Teacher Knowledge Part 1: Unstopping the Dam

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is that of political interest in the affairs of educational institutions. Clearly, strong institutional autonomy is a necessary requirement to any effective implementation of a curriculum for teachers which stresses personal development. McNamara's discussion provides important illustrations of how Government, whether by design or default, can erode institutional autonomy in its zeal to have a hand in the process of curriculum development in universities and colleges.

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Research on teachers and their teaching aims at understanding what it means to teach. Such research is conducted in a variety of ways. Major users of its findings are teacher educators. It is hoped that the research findings will provide a knowledge base for teacher education programmes often characterised as being more whimsical than rational. There are two basic views of the process of becoming a teacher: "master the model" or "model the master" (Stones, 1972). Both views stress institutional conformity, draw upon institutionalised knowledge and aim at developing technical skill rather than professional competency. The intention of this paper is to suggest a theory, and accompanying methodology, which could be used to explore and develop a model of teacher development more in keeping with institutional and personal freedom: to explore the process of "becoming a teacher" as proposed by Fielding (1983).

The methodology was used in a series of studies on becoming a mathematics teacher between 1981 and 1983. (McQualter and Warren, 1984). It is based on Personal Construct Theory (PCT) (Kelly, 1955), and uses repertory grid (rep grid) preparation and analysis. After conducting the Newcastle studies and surveying other studies it was felt that PCT procedures would be very useful in studying teachers and their teaching, especially the process of becoming a teacher.

It was also felt that further work should not proceed unless it had a model of teacher development to provide a guide for extending Kelly's theory and accompanying rep grid procedures to the phenomenological world of teachers and their teaching. Such a model has now been provided (Fielding, 1983).

This model was developed to overcome the unease about, and often major theoretical objections to, teacher education programmes in operation in the 1970s (see for example Fuller and Bown, 1975; Hogben, 1982; Stones, 1984; Travers and Dillon, 1975). It provides for institutional freedom for those becoming teachers to make personal, autonomous selective responses to the task of understanding and mastering the complex of knowledge, skills

and ideology that make up the world of teaching.

Central to the model is the concept of role as a construct employed to establish, maintain, enhance and reconstruct a personal view of self: the role of teacher is seen as unique to each individual (Fielding, 1983, p.3). The model proposes six different roles through which an individual moves when becoming a teacher, often concurrently. The model was proposed to assist in helping the process of rethinking practices in teacher education. Emphasis was on the need to provide programmes to develop autonomous, competent professionals, not institutionalised skilled technicians. When the model was presented it was accompanied by six critiques (Shaw, 1983; Jones, 1983; McNamara, 1983; Symes, 1983; Cavanagh, 1983; Sheehan and Lewis, 1983).

These suggested that there was now a need to test the model; explore it in practice, check it empirically and discover its power to generate hypotheses and knowledge about teachers and their teaching (Shaw, 1983).

The model was seen as providing useful guidelines for determining and articulating the knowledge and skills to be included in a teacher education programme (McNamara, 1983, p.35) not just the product and process knowledge and skills but the deep structures, teacher belief systems, which support these (Shaw, 1983; Symes, 1983). For the studies of "becoming a mathematics teacher", Fielding's model provided a much needed theoretical framework for applying PCT procedures to the study of teachers and their teaching and for using PCT procedures in teacher education programmes (McQualter, 1985).

In proposing to use PCT procedures to explore and develop Fielding's model of teacher development it should be accepted that teacher education programmes, both pre-service and in-service, are concerned with three aspects: teacher practical knowledge, adult learning and professional education. Respectively these can be associated with programme content, programme procedures and programme intent. In the study of all three there has been a paradigm shift as described by Cavanagh (1983).

Alongside the well developed and productive psychometric research tradition there has developed the phenomenological research tradition. The latter is concerned with how the individual mind organises experience and gives meaning to situations whereas the former is concerned with objectivity and the development of generalisations about behaviour over groups. For example the psychometric tradition is evident in such work as that of Evans (1982) and Bourke (1984) while the phenomenological tradition is evident in such work as that of Young (1979) and Smith (1983). More specifically,

in relation to the three aspects given above, the phenomenological tradition is evident in work on teacher practical knowledge (Elbaz, 1983) adult learning (Thomas and Harri-Augstein, 1977) and professional education (Schon, 1983).

Most significant for this paper is the proposal that PCT procedures can provide an alternative, and fruitful, methodology for conducting research in education, particularly the study of teacher development (Pope and Keen, 1981, Ch.8).

Just what is this methodology? How can it be used to explore and develop Fielding's model of teacher development? The first question is dealt with in part 2 of the papers on Teacher Knowledge by McQualter in this issue, *Personal Construct Theory as the The Basis of a Methodology to Study Teaching*. The concern of the present paper is with the second question.

PCT and the Fielding Model of Teacher Development

PCT could be used to study many aspects of teacher professional development. The only requirement for its use is that the basic tenets of Kelly's theory are accepted as assumptions underlying any studies done.

Teacher professional development is often hampered by the fact that teachers either cannot or will not articulate their needs. PCT procedures, used on microcomputers, may help to overcome this problem. The TARGET programme illustrates how this was done in one situation (Pope and Keen, 1981, p. 142). The neutrality of the computer avoids the embarrassment often felt by a teacher in discussing teaching problems with another person. Software, developed for use on microcomputers, using the PCT procedure of grid elicitation and analysis fits into the pattern of adult learning: reflect, inquire, act, evaluate. PCT procedures provide the means to reflect and evaluate. Teachers can use the procedures, via microcomputers, to "see" how they are construing teaching, reflect upon their construing and strengthen or change their teaching style.

Such knowledge can help teachers in making decisions about teaching materials, how congenial they are to their style and about sources of assistance in development of teaching skills and procedures.

In studying teachers' practical knowledge the use of PCT procedures would help. Teachers are individuals and have different teaching styles, that is, each teacher orchestrates techniques and knowledge in different ways. The establishment of "norms" of teaching is inappropriate and the setting of absolute criteria for teaching standards is dangerous without first finding out how teachers develop their professional knowledge, what constructs

they take into the classroom, what views they hold about subject content, pupil development, learning and teaching and what factors influence their instructional decisions. It is in obtaining answers to such questions that PCT procedures can take their place beside the traditional methods of questionnaire, interview, protocol analysis, audio and video tape analysis. Most importantly PCT procedures enable the researcher to stand in the teachers's place and see their viewpoint. The teacher is not a "subject" but an agent, a co-worker in the enterprise.

In applying PCT procedures to teacher education the essence of PCT, the individual and organisation corollaries, need to be retained. In all the work done in a teacher education programme each student constantly asks the questions (1) What does this mean? (2) How is it used? (3) Why is it seen this way? (4) Does this perception need to be changed? Students are expected to order, to organise their experiences in teacher education programmes. The PCT procedures could be used here. However, they must be seen as producing individual results.

As Rathod has pointed out "the precise objective or ordination is unknown at the time of analysis, and the final product cannot be judged to be true or false, just or unjust, but only as useful or not useful." (Rathod, 1981, p. 126).

The theoretical model of teacher education being proposed by Fielding (1983) sees "becoming a teacher" as the process of role transformation and integration with a high degree of autonomous choice for each person going through the process. As he points out "professional role integration ought to be understood to lie with the individual rather than the institution." (Fielding, 1983, p.2).

The teacher education institution should provide the circumstances through its programme to foster individualised role integration. It should develop the distinctive "one-ness" of the person and provide the means for distinguishing among "others". A repertoire or roles, all contributing to typification of self, are to be sought, all of them combining in the person "being a teacher". The model accentuates the key corollaries of PCT, individual and organisation. It suggests six roles; tertiary student, novice teacher, novice professional, client, centered professional, curriculum centered professional and education theorist. Entry into, duration in experience of each role is seen to be unique to each individual. Roles are not seen as being pre-empted by a new role, rather that each role becomes a "subsystem" within the totality of "being a teacher". This is very much the way in which current PCT theory describes a person's *cognitive development:* a continual process of differentiation and heirarchic

integration (Adams-Webber, 1981, P. 49-53). Fielding's model also incorporates Kelly's corollary of *commonality*. The professional world of the teacher is a pedagogical sub-culture. Kelly points out that "persons belong to the same cultural group not merely because they behave alike nor because they expect the same things of others, but especially because they construe their experiences in the same way." (Kelly, 1955, p.94). Teachers have their own world view which is distinct, in many aspects, from non-teachers. Fielding's model incorporates Kelly's sociality corollary in that teachers share a professional sub-culture that requires them to play a role in the social process, i.e. education, in which they have to construe their pupils' outlook. Novice teachers who have used PCT processes are shown that those they teach are likely to be individual, have different ways of construing what is presented to them but do share, to some degree, a common perspective.

Fielding's model accepts Kelly's fundamental postulate and the construction corollary as the basis for operation of a teacher education programme. Teacher education programmes provide experiences, essentially of a practical nature, to their students. Students may be told what to do but in practical work students apply what *they* have learned to the situation as *they* perceive it. Becoming a teacher is an individual process and no amount of pressure to enforce conformity can stop the development of such individuality. On this basis Fielding's model can be seen as containing the essence of Kelly's theory.

Some Problems

In thinking about the use of PCT procedures to explore Fielding's model certain problems need to be stated. At this stage, the exploration of the nature of PCT, its procedures and results in the context of mathematics teacher education reveal three main concerns.

First that most of the results of PCT work has been in the area of clinical psychology. In this area there is a consensus of what is "a disturbed (different?) person" and what is not. There has been the suggestion made for a "dictionary of average relationships among constructs" (Fransella and Bannister, 1977, p.87). Having accepted a model of teacher education dedicated to maintaining individuality the two ideas mentioned above seem to suggest a new form of "institutionalisation" and raise the question as to what can be considered "good" pedagogy in the context of the Fielding model.

Second is the concern shared by all those working in the area of PCT, supplied versus elicited elements and constructs. A programme of teacher

education, in keeping with Fielding's model, requires the use of the products of research on teaching and processes drawn from PCT studies. Students are asked to reflect on ideas, events and objects pertinent to teaching. They are going to analyse, explore, adapt and practice. Apart from the problem of achieving paralysis by analysis, there is the problem of how we are to obtain products and processes to be used in analysis, exploration, adaptation and practice. Do we use the considerable material available as a source for supplying constructs and elements? Does it need to be checked out using PCT procedures? In analysing such materials which PCT measures should be used? Rathod (1981) has gone well on the way to answering this last question with his recommendation concerning spatial models. However, paralysis by analysis is still a problem, particularly if one uses INGRID 72 (Slater, 1977). If you are not careful 'fascination of figures' can occur (Fransella and Bannister, 1977, p.109).

Finally there is the concern about sources pertinent to the development of basic pedagogical knowledge. This concern is in some ways at the opposite pole to the concern above. Research on teaching, to provide basic pedagogical knowledge, must go into minute detail, or deep analysis. How to do this and what sources need to be tapped are important considerations. Fortunately the "how" questions can be answered to some extent as the INGRID 72 programmes provide a wealth of material. The results however are only as good as the sources from which the original elements and constructs are drawn. Research results already available must be validated before they become a source of elements and constructs. The range of sources needs to be widened to avoid obtaining basic pedagogic knowledge reflecting just a "technical" view. Teachers as professionals can be conservative and very much in the prudential tradition of community service. Teachers' elements and constructs need to be balanced against elements and constructs from others involved in the process of teaching or its study.

Despite these problems the PCT approach to exploring Fielding's model of teacher development has a two-fold value. First it provides a rich theoretical framework which has been found to be meaningful in numerous contexts. Second it provides a practical methodology that allows people to "see" how they are construing a domain and reflect on it. By using PCT procedures those studying "becoming a teacher" as delineated by Fielding's model can tap into the personal practical knowledge of neophyte and experienced teachers, and so stand in the other person's shoes. At the same time PCT procedures provide the means for those becoming teachers to do so as adults responsible for their own professional development. PCT procedures when used to study teachers and teaching as a co-operative

enterprise between tutor and student teacher, consultant and practising teacher may well "unstop the dam" and provide all those concerned with improving the process of becoming a teacher, with a rich source of human knowledge about pedagogy. The use of such knowledge in teacher education programes could be validated by its source and guided in its use by the Fielding model of teacher development.

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Teacher Knowledge Part 2: Personal Construct Theory as the Basis of a Methodology to Study Teaching

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In the previous paper, *Teacher Knowledge Part 1: Unstopping the Dam,* the suggestion was made that a methodology based on Personal Construct Theory (PCT) could be used to explore and develop a new model of teacher professional development prepared by Fielding (1983). Two questions were asked. What is this methodology? How can it be used to explore and develop Fielding's model? The second question was dealt with in the earlier paper. The first is the subject of this paper. The intention here is threefold; firstly, to describe the theory of personal constructs, originated by Kelly (1955) and elaborated by Fransella and Bannister (1971) second to discuss the preparation and analysis of repertory grids, a procedure stemming from the theory conceived by Kelly (1955, 1961) and again elaborated by Fransella and Bannister (1977); finally to consider some of the measures used in and interpretations made of repertory grid analyses.

Personal Construct Theory

Kelly's idea of a "personal construct system" holds that a person is an activist, constructing something. Personal constructs are personal representations of some aspect of reality. Personal knowledge and the process of personal learning involve translating an idea into action and experiencing its consequences. To Kelly reality is subject to many alternative constructions and when exploring a person's construct system we are viewing the person as "man-the-scientist" not "man-the- laboratory-subject" (Kelly, 1961). There are three basic assumptions: constructive alternativism, "man-the-scientist" and double entity choice. First, there are alternative ways of seeing reality; second, individuals derive hypotheses (expectations) from theories (personal construing) which are tested (actions); third, a construed object stands in contrast to at least one other imaginable object (Kelly, 1961). A construct discriminates between entities and is used to indicate a person's stance. A construct system can be the basis on which a person develops his or her personality, attitudes, habits, concepts or philosophy. Personal constructs are the baseline for differentiating between