergent objectives b Planning and activating "Hidden Agenda Objectives" Methodically
	J	THERE IS A POSITIVE LEARNING CLIMATE	<ol style="list-style-type: none"> 1 Showing the trainee he is valued 2 Spending the time necessary to know each trainee 3 Using NAMES in personal and written interaction 4 Eliminating or reducing counter productive threat 5 Providing time and/or space for "withdrawal"

Coding at Level 2

Level 2 uses the 10 categories A to J listed on page 139. Initially the instructor, (while observing instruction), makes a decision as to which CYCLE is operating. He then locates which CATEGORY is represented within that cycle.

If ORIENTING is taking place, the only options are Categories A, B, C or J.

- A Objectives are understood
- B Objectives are seen as relevant by the learners
- C There is optimal arousal
- J There is a positive learning climate

If INSTRUCTION is taking place, the only options for the observer are Categories D, E or F.

- D Feedback is provided and used
- E Correct learning behaviour is reinforced
- F There are multiple examples of concepts and principles

If INVOLVEMENT is occurring the only options for the observer are Categories G, H or I.

- G Trainees participate actively
- H A range of senses involved
- I Attention is focussed and distractors are minimized

The other remaining alternative is NEUTRAL INFORMING which involves

- 1 "Once only" content information
- 2 Organizational Information
- 3 Neutral Sociation
- 4 Silence
- 5 Confused Activity

Coding at Level 3

Decision Making

Making decisions for level 3 coding is very similar to the decision making process at levels 1 and 2. The CYCLE determines the choice of categories. If you have made the decision that the instructor is operating in the Orienting Cycle, the only categories which are available to you are

- | | |
|------------|--------------------------------------|
| Category A | Objectives are Understood, |
| Category B | Objectives are seen as relevant, |
| Category C | There is optimum arousal, or |
| Category J | There is a positive learning climate |

If behaviour does not fit any of these four categories or is not represented by any of the 23 Criterion Competencies contained in those four categories then you may have made an error concerning the Cycle being operated.

However, if the instructor has mainly asked questions and is allowing trainees to reply, if he then is giving them feedback about their answers or uses their answers to further explain the ideas that he initiated, and these are all directed towards ENSURING THAT OBJECTIVES ARE UNDERSTOOD, then the coding pattern presented above would still apply. (i.e. The observer would be recording almost continuous ticks under Category A, while at the same time showing Categories G and D were operating during the Orienting Cycle).

The Sequential Record above also illustrates another logical rule at level 3. No entries can be made in Categories A to C while Neutral Informing is being entered. It is however possible for an instructor to be developing a Positive Learning Climate intermittently while he carries on almost continuous Neutral Informing.

Decision Sequence

The Sequence of decisions to be made by coders soon becomes habituated. A little practice is needed before this occurs. Following is an example of the Decision Sequence.

Instructor asks, "What is the answer Jim?"

<u>DECISION</u>	"Which CYCLE is Operating?"	(Orienting Cycle)
<u>SEQUENCE</u>	"Which CATEGORY in Orientation is Operating?"	(Arousal Category)
	"What CRITERION COMPETENCY is Displayed?"	(Questioning)

ACTION

Put a 1 in appropriate 5 second box.

Jim replies, "To check for faults in the armature winding".

<u>DECISION</u>	"Which CYCLE is Operating?"	(Involvement Cycle)
<u>SEQUENCE</u>	"Which CATEGORY in "Involvement" is Operating?"	(Active Participation Category)
	"What CRITERION COMPETENCY in the Instruction Cycle?"	(Trainee Answers)

ACTION

Put a 1 in appropriate 5 second box against Category G.

The instructor then says, "First class. That's a very good answer".

<u>DECISION</u>	"Which CYCLE is Operating?"	(Instruction Cycle)
<u>SEQUENCE</u>	"Which CATEGORY in Instruction Cycle?"	(Learning Behaviour Reinforced)
	"What CRITERION COMPETENCY is being Displayed?"	(Social Reinforcers)

ACTION

Put a 1 in appropriate 5 second box, against Category E.

The Coding reference sheet on page 139 provides a simple, somewhat wordy model of the above system. In learning to code it is useful to first look at the left hand column and make a decision as to which CYCLE is operating. (Involvement, Instruction, Neutral or Orienting).

Following this decision, the coder should then examine the CATEGORIES listed in the centre column of the page to determine which of these represents the CYCLE that he has already chosen. Finally, once a decision has been made as to the category, it is necessary to check the Criterion Competencies on the right hand side as a confirmation that the right decision has been made.

In the early stages a coder should not attempt to maintain 5 second coding speed or even observe using a timer. It is best to listen to some instruction for 20 to 30 seconds, make a decision as to the CYCLE operating, check that the decision is represented by an appropriate CATEGORY and then check that the category is represented by appropriate CRITERION COMPETENCIES from the right hand side. Once beginner coders can make those decisions, and find their way around the coding reference sheet on page 139 quite rapidly, then and only then should they put some sort of time constraint on their coding. It will probably be better to begin with 10 second time blocks as an initial time constraint.

WARNING

It is quite wrong to determine the Criterion Competency from the right hand column first and then to proceed to check mark the category cycle. If a coder decided that the teacher or instructor was giving feedback to a student he could quite erroneously decide the MAJOR thing that was occurring was that feedback was being provided - Category D. And that because it was Category D, then it must be Instruction that was taking place.

This of course could be quite wrong. The feedback may only have been about the students understanding of objectives and in fact the instructor may have been concentrating extremely well on the Orienting Cycle, or

orienting learners to understanding the objectives. Once again, the Sequential Record above illustrates this point.

Similarly the instructor may be summarizing and providing a simple overview and the beginner coder may decide because of this, that it must be Category F, (giving multiple examples), and therefore the major thing occurring was Instruction. This again can be quite erroneous. The instructor may in fact have been summarizing and providing a simple overview of the objectives, In that case his MAIN thrust was towards "Objectives being Understood," and the Orienting Cycle was operating, not the Instruction Cycle.

The decision sequence:

- A Decide on CYCLE Operating
 - B Locate the CATEGORY WITHIN THAT CYCLE
 - C Identify the CRITERION COMPETENCY within that Category
- IS INVIOLATE.

The CYCLE is paramount. It determines all decisions concerning CATEGORIES and CRITERION COMPETENCIES.

Multiple Coding

Instructor, trainers and teachers are very busy people. They seldom do one thing at a time. Even short periods of observing will reveal that the instructor is usually talking and showing something, showing something and fixing some trainee with a steely eye, asking a question while writing on the blackboard or pointing to a diagram while operating a working model. But most likely he will be talking or giving instruction while at the same time referring to some visual aid.

While this may cause the novice coder some anxiety in the early stages, coders soon become adept at entering ticks or numbers in two or even three categories in the same 5 second block of time. Reference to the "Common Coding Categories" listed on page 138 will show 5 instances of dual categories being required, to record what appears to be on the surface, a single incident of instruction.

Examples of Dual or Multiple Coding are given in the examples below:

DETERMINANTS OF LEARNING
SEQUENTIAL RECORD

NAME Mr X
PLACE B.T. Sec.
DATE 7.7.83
RECORDED BY E.

LEVEL 1 CODING

		minute 1					minute 2					minute 3					minute 4					minute 5																																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I																																																											
	RANGE OF SENSES	H																																																											
	ACTIVE PARTICIPATION	G																																																											
INSTRUCTION CYCLE	REINFORCEMENT	E																																																											
	FEEDBACK	D																																																											
	MULTIPLE EXAMPLES	F																																																											
	NEUTRAL INFORMING	N																																																											
ORIENTATION CYCLE	OPTIMAL AROUSAL	C																																																											
	OBJECTIVES SEEN AS RELEVANT	B																																																											
	OBJECTIVES UNDERSTOOD	A																																																											
	POSITIVE LEARNING CLIMATE	J																																																											
KEY INCIDENTS		Introduces topic																														Organized groups																													

DETERMINANTS OF LEARNING
SEQUENTIAL RECORD

NAME Mr X
PLACE B.T. Sec.
DATE 7.7.83
RECORDED BY E.

LEVEL 2 CODING

		minute 1					minute 2					minute 3					minute 4					minute 5																																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I																																																											
	RANGE OF SENSES	H																																																											
	ACTIVE PARTICIPATION	G																																																											
INSTRUCTION CYCLE	REINFORCEMENT	E																																																											
	FEEDBACK	D																																																											
	MULTIPLE EXAMPLES	F																																																											
	NEUTRAL INFORMING	N																																																											
ORIENTATION CYCLE	OPTIMAL AROUSAL	C																																																											
	OBJECTIVES SEEN AS RELEVANT	B																																																											
	OBJECTIVES UNDERSTOOD	A																																																											
	POSITIVE LEARNING CLIMATE	J																																																											
KEY INCIDENTS		Introduces topic																														Organized groups																													

LEVEL 3 CODING

DETERMINANTS OF LEARNING
SEQUENTIAL RECORD

NAME Mr X
PLACE S.T. Sec
DATE 7.7.83
RECORDED BY E.

		minute 1												minute 2												minute 3												minute 4												minute 5											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I																																																											
	RANGE OF SENSES	H																																																											
	ACTIVE PARTICIPATION	G																																																											
INSTRUCTION CYCLE	REINFORCEMENT	E																																																											
	FEEDBACK	D																																																											
	MULTIPLE EXAMPLES	F																																																											
ORIENTATION CYCLE	NEUTRAL INFORMING	N																																																											
	OPTIMAL AROUSAL	C																																																											
	OBJECTIVES SEEN AS RELEVANT	B																																																											
	OBJECTIVES UNDERSTOOD	A																																																											
POSITIVE LEARNING CLIMATE		J																																																											
KEY INCIDENTS		Introduces topic.																																				Organised groups																							

It will be seen from the above example of Level 3 coding that where a single category is scored for a long period, it is effective to use a continuous arrow for the 1 minute block rather than entering a number or tick on 12 occasions. In coding at Level 3 the coder will be using numbers and arrows exclusively except for brief periods of extreme pressure.

KEY INCIDENTS

It is useful to recall at this stage that the, "Measure of Learning Potential," is directed at assessing the LEARNING potential being created by an instructional sequence. The numerical data obtained is not the total data upon which decisions are made about any desirable modifications to the instructional procedures. The type of instruction being given requires, in many cases, quite different weightings of Orientation, of Instruction, or of Instruction as against Involvement. Another prime factor in making decisions concerning the quality of the instruction which is taking place are the types of events that occur during the instructional sequence. The bottom row of the Sequential Record, labelled KEY INCIDENTS, is provided for this purpose.

In using the Key Incidents row an observer should note any changes in organizational pattern such as a shift into group work, a shift from instruction to workshop, a shift from instruction to practice or a shift in

the use of the type of audio visual aid being used. The latter will occur when the instructor turns off an overhead projector and refers to the blackboard diagram, or when he takes out an actual model and shows it to the class instead of referring to the diagram on the blackboard. Unusual interactions between students and instructors, or between individuals, to which the observer may wish to refer at a later stage, should be recorded in this row.

Category X

Once coders become competent in using the Measure Of Learning Potential, they often find it useful to record negative examples of the Categories which are all expressed in positive terms. For instance, category I is stated as being when the instructor IS "focussing attention and minimizing distractors," How would you record when there is a serious case of the instructor NOT focussing attention and in fact MAXIMIZES distractors? This can occur when a late-comer enters the room. The instructor instead of ignoring the trainee and carrying on with his lessons, makes such a fuss about the late arrival that the whole learning cycle is disrupted and the class aroused either on the side of the trainee, or the instructor because of the waste of time that occurs. In this type of situation where there is a strong negation of a Determinant of Learning category, observers should use a cross in the category concerned to indicate that negation.

An instructor asks questions, the students reply but the instructor immediately carries on giving further information without providing any feedback. Where the observer notices that this is habitual and the instructor seldom gives any feedback the observer would use the cross symbol X, to note the negation of Category D and to indicate that feedback was NOT BEING PROVIDED. Where trainees show extreme anxiety concerning their ability to produce standards demanded of them by an instructor and the

instructor insists that they immediately begin working on their models, an X would be recorded in the Optimal Arousal category because the instructor is not creating Optimal Arousal. He is not reducing the debilitating anxiety (Criterion Competencies No. 7), and therefore he is negating the Determinant of Learning "C". Having introduced the X character however, it should be noted that this form of recording should be used extremely sparingly, and only when there is SERIOUS NEGATION OF LEARNING PRINCIPLES.

PRACTICE OF COMMON CODING SEQUENCES

Learner coders will find it useful to practice the four following regularly occurring common coding sequences. They involve (a) the most used patterns in the Neutral Informing Category, (b) the interchanges that occur between the instructor and the students, (c) tutoring students while they are involving in workshop practice or in practicing such skills as typing, commercial art or group discussion activities, and (d) the instructor giving information and using audio visual aids of various kinds.

a Neutral Informing Sequences.

Neutral Informing sub-category 1 (Once only content information), is usually easy to code. However, coders must be awake to a change where the initial concept or principle presented by an instructor is illustrated by examples. This involves a shift of coding from the Neutral Informing category to the Instructional field under category F1 or F2. Once the examples have been given coders once again need to be aware that instructors will probably revert rapidly to Neutral Informing, sub-category 1.

Neutral Informing sub-category 2 (Organisational Information), is once again usually easy to code. However, a common miscoding is when instructors tell trainees or students what they are going to DO rather than what they are going to LEARN. Where instructors make the statement, "We are going to examine the 3 types of Heat Pumps in

most common use for refrigeration purposes", they are NOT orienting students to learning but simply giving organizational information.

Neutral Informing sub-category 3, (Neutral Sociation) is concerned with ordinary social interactions taking place in a classroom, having nothing to do with the actual learning desired or planned. It is necessary to note the use of the word "Neutral" in the phrase "Neutral Sociation". Where the sociation is not Neutral but is directed towards encouraging the learner, or developing a positive climate in the classroom then the purposes of learning ARE being served and category J will be utilised.

Neutral Informing sub-category 4, (Silence) is only used to indicate instructor silence not directed to further learning. It would be quite incorrect to use sub-category 4 when an instructor is awaiting an answer. The "wait period" after asking a question, contributes to the quality of learning taking place through instruction. It is the silences where the instructor is searching for the forgotten overhead projector transparencies, or is trying to find the place in a book which he omitted to mark before coming to the classroom or because he has forgotten which part of the lesson comes next. These are instances of when Neutral Informing 4 should be used.

Neutral Informing Sub-category 5, (Confused Activity) is only used to indicate that sort of confused activity which is NOT contributing to learning. Where students are leaving a period of instruction to carry out desk work or workshop practice would not be labelled "confused activity". The most common occurrence is probably when a section of the class have completed work and the instructor is occupied with another group. The group which has completed work may gradually become more and more unruly. The same thing may occur when an instructor is focussing attention on a single student.

b The question, answer, reinforcement, feedback sequence.

This sequence is extremely common, occurring in nearly all instructional episodes, although the reinforcement aspect is often omitted. Quite often the feedback is extremely brief, so much so that both the answer, feedback and the instructor recommencing Neutral Informing may occur within a single 5 second period. In this case there would be 3 entries on the Sequential Record under the same 5 second block of time. This typically involves feedback which is merely a nod of the head, a quick "yes" or "no" or just 1 or 2 words.

It is useful to practice this section in isolation until fluency in coding the sequence is attained. This can be done simply. If you have access to a tape recorder, act as two people by asking a question, giving a reply, giving reinforcement and feedback, giving a couple of sentences of information and then going through the sequence again. Do this for about 5 minutes. Play the tape back and code it. Once this is practiced two or three times trainee coders will soon become skilled in using the sequence.

c Tutoring during practice session.

Referring to the common coding categories listed on page 138, under "Student Activity", shows that category G5 is the most commonly used. While this is being recorded (quite often continuously, over a long period of time), the instructor should also be recorded as he proceeds around the class giving help to individual trainees. The typical pattern is a continuous G5, or if the practice is taken place in the real environment, Category I4 with intermittent bursts where the instructor is demonstrating and giving information F1 + N1 to individual trainees or students.

He may demonstrate using the trainees piece of work. In each case the coding would be as well as G5, also F2 + D1. F2 because the instructor is demonstrating A KEY IDEA, and D1 because he is indicating the correctness of the trainees previous response, even though the response is a practical one.

d Informing and using A.V.A.

Giving information while at the same time using some form of audio-visual apparatus is an extremely common form of instruction. Where the information load is extremely high and remains in the Neutral Informing category for most of the period an instructor should have strong doubts as to its effect on learning. Such giving of information while using AVA is recorded, N1 + H1 and this may quite often be almost continuous throughout the period. Where this pattern is observed to be over-used, practice in converting Neutral Informing into proper instruction of Category D, E and F form, is desirable.

In the early stage of coding practice (before real competency is achieved) novice coders should not be afraid to revert to a lower level of coding when they become pressured. If too much is occurring at one time, or if a coder becomes unsure of which category to use, very little is lost if for a short period of time he simply reverts to coding by "Cycles". Once the necessary mental equilibrium is attained the coder can return to a more demanding level of coding.

SUMMARY MATRIX LEVEL 1

DETERMINANTS OF LEARNING

SUMMARY MATRIX

NAME K. SmithPLACE L.T. Tech.DATE 3/5/83RECORDED E.

PERFORMANCES			CRITERION COMPETENCIES							TOTALS	%	TIME	CYCLE %'s
			1	2	3	4	5	6	7				
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I											
	RANGE OF SENSES	H								596			23.7%
	ACTIVE PARTICIPATION	G								279			
INSTRUCTION CYCLE	REINFORCEMENT	E											
	FEEDBACK	D								229			19.4%
	MULTIPLE EXAMPLES	F											
	NEUTRAL INFORMING	N								511			43.4%
ORIENTATION CYCLE	OPTIMAL AROUSAL	C											
	OBJECTIVES SEEN AS RELEVANT	B								159			13.4%
	OBJECTIVES UNDERSTOOD	A											
	POSITIVE LEARNING CLIMATE	J											
TOTAL EXCLUDING "H"									1178				

SESSION TYPE Workshop TheoryTOTAL
EXCLUDING "H"

REMARKS

Whatever level of coding is used, at the end of the recording the observer will have accumulated a series of either ticks or numbers against each cycle. Level 1 recording is very simple. It involves adding all the ticks against Categories "I" and "G" and recording them in the row "G" of the column labelled "Total" on the Summary Matrix. In a similar way ALL ticks occurring against the Instruction Cycle are entered in the middle box under "Total" against the Instructional Cycle. ALL ticks occurring in Neutral Informing are totalled, and entered, and ticks occurring against the Orientation Cycle are totalled in the centre of the Orientation Cycle row. (N.B. The score for Category "H" is NOT included in the Involvement Cycle total or final total at this stage).

The four summation numbers are then added and entered in the bottom box of the Summary Matrix against the word "Total". (See sample on Page 153).

Calculate the percentage of total 5 second incidents which were occupied by Involvement. If the Involvement incidents are 279 out of the total 1178, the percentage would be 23.7. If the Instruction Cycle occupy 229 incidents out of a total of 1178, the percentage would be 19.4. If Neutral Informing totals 511, the percentage entered in the extreme right hand column would be 43.4 and if the Orientation Cycle totals 159, the percentage would be 13.4.

The only further activity to be undertaken is to complete the form by filling in the "Name", "Place", "Date" and "Recorded" sections and very importantly a record of the session types. This will include whether it was instruction in a classroom, instruction preceding a long period of workshop practice, normal workshop practice, and outdoor instruction sessions, a discussion seminar, a university lecture or student group project work.

SUMMARY MATRIX, LEVEL 2

Use of the Summary Matrix at Level 2 does not use the left hand side of the form but simply the "Total" column. Add all ticks in the Category I row and enter the score in the top box under "Total". Add all ticks occurring against category H and enter them under "Total" in the second box, and so on through Performances or Categories G, E, D, F, N, C, B, A and finally J. Exclude Category H, from the Grand Total recorded in the bottom box. Calculate the remaining 10 percentages, one for each row, excluding row H. If there were only 31 incidents against "Reinforcement" with a grand total of 1178, the percentage would be 2.6.

DETERMINANTS OF LEARNING

Level 2

SUMMARY MATRIX

NAME K Smith
 PLACE L.T. Tech
 DATE 3/5/83
 RECORDED E.

PERFORMANCES

CRITERION COMPETENCIES

			1	2	3	4	5	6	7	TOTALS	%	TIME	CYCLE %'S
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I								0	0		
	RANGE OF SENSES	H								596			23.7%
	ACTIVE PARTICIPATION	G								279	23.7		
INSTRUCTION CYCLE	REINFORCEMENT	E								31	2.6		
	FEEDBACK	D								78	6.6		19.4%
	MULTIPLE EXAMPLES	F								120	10.2		
	NEUTRAL INFORMING	N								511	43.4		43.4%
ORIENTATION CYCLE	OPTIMAL AROUSAL	C								142	12		
	OBJECTIVES SEEN AS RELEVANT	B								8	.7		
	OBJECTIVES UNDERSTOOD	A								0	0		13.4%
	POSITIVE LEARNING CLIMATE	J								9	.7		
TOTAL EXCLUDING "H"										1178	100		

SESSION TYPE Workshop Theory

REMARKS

The percentage totals are added to ensure that they equal very close to 100%. Absolute accuracy is not necessary but the total should approximate 100%. The two percentage totals of the Involvement Cycle (that is totals, I and G) are added and entered into the box under "Cycle %'s" at the extreme right of the Summary Matrix. The three percentage totals for the Instructional Cycle, (under rows, E, D and F) are added and the total recorded under the "Cycle %'s" column at the extreme right. The Neutral Informing percentage is entered on the extreme right on its own. The four categories of the Orientation Cycle are added and their total recorded.

When these four "Cycle %'s" are added they should approximate 100%.

SUMMARY MATRIX LEVEL 3

DETERMINANTS OF LEARNING

SUMMARY MATRIX

NAME K. Smith

PLACE L.T. Tech

DATE 3/5/83

RECORDED E.

PERFORMANCES			CRITERION COMPETENCIES							TOTALS	%	TIME	CYCLE %'s
			1	2	3	4	5	6	7				
INVOLVEMENT CYCLE	ATTENTION FOCUSED	I									0	0	
	RANGE OF SENSES	H	596								596		23.7%
	ACTIVE PARTICIPATION	G	250		29						279	23.7	
INSTRUCTION CYCLE	REINFORCEMENT	E	31								31	2.6	
	FEEDBACK	D	66	1	11						78	6.6	19.4%
	MULTIPLE EXAMPLES	F	16	101			3				120	10.2	
	NEUTRAL INFORMING	N	396	83		32					511	43.4	43.4%
ORIENTATION CYCLE	OPTIMAL AROUSAL	C	7		91	5	39				142	12	
	OBJECTIVES SEEN AS RELEVANT	B	8								8	.7	13.4%
	OBJECTIVES UNDERSTOOD	A									0	0	
	POSITIVE LEARNING CLIMATE	J	9								9	.7	
TOTAL EXCLUDING "H"										1178	100		

SESSION TYPE Workshop Theory

REMARKS Outstanding AVA. Class participation very relaxed. V.G. use of social reinforcers. Rather long on N1+H1 but range of activities. Objectives!!

Using the Summary Matrix for Level 3, while considerably more demanding than Levels 1 and 2, does give a commensurate pay off in terms of the clarity and usefulness of the record for reflecting learning potential provided by an instructional period. As in the previous two examples, begin with "Attention Focussed", Category I. Add all the 1's (if any) occurring throughout the script against row I. That title is entered in row I under the 1 of the "Criterion Competencies" section of the form. When that is completed add all the twos in row I throughout the Sequential Record and enter the total under the 2 in row I of the Criterion Competencies. Deal in a similar way with any 3's, 4's, 5's or 6's which occur under Row I. These are then totalled and entered the "Total" column to the right.

Once row I is completed then row H can be treated in the same manner, working down through all of the Performances. The heavily blacked out section of the Summary Matrix simply indicates that Category D has only 3 Criterion Competencies as against Category C which has seven. Once all the Criterion Competency categories have been completed and totals obtained, the grand total can be calculated, (once again omitting Total at Row H). Percentages are calculated the same as for Level 2 coding and the percentages grouped and entered into the Involvement Cycle, Instructional Cycle, etc. (See example level 3 coding on page 156).

The coder should not be worried to find that many of the Criterion Competency boxes remain empty. In fact it is seldom that more than 30-40% are used in any one instructional sequence. The time column is only used by an instructor or teacher trainer who wishes to compare the amount of time spend on a particular activity as against another activity. Time is computed by dividing the total 5 second blocks by 12 and recording the number of minutes spent on a particular performances. It is quite salutary for an instructor to be shown he has spend 35 seconds on objectives and 2 hours on instruction, or a university lecturer to be told he has spend 3.5 minutes on instruction and 47.5 minutes on Neutral Informing.

RATIO FORM

The purpose of the ratio form is to allow comparisons of the time an instructor devotes to various activities which facilitate learning. Complete omission of one or more of the categories which determine learning may veto, or at least place considerable constraint on learning. The most important variable instructors can manipulate is the percentage of time spent on each cycle. There is no single best score for any cycle or any category. There is no best score for any comparison of cycles or of categories.

It would be very comforting to know for certain that 11.5% of time should be spent on orienting activities but such is not the case. Broad guidelines only can be suggested and these guidelines will depend on the type of session being observed. It is quite usual for workshops to include a higher involvement score than some classroom theory lessons. This is not a matter of necessity. It may only be that the type of involvement in workshop activities should differ from the type of involvement required for classroom theory lessons.

The introductory lesson in a series may need to involve a high degree of orienting or organisational Neutral Informing. It may also be that orienting within an introductory lesson should only be of a different type to orienting involved in lessons later in the series. The Neutral Informing provided in a university lecture is typically of a higher percentage than an information lesson given to 11 to 12 years old students. This again may not be of necessity, but backed up by our knowledge of learning factors it is highly likely that in both cases Neutral Informing should be replaced as much as possible by the more effective "Instructional" categories.

It is the relationship between time spent on one activity in comparison with time spent on a second activity that reveals the learning potential provided by instruction. The quality of that relationship and the quantifying of that relationship will vary, depending upon the learning situation involved.

Some very clear guideline are provided if we examine the Determinants of Learning. Instruction and Involvement, (as defined in the Determinants), are both better than Neutral Informing for creating learning. Instructors should avoid unnecessary emphasis on Neutral Informing.

Instruction and Involvement are wasted if the learner has no perceived goal so it seems highly relevant that learners should be kept oriented to the required learning outcomes. It has been pointed out previously that even a brief time spent on specifying and clarifying objectives can markedly effect learning. If this is so, instructors must ensure there is a balance between time spent on objectives and time spent on instruction and involvement.

The evidence is overwhelming that a positive affective climate which includes the use of reinforcers improves learning. The guidelines are clear. A reasonable percentage of instructor time should be spent in developing these two areas. "Reasonable" may need to be defined for different cultures and different students, but the principle still remains. An examination of time spent providing a supportive learning climate gives strong indications of the quality of learning potential provided.

Multi sensory stimuli, correctly used, can aid learning. Information concerning the percentage of time spent using a multi sensory approach can also provide useful guidelines for instructors.

Instruction without learner involvement does not maximise learning. An analysis of time instructors devote to both instruction and learner involvement can be a revealing exercise.

The suggested RATIO FORM set out below provides some useful comparisons suited to a general initial analysis of instruction using instructional data provided on the Sequential Record and Summary Matrix covered previously. The categories printed in block capitals are deemed to be the most important while the relevance of those printed in "lower case" will depend upon the type of instructional session and the perceptions of the observer. A discussion of each ratio comparison (from one to twelve), follows.

USING THE "RATIO FORM"

DETERMINANTS OF LEARNING

		RATIO FORM	SCORE
1	NEUTRAL INFORMING	: INSTRUCTION + INVOLVEMENT - H	<input type="text"/> : <input type="text"/> = _____ (20% to 30%)
2		: INVOLVEMENT - H	<input type="text"/> : <input type="text"/> = _____
3		: INSTRUCTION	<input type="text"/> : <input type="text"/> = _____
4	ORIENTING	: INSTRUCTION + INVOLVEMENT - H	<input type="text"/> : <input type="text"/> = _____ (35%+ or - 10%)
5		: INVOLVEMENT - H	<input type="text"/> : <input type="text"/> = _____
6		: INSTRUCTION	<input type="text"/> : <input type="text"/> = _____
7	OBJECTIVES (A+B)	: INSTRUCTION + INVOLVEMENT - H	<input type="text"/> : <input type="text"/> = _____ (20%+ or - 10%)
8		: INVOLVEMENT - H	<input type="text"/> : <input type="text"/> = _____
9		: INSTRUCTION	<input type="text"/> : <input type="text"/> = _____
10	INSTRUCTION	: INVOLVEMENT - CATEGORY H	<input type="text"/> : <input type="text"/> = _____ (20%+ or - 50%)
11	CATEGORY J + CATEGORY E	: TOTAL	<input type="text"/> : <input type="text"/> = _____ (5%+)
12	CATEGORY H (INCIDENTS)	: TOTAL ELAPSED 5-SEC. BLOCKS	<input type="text"/> : <input type="text"/> = _____

1. NEUTRAL INFORMING ; INSTRUCTION + INVOLVEMENT (-H)

Neutral Informing is a very suitable form of presentation for entertainment purposes, for information that can be used immediately and need not be remembered, or for telling a joke. It is a method of presentation that holds attention but does not necessarily maximize learning.

The Determinant of Learning cycles of "Instruction" and "Involvement" are comprised of factors that have been consistently shown to facilitate learning. Category "H", (Range of Senses Used), is omitted from calculations in this section and examined separately in Section 12. The aim should be to attain a suitable balance between essential Neutral Informing, (such as organisation-informing), and Instruction - Involvement activities.

It would appear that an instructional session incorporating a heavy

emphasis on Neutral Informing is a waste of both trainee and instructor time. Such an imbalance could be represented by a RATIO of 50:25, where Neutral Informing (50), occupied twice the time devoted to Instruction Involvement (25). The resultant RATIO SCORE (50 ; 25) = 200% reflects this imbalance. If the RATIO of N.I. to I + I were only 2:50 it would appear that organizational aspects had been treated very lightly and the RATIO SCORE (2 ; 50) = 4% reflects this imbalance.

A typical RATIO SCORE, suitable for most normal instructional situations would be in the area of 20% to 30% and is represented as a bracketed "suggestion" on the extreme right of the Ratio Form.

2 NEUTRAL INFORMING ; INVOLVEMENT

3 NEUTRAL INFORMING ; INSTRUCTION

In some forms of Instruction, Involvement must be completely omitted and in some forms of Involvement, Instruction has to be entirely omitted. Categories "2" and "3" are included on the form in case these two situations arise and it is necessary to calculate ratios for those two situations. Often in assessing instruction an instructor-trainer is faced with a single demonstration lesson in which the students are extremely active or totally involved and instruction is kept to an absolute minimum or is not operating. Likewise, he may be faced with teaching situation where instruction dominates the whole lesson and the involvement aspect is to follow in a subsequent lesson. In these situations the ratio score suggested for Category 1 would apply.

4 ORIENTING : INSTRUCTION + INVOLVEMENT (-H)

Even a cursory examination of the orienting Cycle categories will show that two phases are involved. One is the pre-instructional phase where the trainee is introduced to the objectives and to the relevance of objectives. The second phase is that which more commonly occurs throughout an instructional session where the instructor asks questions, uses a trainees name to gain his attention and expects answers from the students. Because of these two factors, the suggesting of a satisfactory Orienting Score becomes somewhat complex. An allowance is made for an initiating type of Orientation involving the two Objective categories. Added to this, is an Orienting Score for the more continuous type of Orienting involved in questioning. This suggested Ratio Score takes into consideration the importance of orienting learners to what it is they are expected to learn and to the importance of maintaining them "on-task " during instruction or during Involvement.

It would appear that an instructional session incorporating a heavy emphasis on Instruction and Involvement, without a preparatory Orienting session, is a waste of both trainees and the instructor time. Such an imbalance could be represented by a ratio of say 2% to 50% Yielding a Ratio Score of $(2 : 50) = \frac{4}{100}$. From the opposite point of view, too much time spent on Orienting and preparing students for Instruction without getting on with the tasks of Instruction and Involving the students, is also a waste of both the trainee and instructor time. That type of imbalance could be represented by a ratio of 50% to 25% where Orienting occupied twice the time devoted to Instruction and Involvement. The resultant Ratio Score $(50 : 25) = \frac{200}{100}$ reflects this imbalance.

A typical ratio score suitable for most normal instructional situations would be in the area of 25% to 45% with 35% being the mean. This allows a range of variations for different types of instruction.

5 ORIENTING : INVOLVING - H

6 ORIENTING : INSTRUCTION

As stated on Page 161 there are situations where either Involvement or Instruction will operate in isolation. The same principles apply as stated there concerning "Orienting : Involvement" and "Orienting : Instruction".

7 OBJECTIVES(A+B) : Instruction + Involvement (-H)

By adding Determinants of Learning categories A and B, an observer can determine the percentage of instructional time devoted to ensuring that "Objectives are Understood and made Relevant for learners". It is apparent that if this section of instruction is totally omitted or is very briefly treated, it is likely that the quality and direction of Instruction and the quality and direction of Involvement could be at risk.

It is useful therefore to establish a broad suggested Ratio Score to represent the balance of time to be spent on Objectives as against Instruction + Involvement. Using the same figures as previously it would appear that Objectives would be treated very lightly in comparison with Instruction - Involvement, when it could be represented by a ratio of 2:50. This would yield a Ratio Score of $(2 : 50) = 4\%$. Such a score will reflect this imbalance. At the opposite end of the spectrum, if the time spend on Objectives was 50 and the time spend on "Instruction - Involvement" was 25, the resultant Ratio Score $(50 : 25) = 200\%$ reflects this opposite imbalance. Analysis of a considerable number of instructional sessions seems to suggest that a Ratio Score in the vicinity of 20 could be accepted as desirable. This is reflected in the suggested score on the Ratio Form of $20\% \pm 10\%$.

8 OBJECTIVES (A+B) : Involvement - H9 OBJECTIVES (A+B) : Instruction

Once again, as on the previous pages, it is recognised that Involvement and Instruction may occur separately and space has been allowed on the Ratio Form for these Ratio Scores to be calculated where applicable.

10 INSTRUCTION : Involvement - Category H

It is one of the priorities of Learning that students learn more effectively when actively involved in the instruction. The relationship between the amount of time spend on Instruction and the amount of time spend on Involvement is quite crucial to instruction's effectiveness. While the type of teaching sessions will determine to a large degree the relationship between these two, a Ratio of about 2:1 would appear to supply sufficient meaningful Involvement. This would yield a Ratio Score of approximately 200% with a leeway of 50% in either direction.

11 CATEGORY J + CATEGORY E : Total

If the amount of time spent on establishing a Positive Learning Climate is added to the amount of time spent on providing students with Reinforcement, a useful picture is provided of the degree of warmth in the personal relationship existing in an instructional situation. By providing regular social reinforcers, individualizing responses, showing the trainees they are valued, using names and eliminating unproductive threat, etc, the quality and probability of learning are enhanced. It is when the time spent on this type of activity, is expressed as a percentage of the total times spent in instruction that we realise the validity of Professor Ned Flanders' statement that classrooms are "Affectional Deserts". If only 3 minutes out of every hour are spent assuring learners they are valued or providing them with a modicum of praise or respect because of the quality of their answers, a Ratio Score of 5 is achieved. Considering the impact of such a climate on learning

it is quite imperative in most cultures that a Ratio Score of 5 or more should be a goal for attainment on the part of the instructors.

12 CATEGOR H : ELAPSED 5 SECOND BLOCKS

Up to this stage we have been carefully avoiding Category H in all calculations. All that is necessary for calculating a Ratio Score in this area is to record the total score direct from Category H as the first number in the ratio.

Add the total elapsed 5 second blocks to attain the second number of the ratio. The case illustrated provides an initial category H score of 596. When that is compared to the duration of the period expressed as five second blocks, (1 hour = 720) a second number of 720 is obtained giving the resulting Ratio Score (596 ÷ 720) = 82%.

DETERMINANTS OF LEARNING

		RATIO FORM	SCORE
1	NEUTRAL INFORMING	: INSTRUCTION + INVOLVEMENT - H	$\frac{43.4}{43.1} = 100\%$ (20% to 30%)
2		: INVOLVEMENT - H	$\frac{43.4}{23.7} =$
3		: INSTRUCTION	$\frac{43.4}{19.4} =$
4	ORIENTING	: INSTRUCTION + INVOLVEMENT - H	$\frac{13.4}{43.1} = 31\%$ (35%+ or - 10%)
5		: INVOLVEMENT - H	$\frac{13.4}{23.7} =$
6		: INSTRUCTION	$\frac{13.4}{19.4} =$
7	OBJECTIVES (A+B)	: INSTRUCTION + INVOLVEMENT - H	$\frac{.7}{43.1} = 2\%$ (20%+ or - 10%)
8		: INVOLVEMENT - H	$\frac{.7}{23.7} =$
9		: INSTRUCTION	$\frac{.7}{19.4} =$
10	INSTRUCTION	: INVOLVEMENT - CATEGORY H	$\frac{19.4}{23.7} = 82\%$ (200%+ or - 50%)
11	CATEGORY J + CATEGORY E	: TOTAL	$\frac{3.3}{100} = 3.3\%$ (5%)
12	CATEGORY H (INCIDENTS)	: ELAPSED 5 SEC BLOCKS	$\frac{596}{720} = 82\%$

OVERVIEW

The "Determinants of Learning" system is not a simple method that, fixed to existing systems with enthusiasm-bright tacks, can transfigure instruction. It requires a clear perception that teaching does not necessarily help learning, that instruction can reduce learning and that training may stop people wanting to learn.

To use the "Determinants of Learning" system requires a change of perception so that instructors not only comprehend but can also apply the principles embodied in the phrase, "Teaching be Dammed, Let's focus on Learning".

The "Determinants of Learning" system arises from, and is firmly based on, the practical implications of learning psychology. Each section is supported by directly relevant research evidence. The application of its methodology to training, and the "Measure of Learning Potential," can be a powerful weapon against inefficient instruction.

The system provides guidelines for improving instruction. It gives guidance to the experienced as well as the novice. It is consistent in its reminder to instructors that learning must be the reason, the goal and the result of their efforts.

It is consistent in its principles of "Learner-sensitive" syllabus, "Learning-Centered" methodology and a "Learning-Improvement" observation technique.

The "Measure of Learning Potential" is not a judgemental tool. It is not an assessor weapon. It is not a system for grading, categorizing and demeaning students or instructors.

Its value for practicing instructors and for those in training, is as a tool for personal and professional development. It has no

value for those who regard themselves as already expert.

The system cannot replace the typical "Suggestions for trainees", checklists, or observation schedules. Punctuality, dress, keeping of records, professional behaviour, voice quality etc., will always be areas of useful focus. Those ranking, educating and socializing roles of Teacher-Trainers are necessary and desirable . BUT -(and it is a big BUT), when instructors are fulfilling their role as creators of learning, they must not only know how to create learning effectively, but do it.

It is the applications of the system by instructors to their own instructional methodology that will be its greatest attribute.

From the set of Ratio Scores, the total data on the Summary Matrix and the more detailed running commentary represented in a Sequential Record, instructors able to video tape their own instruction can quite objectively identify opportunities for contributing to learning. It is sufficient for instructors to isolate one area where they feel most useful change is possible and to pay attention to that particular area. Careful reading of the Contributing Skills relating to a performance will be of most use in obtaining practical suggestions concerning what is needed in order to improve any performance. If instructors find that they are extremely light in their handling of objectives, a first step would be to check their competency in applying the Criterion Competencies listed on Page 139. Having located the relevant Criterion Competencies, the Contributing Skills(which spell out the details of what is involved in each Criterion Competency),should be referred to.

Similarly, if instructors find that they do very little reinforcing of students, they should check the list of Criterion Competencies from Page 139, and refer to the list of Contributing Skills and the explanation of each on the following pages.

We are our own most critical judges. Students and instructor-trainees are also their own most critical judges. By providing knowledge of "Syllabus Construction", "The Determinants of Learning" and "A Measure of Learning Potential", we are providing useful tools. Tools that are not only for analysis, but also for improvement of the instruction our students will provide for the future students who they in turn will be helping to learn.

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