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ACTION RESEARCH: AN EXPLORATION

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of the requirements for the Degree of

MASTER OF EDUCATION
(MATHEMATICS EDUCATION)

by

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thanks, Chris.

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- SUSAN, 13. (in Blishen (ed), 1979:133.)

CHAPTER ONE.

INTRODUCTION

1.1 WHY I CHOSE ACTION RESEARCH, USING TRIANGULATION, AS MY FIELD OF STUDY.

I have chosen action research as the topic of this dissertation because I view action research, with triangulation, as a means by which the day-to-day running of my classroom can be questioned.

As a teacher in the primary schools, I became frustrated. I experienced our system of education as being damaging to the children and myself. I was aware of this but I had no alternative vision of what could be done to improve the situation.

I wanted to improve my practice but I found very little encouragement and/or guidance from the heads of departments or headmasters at the schools where I taught. These people seemed to be less concerned with helping those of their colleagues who wished to know more about effective teaching than policing them, making sure that work was marked and enough written work was done to satisfy inspectors.

The smugness of my superiors and my growing concern for what I saw happening to myself and the children in my care, made for a very unsettled state of mind. This was one of the main reasons for embarking on my present studies.

It was here that I was introduced to action research and triangulation. After doing preliminary readings for the course I was convinced that action research was to be a most useful way of researching my classroom practice. The idea of using triangulation, particularly, seemed very exciting.

It offered many exciting possibilities within the classroom situation for myself as well as for the children. Action research promised to be a way in which I could take a look at what I was doing. I could, in a sense, detach myself from the situation of the classroom and then from the position of observer take note of the processes within the classroom.

Videorecording and writing-up one of the course papers which focused on my own teaching practice, I realised that it would be valuable to withdraw to quieter surroundings and take a "new" look at my teaching practice.

In our schools, children have no say at all in what amounts to most of their lives. I thought this to be a very unhealthy state of affairs as they were never being allowed to take control of their lives. Children in the schools go about burdened by the dictates of adults.

I was constantly aware of the huge gap that existed between the world of the teachers and that of the pupils. I found that the pupils jealously guarded the entrance to their world. It was as if one had to prove oneself to "be on their side" before they would take one into their confidence. This disturbed me, for

I felt that since I worked with the children for such a great length of time everyday, I should know their true feelings if I was to bring about any effective learning.

Triangulation (as described by Hull, 1985b.) excites me in that it holds the promise of democratising the classroom situation as well as building open, honest dialogue between teacher and learners.

This, then, has been the main reason behind my choosing to study action research with particular attention to triangulation, in greater depth.

1.2 RESEARCH AND EDUCATIONAL PRACTICE

It seems that the question of researching educational practice is a controversial one. Teachers often feel that they are being left out in the cold and researchers have tended to form elitist groups that do not seem to identify with the needs of the teachers. Morrison (in Chanan and Delamont (eds.) 1975.) says that the relationship between teachers and researchers is of vital importance to the authenticity and the effectiveness of the research.

Earlier educational research relied very heavily on the behaviouristic, scientific methods. These studies were heavily researcher orientated. Teachers were hardly involved in any way except, perhaps, to furnish information that would facilitate the researcher's work. Teachers would not expect to benefit from the research.

I think teachers are very sceptical of the research done in this way and they would suggest that it is easy for researchers to reach conclusions within the safety of their "ivory towers", away from the complex situation and "messiness" of the classrooms.

South Africa has an even greater problem. Many of the innovations introduced into our schools seem to have mysteriously appeared from "overseas". This could alienate the South African teacher because it is not an "own" educational research tradition.

It often appeared to us as teachers, that the academics who wished to see certain ideas introduced into the schools were merely doing a "transplant", usually a British or American "transplant".

It certainly never entered our heads that maybe we could research our own teaching practice. I think this is because the process of research has been mystified in the eyes of the teaching profession. Research has come to be regarded as an activity engaged in by a few of the academic elite. Teachers seem to think that reading for a Masters or a Ph.D Degree is a prerequisite for doing research.

It is only by doing this course, that the possibility of researching my own practice as an ordinary teacher, has been opened to me.

Teacher-based research could become a very real possibility for the teachers in our schools. This research must be freed from the normal constraints of a set method of investigation. If the constraints or "rules or regulations" binding the research were to become too intricate, the research process would be mystified. Teachers would feel alienated: research is only to be engaged in by a few experts. The researcher should not be "an external investigator providing solutions to educational problems" but she/he should be a "consultant whose task it is to assist teachers to arrive at sound practical judgements." (Carr and Kemmis, 1986:30)

Research can then offer the exciting possibility of creating opportunities for researchers and teachers to get together and question the educational process.

1.3 THE ISSUE OF QUANTITATIVE RESEARCH IN EDUCATION AND WHY I CHOSE TO AVOID IT AS A METHOD OF STUDYING CLASSROOM PRACTICE.

Researchers who support the concept of quantitative research in education feel that it is due to the reliability and accuracy of their findings (validity) that this method should be used. (Le Compte and Goetz, 1982) It remains easier for the researchers to verify and substantiate their findings as they can always refer back to structured pre- and post-tests. Thus educational researchers have sought to structure their research programmes much like programmes undertaken in the physical sciences. They work towards the laboratory-based work style. (Vyas, 1979) This method of research is widely respected in academic circles and is readily accepted.

Pope and Denicolo (1986) state this type of research is usually seen as the scientific method and that scientific behaviourism and psychometrics are often used to substantiate research done in this way. Many researchers feel that it is only by using this method of research they can remain objective (unbiased) and therefore can claim credibility amongst their colleagues.

The research findings are then usually expressed as generalisations i.e. findings that would be applicable to any situation similar to the situation that has been researched.

In this type of research the classroom teacher has no part in the actual research process and the theories that would arise from the investigation. If a teacher should become involved it would usually be that the teacher is seen as a source of information. The researchers are academics, and teachers do not have the same training and skills as the researchers. Vyas (1979) says that teachers are never fully involved in this type of research which usually only flourishes in universities and other similar institutions.

Another reason why quantitative methods of research abound in fields of study that focus on people is man's desire to control and predict. To understand a certain situation objectivity gives the researcher the sense that he or she has control over it, in other words the given situation has been pegged down and has been made static. This, in a sense, could be seen as denying the people involved their "being", because of the constant change that is involved in "being". This static method of study cannot be about understanding and knowing a situation while people resist control and dehumanisation. (Pinar, 1981')

1.3.1 CRITICISMS OF THIS METHOD OF RESEARCHING EDUCATIONAL PRACTICE.

This type of scientific research is criticised because of its inability to relate its findings to teachers. It remains far removed from the people who are really involved. Skilbeck (1983:12.) says that these methods of research fail "to account for or to acknowledge free human action, which only a certain kind of research orientation will keep constantly before the teacher."

According to Freeman (1986) McCutcheon summarises the criticisms of quantitative research as follows:

1. Researchers are often outsiders and complete strangers to the teachers. These outsiders then prescribe to teachers as to what should be done in classrooms they have never seen the inside of. Teachers have very little, if any, control over the research which is being done. It is felt that researchers often engage in their work for no other reason than their own esteem and hardly ever from a sense of caring what happens in the classroom.
2. The reports can be written in jargon and in a condescending tone. These reports are then often published in obscure and/or expensive journals.

I have found that many of these reports contain lists of seemingly meaningless statistics. I felt that these statistics could mean very little to the teachers who were struggling from day to day in their classrooms.

Stenhouse in Skilbeck (1983:14.) is particularly harsh in his criticisms of what he calls "the psycho-statistical paradigm" method of research. One of the main criticisms being that findings rest largely on samples and probability theory and hardly ever on professional judgement. Other criticisms are that findings can often be trivial and that it often recommends a "uniform" teaching approach across all children."

This type of research dehumanises the people involved. There can be no real communication and dialogue existing between people who use jargon and who reduce children and teachers to objects to be studied in laboratories. People are objectified and denied the right to be human.

Intellect occupies prime position of importance and so the hearts and souls of the people involved in the education of our children are negated.

Laing (1967:51-53.) denounces the use of so-called objectivity. He says that to describe a scene objectively we would be "denuding it of what is ontologically present in that situation. Every description presupposes our ontological premises as to the nature (being) of man..." It is by trying to reduce man to an object that has to be studied "objectively" that researchers dehumanise the people concerned and in so dehumanising these people they dehumanise themselves. When we cannot allow others to be human we are committing an act of violence against those people. I see quantitative research perpetuating a violence that we may not tolerate in an already violent world. Laing (1967:52.) continues his criticism,

"Natural scientific investigations are conducted on objects, or things, or patterns of relations between things, or on systems of "events".

Persons are distinguished from things in that persons experience the world, whereas things behave in the world... Natural scientism is the error of turning persons into things by a process of reification that is not itself part of the true natural scientific method... The error fundamentally is the failure to realise that there is an ontological discontinuity between human-beings and it-beings... If human beings are not studied as human beings, then this once more is violence and mystification... Gone is any sense of possible tragedy, of possible passion. Gone is any language of joy, delight, passion, sex, violence. The language is that of the boardroom."

It is vital for us, as teachers, to demand that the research concerning our practice be humanised where we i.e. the children and the teachers, are no longer treated as objects. We, the teachers, should make every effort to stop the perpetuation of a violence against our very beings.

1.4 **WHAT IS ACTION RESEARCH?**

Grundy and Kemmis in Flanagan, *et al.* (1984:3-4) define educational action research as:

"... a family of activities in curriculum development, professional development, school improvement programs, and systems planning and policy development. These activities have in common the identification of strategies of planned action which are implemented and then systematically submitted to observation, reflection and change. Participants in the action being considered are integrally involved in all of these activities."

Teachers can use action research to examine their teaching practice. A teacher may identify a concern for example: "The instructions at the beginning of my lessons always seem muddled." The teacher may identify these concerns in collaboration with a facilitator. The teacher then suggests a way to improve the concern that has been identified. The suggestion or plan of action is put into practice. This plan of action is then subjected to critical reflection by the teacher and the facilitator (subject to the approval of the teacher). The teacher can then suggest ways to improve teaching practice even further. A renewed plan of action is essential to the cyclic feature of action research which is emphasised by most practitioners of action research (see Kemmis and McTaggart, 1982).

Action research creates the space for a teacher to employ a disciplined enquiry and a systematic method to develop and deepen their intuitive understanding of their teaching practice. (Lomax, 1986:42-44). Action researchers impose discipline on their systematic enquiry into their praxis by using the action research cycle based on Popper's scheme for describing the growth of scientific knowledge:

- " * I experience problems
- * I imagine solutions
- * I act in the direction of the imagined solutions
- * I modify my problems, ideas and actions." (Lomax, 1986:45)

Nixon (ed., 1981:5) says that one of the assumptions underlying action research is: "action research can be undertaken by any teacher in any classroom. This is not to say, however, that it can be undertaken lightly. Action research is an intellectually demanding mode of inquiry, which prompts serious and often uncomfortable questions about classroom practice." Action research is about sharpening perceptions, stimulating discussions and encouraging questioning by all those involved in the process of education. (Nixon (ed), 1981)

This approach holds the potential of demystifying research. (Freeman, 1986:204) As teachers become more involved with the research so they learn to identify with it and take ownership of educational research - giving the research back to its rightful owners: themselves and the children involved.

Pinar (1981:86) says qualitative research "is politically progressive, as it is epistemologically sophisticated, because it understands that a basic meaning of human life is movement, conflict, resolution... opposing each other in ways which give birth to new orders of understanding and life. The task is not to control movement, nor is it merely to portray it. It is to contribute to it, acting as midwives in the labour which is human history coming to form."

Knowledge cannot merely be sought to add to the already vast body of knowledge that abounds within the minds of man but it should contribute something to the quality of man's spiritual existence and not merely his physical and material existence. This can only come about when the people involved with the bringing about awarenesses, understandings and knowing fully acknowledge the constant flux of man's being and seek to embrace that constant change within the paradigm of their research. Understandings that arise from this position of study could be sensitive to the issue of the constant change of man's existence and therefore could contain within them the same potential for change. It could be seen as a continual process of revelation, a process of opening up and a process of uncovering.

Researchers that use this method find that rigour and excellence need not create elitism and mystification in fact it leads to a democratisation of the research process. (Chambers,, 1983). Especially when both the teacher/researcher realise that they are involved in something worthwhile and meaningful. Rigour is essential to this style of study if it is to be credible and meaningful in the eyes of the people who are to benefit most by it.

Action research can give teachers the opportunity to become involved in educational research and to build up a common stock of knowledge to draw on for their professional development. (Nixon, 1981)

Action research offers the teachers a means by which they can reflect on their practice. The insights and awarenesses that arise from this process of reflection could lead to the teacher introducing changes in her/his practice. (Walker in Chanan and Delamont, 1975)

Action research is an attitude of critical, systematic inquiry which can give us, the teachers, a sensitive view of that which we have come to take for granted. (Morrison in Chanan and Delamont (eds), 1975:20)

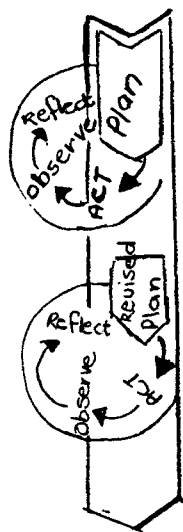
In this research the teacher is "expert". It uses the natural language of the users and it remains as close as possible to the organisational constraints that the users face. (Walker in Chanan and Delamont (eds), 1975:230)

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Researchers using action research use different ways of creating data. Observations can be recorded in field notes, on videotapes or audiotapes, and diary entries. Interviews are essential. The researcher has to analyse data to see what is relevant to the study.

In one of the lectures given by Charles Hull, during his visit to the Department of Education in February, 1986 he said that action research was about helping teachers refine their understanding of their practice. He went on to say: "...it is, in a very real sense, about convincing ourselves that we don't know what we're doing." It is a way by which teachers can examine their ways of bringing about education and seeing exactly how set ways, methods and routines govern their teaching practice without ever really being questioned.

Action research can be the means that would allow a classroom to keep changing according to the needs of the people within it and not forcing the teacher and the children to adjust to the needs that have been established and which have remained unchanged and unchallenged through many years.

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Action research is not a static mode of research. To be authentic it must form the following cycle:



[Kemmis and Mc Taggart, 1982: 8]

There are four main moments within the cycle:

1. to develop a plan of action to improve what is already happening,
2. to act; to implement the plan,
3. to observe the effects of action in the context in which it occurs, and
4. to reflect on these effects as a basis for further planning, subsequent planning and so on, through a succession of cycles. (Kemmis and McTaggart, 1982:7)

For action research to remain authentic and meaningful it must continue in this cycle. This spiral of action research is the way in which our learning about the situation is organised. If what is learnt during one such cycle is not used in further cycles then the investigation becomes mere problems-solving and is called "arrested action research". (Grundy and Kemmis in Flanagan, et al., 1984)

This demands that relationships between all participants involved in the educational process be established. When triangulation is used it could mean the establishment of authentic dialogue amongst teachers, students and teachers. (Morrison in Chanan and Delamont (ed.), 1975). This in turn could open other exciting possibilities concerning the demystification of many of the aspects of the educational process.

Many researchers may feel uncomfortable with what looks like an unstructured and undisciplined recounting of anecdotes which is to give rise to theory. This is evident when one considers the early years of action research and looks at the ways the researchers who had broken away from the scientific method tried to advise different ways of recording observations. They tried to devise heavily structured means of observation, e.g. the use of the Flanders Interaction Analysis Categories. (Stubbs and Delemont (eds.), 1976)

Already in 1975 Adelman and Walker realised that using these devices for recording observation would limit the investigation. They stress that the data not collected by these instruments would often be more valuable to the investigation than the data that was collected. (Adelman and Walker in Chanan and Delamont (eds.), 1975)

Action research has the possibility of becoming meaningful to South African teachers Teachers no matter what their academic qualifications can become researchers. They are, after all, the "experts" as to what is happening to their classrooms. Academics or outsiders also have an important role to play as they are not submerged in the life-world of the school and are more likely to see things that the teacher and/or students have come to take for granted.

1.5 TRIANGULATION

I have become convinced of the importance of triangulation as a process for researching classroom practice because I have come to believe that without this sort of dialogue between learners and teachers we are all destined to remain submerged in the culture of silence.

Triangulation is action research involving three dimensions: teacher, pupil and a participant-observer. Triangulation provides an opportunity "for pupils to join with their teachers in critical appraisal of the aims and implications of ...school work. It generates a critically reflexive discourse." (Hull, 1985b:23) ... Triangulation involves gathering accounts of a teaching situation from three different points of view. "Each point of the triangle stands in a unique epistemological position with respect to access to relevant data about a teaching situation... By comparing his own account with accounts from the other stand-points, a person at one point of the triangle has an opportunity to test and perhaps revise it on the basis of more sufficient data." (Hull, 1985a:2-3). It is through triangulation that the three worlds of expertise can meet and from this new position of a shared experience participants can share the risk-taking that is necessarily an integral part of building new relationships.

If teachers alone are to become involved in the questioning of their practice then the children are destined to remain within a culture of silence. X

To keep children and/or teachers submerged in this culture of silence is to oppress them. Any form of oppression dehumanises the oppressed and the oppressors. While children and teachers are being oppressed there can be no talk of education. There can only be talk of schooling where children are treated with kindly paternalism. It is only when we recognise the right of the child to have a say in what affects most of his life and then allow him/her to have some control over that which is his/her lived reality that we can begin to talk of education and not domestication. (see Freire, 1972)

I believe that it is through this process of triangulation that teachers and pupils can be given a say in that which takes place in the classroom. It can become a process whereby the children, together with the teacher, can start questioning and talking openly and honestly about the way education takes place within their classroom. It is a way of raising the learners and teachers to critical consciousness about taken-for-granted realities that exist in the classroom; realities that influence and shape their lives. It can become a meaningful and authentic way of bringing children and teachers to a critical awareness of these realities.

This process of triangulation can bring the learner and the teacher together in dialogue. In Freirian terms, this means that there exists the possibility of authentic communication. The teacher's methods are no longer a way to control and direct the behaviour and learning of the child. The teacher's method or pedagogy can now become an expression of the consciousness of the learners.

Triangulation involves researching teaching practice using the observations of the teacher, students and a participant - observer. The teacher is in the best position to say what his/her aims and intentions were during a lesson while the children are in the best position to say how they experienced the teacher's lesson and the participant - observer can provide valuable feed-back concerning visible interaction between teacher and learners. (Elliott in Flanagan, et al., 1984)

Triangulation gives the participants procedures to cross-check how different participants have experienced the educative process. (Walker, et al., 1979)

Hull (1985b) describes how he, as outsider or participant observer, would help a teacher select a section of a videorecorded lesson to play back to the children in the class. The children would then be invited to critique that which the teacher had done.

This situation is a very sensitive one for all involved, as becomes evident on reading the account. I have come to believe that it takes a special kind of teacher to become authentically involved in triangulation. The teacher must be convinced that children have a right to a say in that which happens in their classroom. The teacher must be committed to a democratic type classroom where all participants can be equals in the educative process. Children's suggestions or questions must be treated with the utmost seriousness. This should never degenerate into a situation where a teacher makes certain paternalistic gestures towards the children.

Once the children perceive themselves as being equals and being treated likewise then, and only then, does the possibility exist for authentic communication and dialogue to take place.

Furthermore, for this dialogue to be authentic if ^t must take place within an atmosphere of love, humility, faith, trust and hope. (Freire, 1972)

It is clear that it would take a special kind of teacher to engage in triangulation. Strict, authoritarian teachers who think that they are superior in knowledge and skills will not find it easy to open their practice up to be scrutinised by thirty or more "enquiring minds". Enquiring minds that have the knack of posing awkward questions at impossible moments.

It is my belief that for every one of these teachers there is one of the "special" kind - a teacher who willingly invites children to talk about the things that happen in the classroom and to criticise them. It is for these teachers that triangulation can become meaningful. Through triangulation teachers can close the gap that exists between their lived reality and that of the learner.

Teachers have often said that children would be incapable of seriously critiquing teaching practice. Studies have proved that children are very capable, sensitive critics if they are given the chance to do so. (See: Hull, 1985b)

It is important to note that most people involved in studies, using triangulation, have stressed the fact that the criticisms have to be legitimised in the eyes of the children (Heap in Hull, et al., 1985) and they have to be encouraged to do so, as they have seldom experienced the freedom to criticise their teacher's practice. (Walker, et al., 1979)

When learner and teacher can come together in authentic reflection concerning the teaching and educative process in the classroom then we may talk of the possibility of liberation in the Freirian sense: i.e. "liberation is a praxis... the action and reflection of men upon their world in order to transform it." (Freire, 1972:52) Using triangulation teachers and students can "become jointly responsible for a process in which all grow." (Freire, 1972:53) This process of growth is emphasised by a teacher involved in Hull's project. (Hull, 1985b)

I feel that it is only when students and teachers can come together in authentic dialogue about education that authentic education can occur.

"Authentic education is not carried on by A for B or by A about B, but rather by A with B, mediated by the world..." (Freire in Hull, 1985b:16)

CHAPTER TWO

AN ATTEMPT AT ACTION RESEARCH INVOLVING TRIANGULATION

2.1 INTRODUCTION

I made definite decisions concerning the project from the outset.

I wanted to use videorecordings for the study. The teacher involved would have no say in this matter. If the prospect was too daunting she could choose not to be involved in the project. Another issue that was non-negotiable was the involvement of the children. Once again, if the teacher found this unacceptable then she was free to refuse to be involved.

Other than these two non-negotiable issues I did not have any other "set agenda". I, as an outsider, would be a guest in another teacher's classroom and I felt that it would be up to the teacher concerned what would actually come of the project as far as improving practice was concerned.

I approached Ginelle de Villiers late in August (the third term in Cape schools) to ask her if she would be willing to become involved in the project. She and I had known each other for quite a while and lately we had become more friendly through a group of primary school teachers that had started meeting regularly to discuss our teaching. The nature of the questions and comments she made at these meetings made me think that she would be the right person to ask.

It seemed that Ginelle believed in a democratic classroom where children should be free to grow and develop in an atmosphere of warmth and caring. This turned out to be a mistaken assumption on my part that I would only discover at a much later stage.

I had thought that it would be necessary for the teacher and I to have more or less the same philosophy of education. (Rowland, 1984) I realised afterwards that this is not a requirement at all. However, if the teacher concerned does share the same philosophical standpoint as the outsider, it makes the project more pleasant and a greater depth of questioning and analysis can be achieved. (Rowland, 1984)

If the facilitator sees herself or himself merely as a resource person, there to help make the researching easier for the teacher then I think that a differing philosophy of education would be of no real importance and should not influence the quality of the actual researching.

After talking to me, Ginelle agreed to become involved on condition that the headmaster of the school she taught at did not object. I arranged to see the deputy headmaster in his office on the morning of September 1.

He readily agreed to me working in his school, asking only that the school be kept anonymous for purpose of the write-up.

The school Ginelle teaches at is a large, state primary school for whites in one of the upper middle class, northern suburbs of Cape Town. It has English and Afrikaans classes. (pre-primary to Standard Five.)

The school building has become too small for the amount of children that attend it and there are six "pre-fab" classrooms which have been erected to cope with the "overflow". Ginelle's class is housed in one of these "pre-fabs".

She has a Standard Two (English) class. It is called the Standard 2c class. All the Standard 2 children were streamed at the beginning of the year and it would appear that standard 2c was comprised of those considered to be of "average" academic ability. There were a few children who seemed to be exceptionally bright, but Ginelle said that they had been placed in this class as they had "personality problems" (sic!) and could not cope with the highly competitive atmosphere in the Standard 2a and b classes.

The children seemed enthusiastic about our project and were always ready to contribute seriously and thoughtfully. I never saw anything that could be described as "disciplinary" problems. The children conformed to the image evoked when one speaks of a "well-behaved" class.

There were a few children who seemed to have difficulty in coping with the class discipline as it existed. These, it turned out, were the children (three children in particular) who would make the most contributions during our discussions. (see Hull, 1985b.)

2.2 THE AGREEMENT

Ginelle agreed to having a few of her mathematics lessons recorded on videotape. We would then play these lessons back to the children in her class. She would be present during these playback sessions. We (she and I) would then invite the children to talk about how they had experienced the lessons. These playback and discussion lessons would be recorded: either on videotape or on audiotape.

I would in no way be responsible for providing any lesson material or organising that certain teaching aids be available for the lessons.

2.3 THE EQUIPMENT

It was agreed that I would provide any equipment necessary for the recording and playback sessions. This was not to be Ginelle's responsibility.

The equipment was obtained through the Audio-visual section of the Education Department at U.C.T..

2.4 THE USE OF THE VIDEOCASSETTES AND THE AUDIOCASSETTES

The audiocassettes contain playback and discussion sessions at the school as well as a discussion with Wendy Flanagan, a lecturer at U.C.T., who is also engaged in an action research project. I have used ordinary numerals to refer to the cassettes (1-6). The lower case letter that follows the number indicates which side of the cassette is being referred to.

The videocassettes cover the lessons taught by Ginelle and the playback and discussion sessions. I decided to use two separate videotapes, one for the recording of the lessons and one for the recording of the playback and discussion sessions. I have chosen to identify the videocassettes by means of Roman numerals. The cassette used for the lessons is referred to as (i) and the one used for the playback and discussion sessions as (ii). The numbers that follow the Roman numerals indicate the counter numbers that were noted down while viewing the recordings.

2.5 THE PLAYERS AND THEIR ROLES

2.5.1 The Teacher: Ginelle

Ginelle is a qualified primary school teacher. She was trained at Cape Town Teachers College. This college is considered to be the most progressive and liberal college for the training of white primary school teachers in the Cape Province of South Africa.

Ginelle holds a four year teaching diploma. 1986 was her second year as a Standard Two teacher in primary schools. It was, however her first experience in a very large urban primary school.

It will be noticed that she was at first referred to as Miss De Villiers and then as Mrs Besaans. This was due to the fact that during the September vacation Ginelle was married. The children did not immediately settle down to calling her Mrs Besaans and we had the situation where she was referred to by both surnames by various children.

Ginelle seemed concerned about "dictatorship" in her classroom. She was trying to be as democratic as possible within the rigid, authoritarian ideology of Christian National Education that is the policy of the Cape Department of Education. Given these confines and the confines of her training, (Cape Town Teachers College also resides under the auspices of the Cape Department of Education.) she was doing what she felt she could to create a friendlier, more relaxed atmosphere in the classroom. Creating these conditions is not the policy of Christian National Education. (see Gunter, 1973:141-142, and De Vries 1978: 138, 143-146 and 190.)

She said she had a "democratic way of looking at the children" and she wanted the children to grow and develop as people and not merely as young academics.

Teaching in a school that adheres strictly to this ideology is very stressful to a teacher who wants to see the children growing to be unafraid, confident and assertive individuals. She often said she felt "out" on the staff; that they viewed her as "different".

The dichotomy that existed between what Ginelle felt she wanted the children to experience and that which the state expects of her made her very insecure about how she taught. No-one was available to support and affirm her ideas. This insecurity was to affect our project profoundly because as the project developed and progressed so Ginelle began emphasising discipline.

This dichotomy was clearly reflected in what she said.

Ginelle: "You've got to break them (the children) in." (1b, 321.)

During our discussion at her flat (encounter number 2.6.10.) she said that she would never revert to corporal punishment:

"It takes them a long time to realise if you don't hit them - it's because you don't want to hit them - it's not because you're giving second chances or something." (3a, 30.)

Yet, in the last playback session (encounter number 2.6.22.) Ginelle and the children freely spoke of "Whack-Whack" sessions. (ii, from 3069.)

Ginelle runs her class on very traditional lines. The desks are arranged in straight rows and she said that it was important for her to keep watch on as many children as possible.

Her teaching methods are very traditional and conservative. She does most of the talking, explaining and questioning. She uses the blackboard and the overhead projector frequently as teaching aids.

She goes to considerable trouble to find puzzles and lesson-related activities for the children to complete. These seem to be quite easy and most of the children seem to enjoy completing them.

Although Ginelle disciplines her class quite strictly, it is much more relaxed than most other classes in that particular school.

2.5.2 Myself: Student and Facilitator

As a student, I had to complete this project for the purpose of a dissertation.

My training, as a teacher, was different from that of Ginelle. Instead of following a college course for my primary training I had completed a B.Prim.Ed. Degree at the University of Stellenbosch. The Department of Education at this university follows the ideology of Christian National Education to the letter. I went on to complete a B.Ed. degree in the same department, so by the time I reached U.C.T. I was thoroughly steeped in the ideology of Christian National Education.

This background made me deeply aware of what Ginelle was experiencing as I had experienced many of the same frustrations while teaching in primary schools for whites.

The M.Ed. coursework that I did at U.C.T. brought about awarenesses as to how Christian National Education oppressed and dehumanised the children in state-run schools for whites.

When I undertook to do this project I thought it could provide an opportunity of allowing another white teacher to become more aware of how Christian National Education oppresses and dehumanises.

By taking this stance I had an agenda. However, I had no intention of forcing it upon Ginelle. I hoped my comments and questions would bring her to an awareness or understanding of the situation that existed in her Christian National Education classroom.

I did not reveal this agenda to her so it can be described as a hidden agenda. I hoped that she would become aware of how the children in her classroom were being socialised into bowing down to authority and acceptance by practicing the Christian National Education policy. (see Gunter, 1973 and De Vries, 1970)

I had come to appreciate that there are more personally acceptable ways of teaching and I was interested to see if our action research project would bring about any change within the classroom as it existed.

The fact that a dissertation had to be written influenced the project largely. It was because of this that I found it very difficult, if not impossible to hand over full ownership of the project to Ginelle. If I had been able to hand over ownership she would have had full say in the research that was to be done.

As facilitator, I described the aim of the project as one of improving classroom practice. This was a very vague and ambiguous description of our aim. I envisaged that she would have issues that she would like to examine, concerning her teaching. I had no intention of imposing what I thought was good teaching on her. (See Hull. et al., 1985)

I had to operate all the necessary equipment for the third lesson (encounter number 2.6.22.) and the last playback and discussion session (encounter number 2.6.24.). I found this very difficult to do during the playback and discussion session as I had to concentrate on my task of facilitation as well.

2.5.3 The Cameraperson

Susan Brundrit was to accompany me to the school to operate the equipment. She, too, is a trained teacher and is familiar with classroom practice as it exists in most primary schools for whites in the Cape Province.

I found it useful to have a trained teacher doing the filming. She was able to focus the cameras on situations that a non-teaching person could have interpreted as unimportant: a facial expression here, a gesture there, these are things that can tell the teacher much about how children are experiencing a lesson. Hull (1985b) emphasises that filmed images are not "innocent of theory".

Susan was a valuable source of emotional support and affirmation for me. She was able to give me reasonably honest feedback about how she saw me and my role in Ginelle's classroom. She provided me with ideas concerning interviewing and questioning, placing of cameras, etc. Having her help with all the equipment took a load off my shoulders as well.

TABLE 2.1 ENCOUNTERS

NO.	DATE.	PLACE.	ACTORS.	RECORDING.	REASON.
1.	29 August, 1986 Friday	Ginelle's home	Ginelle, myself	none	Asking Ginelle to become involved in the project.
2.	1 September 1986 Monday	Headmaster's Office (School)	Deputy-Headmaster, myself	none	Request permission to work in the school.
3.	1 September 1986 Monday	Classroom	Ginelle, the children, myself	none	I introduce myself to the class and arrange a suitable time and day with Ginelle.
4.	8 September 1986 Monday	Classroom	Ginelle, children, Susan, myself	video: of lesson 1 (i; 0-1565)	Video-record lesson 1.
5.	8 September 1986	Classroom	Ginelle, Susan, myself	Audio: general discussion. (1a 000-111.)	A general discussion: getting to know Ginelle.
5.	8 September 1986	Classroom	Ginelle, the children, Susan, myself	Audio: of first playback and discussion session. (1a, 112-end of 1a.)	To allow children and Ginelle to see themselves and introduce questioning.

NO.	DATE.	PLACE.	ACTORS.	RECORDING.	REASON.
7.	15 September 1986 Monday	Classroom	Ginelle, the children Susan, myself	Video: of second playback and discussion session (ii, 0000-0955.)	Playback and discussion session on lesson 1
8.	15 September 1986 Monday	Classroom	Ginelle, Susan, myself	Audio: (1b.)	General discussion.
9.	29 September 1986 Monday	W. Flanagan's Office	W. Flanagan, myself	Audio: (2a from 000.)	A discussion concerning the nature of Action Research.
10.	6 October 1986 Monday	Ginelle's Flat	Ginelle, her husband, Mark, myself	Audio: (3a and b.)	General discussion of the project.
11.	13 October 1986 Monday	Classroom	Ginelle, the children Susan, myself	Video: of lesson 2. (i, 1633-2340.)	Recording of lesson 2.
12.	13 October 1986 Monday	Classroom	Ginelle, Susan, myself	Audio: (4a.)	A general discussion

NO.	DATE.	PLACE.	ACTORS.	RECORDING.	REASON.
13.	13 October 1986 Monday	Headmaster's office	Headmaster, myself	None	Re-negotiate my presence in the school
14.	14 October 1986 Tuesday	Classroom	Ginelle, the children, myself	none	I visit the class.
15.	16 October 1986 Thursday	Classroom	Ginelle, the children myself	none	I visit the class.
16.	17 October 1986 Friday	Classroom	Ginelle, the children, myself	none	I visit the class.
17	20 October 1986 Monday	Classroom	Ginelle, myself	Audio: (5a)	A general discussion
18	20 October 1986 Monday	Classroom	Ginelle, the children, Susan, myself	Video: of third playback and discussion session: session: (ii, 1113-2253.) and audio: (5b.)	Playback and discussion of lesson 2, in groups.

NO.	DATE.	PLACE.	ACTORS.	RECORDING.	REASON.
19.	23 October 1986 Thursday	Classroom	Ginelle, the children, the Headmaster, Susan, myself.	Video: of fourth playback and discussion session: (ii, 2318-2715.)	Playback and discussion session on lesson 2.
20.	24 October 1986 Friday	Classroom	Ginelle, the children, myself	none	I visit the class.
21.	27 October 1986 Monday	Classroom	Ginelle, the children, myself	none	I visit the class.
22.	28 October 1986 Tuesday	Classroom	Ginelle, the children, myself	Video: of lesson 3: (i, 2355-3190.)	Recording of lesson 3.
23.	28 October 1986 Tuesday	Ginelle's Flat	Ginelle, Mark, myself	Audio: (6a and 6b.)	Discussion of project
24.	30 October 1986 Thursday	Classroom	Ginelle, the children, myself	Video: of fifth playback and discussion session: (ii; 2718-3412.)	Playback and discussion session on lesson 3.

NO.	DATE.	PLACE.	ACTORS.	RECORDING.	REASON.
25	30 October 1986 Thursday	Headmaster's Office	Headmaster, myself	none	Thanking him for making his school available for the project.

2.6 A CHRONOLOGICAL OVERVIEW OF ENCOUNTERS DURING THE PROJECT.

(See table 2.1)

2.6.1 Approaching Ginelle. (Friday, 29 August, 1986.)

I approached Ginelle because I thought she would be the right teacher to be involved in a project like ours. I spoke to her at her home. I requested her to make herself and her class available for the project. I explained that the principal aim of the project was to "improve teaching practice".

At first she said that she did not like the idea of appearing on video but she thought that it would be a good idea when seen from the point that it might help her teaching practice.

We did not examine and negotiate the term "improving teaching practice". This meeting was not audiotaped.

2.6.2 Approaching the Headmaster. (Monday, 1 September, 1986.)

I telephoned the school and made an appointment to see the headmaster in the morning. As the headmaster was on sick leave I had to speak to the deputy headmaster about the project. I explained that the project entailed the use of videorecordings and audiorecordings. I tried to explain the outlines of the project as briefly as possible to him. I then requested his permission to work in the school.

The necessary permission to work in the school was granted. He seemed anxious, although he stressed that it was because of his concern about the reputation of the school and the effect that the project would have on Ginelle. I wrote in my diary on 8 September: "I am worried by the evident anxiety exhibited by the deputy headmaster."

This encounter was not audiorecorded.

2.6.3 Introducing myself to the class. (Monday, 1 September, 1986.)

I went to Ginelle's classroom and there I introduced myself to the children. Ginelle had told them a little about me and the project. I tried to explain as explicitly as possible what the project would entail.

I asked them if they would be willing to help with the study. They were very excited at the idea of us going to the classroom with all the equipment. They eagerly agreed that it would be very nice to be involved in the project.

They did not question me, but Ginelle told me afterwards that they spent quite a long time discussing me and the project.

I had assumed that they were too young to understand about higher degrees and universities. This proved to be a mistaken assumption. I regretted not sharing this information with them.

No recording was made of this encounter.

2.6.4 The first lesson. (Monday, 8 September, 1986.:i, 553-1563.)

This first lesson was one Ginelle described as a "model" lesson – the kind of lesson that she would teach in front of a college lecturer who would be allocating marks for her lesson. It was to be an introductory lesson to the topic "Time".

Ginelle asked the children to settle down and fold their arms while she spoke. She used a question and answer method to cover a little about the history of time. They covered some aspects concerning the history of time e.g. using the sun and sundials as a method of telling time. They went on to discuss how an hour would be measured in ancient times.

Ginelle used an overhead projector with a transparency depicting examples of a sundial, an oil lamp, an hour glass, a candle and a container of water. She explained to the children how these objects were employed to help tell time. She did all the explanation and discouraged any questioning from the children at this stage by gesturing to them to lower their hands.

After her explanation she directed the lesson towards how time is measured today. A discussion ensued, once more with Ginelle using question and answer technique. The topic turned to watches and how they differ in appearance.

It did not take long before a general discussion started with individual members of the class contributing while the other children sat listening to these contributions: eg.

Odette: "We've got one of those er.. quite old clocks. It was my granny's and my Dad never winds it up, but he doesn't want it... he winds it up so that it can tell the time, but he doesn't want it to make any noise."
(i, 1000.)

Quite a number of children sat listening to these contributions with their hands raised to indicate that they, too would like to make a contribution to the discussion. The children became quite excited about talking clocks. The noise level in the class increased. Ginelle reprimanded them by saying:

"You're getting restless, come on." (i. 1062.)

This discussion continued and a number of aspects were raised e.g. the word "digit" was explained to the children by Ginelle. Alison, one of the girls in the class, explained what she knew about Roman numerals because they appeared on one of the clocks in her home. This type of discussion was terminated by Ginelle.

Ginelle: "Right, attention please." (1, 1213.)

Ginelle then turned to questioning the children as to how many days in a year, how many months in a year, etc. Ginelle then made sure that the children knew the months of the year in the order that they appear on the calendar. She then questioned them about the days of the week; asking questions like: "What day precedes Monday?" and "What day follows Wednesday?" etc.

At this point of the lesson she turned to the text book and opened it. The children reached for their books but were told not to. Ginelle said:

"Uh - uh, close your books. I haven't said anything about ..."
(her voice faded and she did not complete the sentence.) (i, 1507.)

She continued asking questions from the text book until the bell rang and the children had to leave for their physical education period.

2.6.5 A general discussion involving Ginelle, Susan and myself. (Monday, 8 September, 1986.:1a, 000-111.)

While the children were away, Ginelle, Susan and I sat down in the classroom and had a general discussion. We chatted about the children in the class, posters for the classroom and the general tidiness of the classroom.

We felt a little "strange" in one another's company. Ginelle was in a new situation. She was no longer recounting to an interested group of primary school teachers what she thought about her practice. She had actually exposed her practice to the close scrutiny of two outsiders.

This discussion was audiotaped.

2.6.6 The first discussion session. (Monday, 8 September, 1986.:1a, from 111.)

This session was audiotaped. I made provision for some time for the children to see themselves on the videoscreen. They laughed loudly, giggled and made comments. Ginelle and I sat close together while watching and chatted about what we were seeing and other things.

Ginelle said that she had felt very conscious of the videocamera. Ginelle and the class exchanged comments as to what they were seeing. The comments were very general.

After about fifteen minutes I stopped the general discussion and I asked the children if they would mind me asking questions about the first lesson that had been videotaped. I asked Ginelle if she would mind. They agreed, but only after Rian reminded his teacher that she had become very angry once before when she had invited them to write down ideas they had about her lessons.

Rian was the first child to question his teacher about her practice of repeating a given answer to a question. A general discussion developed with some children thinking that it was a good idea.

Collette, changed the topic, saying that she thought twenty-four hours made two days. Susan, the cameraperson, explained to Collette about hours and days.

Ginelle's use of praise in the class for those children who obtained high marks for a test or any other work was then commented on.

After this, the children started discussing certain habits that Ginelle has, some she was aware of and some not.

2.6.7 The second playback and discussion session. (Monday, 15 September, 1986.: ii, 0000-0955.)

I viewed the lesson (encounter number 2.6.6) and noted some issues which, I thought, would encourage the participants to start taking a "new" look at themselves within their life - situation of the classroom. I felt a need to "prepare" for this playback and discussion session. (see appendix A.)

I explained to the children that I would ask questions concerning extracts from the videorecording. I explained that I would ask for opinions and comments from all the participants.

I asked questions concerning the use of vague terms which Ginelle had used during the first lesson e.g. "ancient times" and "in those days".

It was very clear that even at this, the second viewing, the children were still amused at seeing themselves on screen. However, it was not the same feverish excitement of the first viewing.

I ended the discussion on ancient times and asked a question concerning Ginelle's reprimand that they were getting restless and they should settle down.

I said: "Look at yourselves now and then decide why Miss De Villiers said that." (ii, 327.)

After posing this question the children settled down and stopped pointing towards the screen and giggling. They now merely smiled if something amused them, watching the video quite seriously.

Ginelle remained very withdrawn, quietly watching, with her arms folded.

The discussion revealed negative feedback for Ginelle about her carefully planned lesson: e.g.

Claire: "...um, because you are not learning. You are listening to the same old thing." (ii, 399.)

Quite a few comments were made that suggested the children were feeling bored during the lesson. Ginelle reacted with a slight smile but her body language indicated that she was not happy or comfortable with the comments that were being made.

While contributing to the discussion some children looked at Ginelle as if they were trying to judge her reactions to what they had said. Others did not do this.

After some discussion, I asked them what they thought could be done about being bored. The children offered various suggestions. Ginelle nodded her head in agreement to some of these.

Soon, one of the children, Collette, changed the topic to Ginelle's practice of "bribing" the children to be good or to finish work; the reward being no homework for that day.

Gina said that sometimes Ginelle did not do as promised but gave homework anyway. Ginelle's behaviour changed; she frowned and sounded quite angry and defensive.

I noticed her reaction and asked for her thoughts on the matter. I asked her if she thought this practice was a useful one in her class.

The topic was changed. The children said that they did not like being interrupted while working on an exercise. The children discussed how they would like their day to be planned.

Some of the children remained quiet during our entire discussion session. At times these children would share something with the child sitting next to them, in quiet whispers. I could not determine whether these whispers had anything to do with what was being discussed. However, some facial expressions and gestures indicated that some whispers had something to do with the discussion.

2.6.8 A general discussion involving Ginelle, Susan and myself: (Monday, 15 September, 1986.:1b)

We discussed how Ginelle felt about the first and second playback and discussion sessions. (Encounter numbers 2.6.6. and 2.6.7.) Ginelle pointed out that the sessions had a marked effect on her. She said she had become more aware of her physical appearance. She suggested dividing the class into two groups for the next playback and discussion session (encounter number 2.6.17.) She expressed the thought that one playback and discussion session should be conducted in her absence.

We discussed other general teaching issues: e.g. transition periods between lessons, discipline and individual children.

2.6.9 A Discussion with Wendy Flanagan concerning the nature of action research. (Monday, 29 September, 1986.:2a)

Ms Wendy Flanagan is a senior lecturer in the Department of Education at U.C.T. She is involved in a project involving action research. I made an appointment to see her in her office.

I requested her to help me especially as far as the role of the facilitator was concerned. Wendy stressed that I should be facilitating in intellectualising about what was happening in the lived reality of the classroom.

She was able to give me very useful advice and also helped me become more aware as to the importance of the teacher's role in a project such as mine. She stressed the importance of ownership and the democratic nature of action research.

This encounter was audiorecorded.

2.6.10 A discussion concerning the project with Ginelle. (Evening of Monday, 6 October, 1986.:3a and b.)

I arranged with Ginelle to meet her at her flat at a convenient time to discuss the project and her feelings about it. Time at school simply did not allow for lengthy in-depth discussions concerning our hopes and fears about the project.

During this session Ginelle voiced some of the hurt and anxiety that she had experienced during the first playback and discussion sessions. (encounter numbers 2.6.6 and 2.6.7.) She expressed some of the awarenesses and insights she had arrived at too.

Ginelle did most of the talking and spoke at length about various other issues. These included: other teachers and their practice at the school, discipline and the children and the participation of parents in the education of their children. She spoke about the schooling system and the headmaster of the school, too.

I asked her what she would like to make of the project. I said:

"Where would you like to take it from here." (3b 572.)

She made a few suggestions regarding her next lesson and issues she would like to investigate.

This discussion session lasted well over the ninety recorded minutes on the audio-tape. Mark, Ginelle's husband, sat in on some of the discussion often offering interesting and refreshing points of view.

2.6.11 The second lesson. (Monday, 13 October, 1986.:i, 1633-2340.)

The topic was still "Time" but the class were now learning to tell time. It was what Ginelle termed an "ordinary lesson."

The lesson started with Ginelle telling the children to write the heading and date in their maths books. She set the children fourteen problems concerning the telling of time. Illustrations of clock faces indicating different times were printed on a transparency which she put on the overhead projector for the class to see.

The children had to copy the indicated time from the transparency onto the cardboard clocks which they had made prior to the lesson. They had to work in pairs and show each other the time and then write the time out in words in their books.

Many of the children seemed to be unsure of what they were supposed to be doing. While the children were busy, Ginelle walked about the class helping various children. Some of the children appeared to be helping each other and sharing their knowledge while others were working strictly on their own.

When most of the children had finished the set exercise Ginelle said:

"You can actually test your friends with the clocks. Give them some times and test them. Give them the hardest ones you can possibly think of." (i, 2062.)

Having been challenged thus, the children frequently went up to her and asked for her help to solve some of the problems that they could not.

When everyone in the class had finished all the set problems, Ginelle said:

"Take out your maths books and let us quickly mark them." (i,2197.)

They exchanged their books to do the marking.

Together, Ginelle and the class went over all the given problems. She affirmed or negated answers given to her by the children.

The children were then asked to stand up if they had all the answers correct. Then she asked those who had one answer wrong to stand and then those who had more than one answer wrong had to stand up. Everyone was then told to sit again.

Ginelle then posed a few problems to the class using a cardboard "clock". The bell rang and the children had to leave for physical training.

2.6.12 A general discussion involving Ginelle, Susan and myself. (Monday, 13 October, 1986:4a and b.)

While the children were at Physical Education the three of us had an informal conversation in the classroom. We spoke about the pro's and con's of windsurfing, squash and jogging. More "teaching-related" topics covered individual children and arranging a suitable date for the next session.

It was during this session that I requested her permission to visit her and the class regularly on an informal basis. I wanted to visit the class and be of help if I could.

This session was recorded on audiotape. It was, however, a very indistinct recording and when I wanted to transcribe it I found that I could not make sense of much that had been said.

2.6.13 A meeting with the Headmaster. (Monday, 13 October, 1986.)

The headmaster had returned to the school at the beginning of the new term and, although he was aware that I was working in the school, I felt it necessary to speak to him about the project.

I made the necessary appointment to see him in his office. I repeated most of what I had explained to the deputy headmaster and he seemed satisfied with the terms we had agreed upon.

He asked permission to attend one of our sessions. This seemed a reasonable request but before I agreed I asked Ginelle if she would object. She saw this as an indication that he was interested in what was happening in her classroom and readily agreed to it.

I did not record this discussion.

2.6.14 **Visits to the class.** (Tuesday, 14 October, 1986; Thursday, 16 October, 1986 and Friday, 17 October, 1986.)

2.6.16

I decided to visit Ginelle's class (with her permission) to try and establish a better relationship with the children and Ginelle.

Going to the school only on "video" days seemed very synthetic and I had not perceived a trust relationship developing amongst ourselves as participants.

I helped the children with work and I helped Ginelle by taking individual children for their reading lessons while she was busy.

I spent some breaks with Ginelle in the staff room while others I spent with the children on the playground. This gave me the opportunity of chatting informally to both Ginelle and the children. Rarely did our topic of conversation turn to that of the project. I was able to brush-up on my skipping abilities, as well!

These days, spent informally in the presence of Ginelle and the children were well worth the effort. I found this time spent with them enriched our relationship.

I found it enjoyable to be involved in a classroom situation without any of the heavy responsibility that goes together with formal teaching in state-run primary schools for whites.

2.6.17 **A General discussion involving Ginelle and myself.** (Monday, 20 October, 1986.:5a.)

We negotiated the date of the final playback and discussion session of the project. I explained how I envisaged the playback and discussion session that was to take place the following period.

Ginelle spoke about more awarenesses and insights that she had gained from the project. She indicated that she appreciated my informal visits to the classroom very much.

She expressed that it had been a good experience for her to share her teaching reality with her husband, Mark, during our discussion at her flat. (encounter number 2.6.10.)

She spoke of individual children in the class and her relationship with them quite openly to me.

2.6.18 **The third playback and discussion session.** (Monday, 20 October, 1986.:ii, 1113-2253 and 5b.)

For this playback and discussion session, the class was divided into two groups. One group was comprised of those children who had shown that they would contribute easily and the other group comprised of those children who were termed "the quieter ones."

It was at Ginelle's request that we split the class into these two groups as she was concerned about the fact that there were several children who had not contributed towards our last two sessions.

Susan would lead the "outspoken" group and their session would be audiotaped. (See below.) Ginelle and I would remain with the "quieter" ones and our discussion session would be videotaped.

I chose to show the class (as one group) the introductory part of the second lesson. (Encounter number 2.6.11.) I posed a question concerning the instructions that Ginelle had given them. They then split up into the two groups. Susan's group sat near the back of the classroom and the other group sat near the front of the classroom.

1. The "Quiet" Group. (on videotape)

I questioned the group about their behaviour, as seen on the videotape, while Ginelle was issuing instructions on how to go about their work. The discussion was not as animated as before when the whole class had taken part. This could be ascribed to the fact that these were the "quieter" children: the children who were less willing to share their thoughts.

They named a number of things that children had been doing while Ginelle was giving instructions.

I asked them to say what they thought they should have been doing while Ginelle was issuing instructions. I asked them about Ginelle's expectations of their behaviour while giving instructions.

I then changed the topic and asked them if they felt there should be a special time set aside for getting their books ready i.e. writing the date, drawing a margin and writing the required heading.

The children shared various views and offered a number of suggestions. I asked Ginelle to share her thoughts concerning the children's suggestions. Ginelle and the children discussed the advantages and the disadvantages of some of the suggestions.

This discussion became side-tracked when one of the children raised the issue that sitting next to another child who fiddled disturbed her concentration. The children discussed this and they started making accusations at certain individuals.

I terminated this by asking:

"Why did you not know what you were supposed to be doing?" (ii, 1835.)

The children responded that they just did not know what they were to do.

Ginelle then asked them why, when she had enquired whether they had understood or not, they had all said "yes." She wanted to know why they were not prepared to indicate to her that they did not understand what she said.

She told them that she would always be willing to repeat her instructions,

We shared the idea that if the children did not understand they should tell Ginelle, so that she could understand their experience of her instructions.

I then asked them to watch another section on tape. This was the recording of Ginelle where she was actually giving the instructions on how to complete the exercise she had set. I asked them to focus on the words that she was using and whether they understood what she was actually saying or not.

We discussed why some children understood what they were to do and why others did not understand. I asked them if they could think of reasons why they could understand instructions at some times and then not at other times.

Our discussion then turned to the reason for videotaping the session and who was benefitting from it.

The last part of the session became a generalised discussion between Ginelle and the children. The three girls who had been sitting very close to the microphone became very intrigued by it. Ginelle asked them what they thought they were doing and they replied that "it feels nice!"

2. The "Outspoken" Group. (audiotape 5b.)

Susan's discussion with her group was very interesting in that many more negative things were said about their teacher. The children gave vent to many complaints. There were quite a number of things that Ginelle did that irritated them. They seemed to feel safer to air their views without their teacher being present.

They very honestly told how they had mastered the "hidden curriculum" concerning some issues. Susan asked them how Ginelle reacted when a child would ask for a renewed explanation. Rian said that she explained again and even if the child still did not understand, that particular child would go back to his/her desk and pretend to write.

Their discussion was more candid concerning why children would not ask Ginelle to repeat explanations.

They discussed their worries and anxieties about tests and examinations and cheating to obtain better results.

This kind of candid discussion could be very useful to a caring teacher if the children gave the facilitator permission to share it with the teacher. The contents of the transcription of this tape opened my eyes to the necessity of talking to the children without the teacher being present, and then negotiating what should be made available to the teacher.

2.6.19 The fourth playback and discussion session. (Thursday, 23 October, 1986.:
ii 2318-2715.)

Ginelle invited the headmaster to be present at this session. He stayed for about half of the session. It is difficult to say what effect his visit had on our discussion. I do, however, think that his presence influenced both the behaviour of Ginelle and the children.

I say this because, where I would usually start the discussion, Ginelle opened the questioning. Her questions and comments were all related to discipline. I am sure that the headmaster's presence influenced her questions because there is a heavy emphasis on strict control and discipline in the school. She asked the children to suggest solutions to solve the problems she had just mentioned.

I acted as a "chairperson" and summarised their suggestions when the discussion drew to a close. They agreed to adopt the one suggestion offered by Matthew.

I again showed them the introduction to the second lesson where Ginelle's vague instructions had confused many of the children. I asked them as a whole group why they had not understood.

Various children contributed what they thought could be the reasons for others not understanding the instructions.

One child suggested that some children might feel embarrassed to ask again as others might think that they were stupid. We discussed how such children may feel and if it was necessary for them to actually feel embarrassed.

I asked those who were sure they knew what to do once Ginelle had given the instructions, how they knew what to do. Various children contributed and a discussion ensued.

The discussion revealed that there were children in the class who competed with each other to see who could finish his/her work first. I asked one child in particular why it was that his work was always finished quickly. I asked him to explain to the class how he went about working quickly and efficiently.

Lisa, a girl in the class, objected to our emphasis on working quickly. She said:

"... so you must not rush." (ii, 2708)

Our session ended on this note.

2.6.20 and 21 General visits to the class. (Friday, 24 October, 1986 and Monday,
27 October, 1986.)

Once again, with Ginelle's permission I visited her classroom and helped her there. These visits basically followed the pattern of those described in 2.6.13 - 2.6.15.

Again, I found them richly rewarding because of the closer contact with both Ginelle and the children.

2.6.22 The third lesson. (Tuesday, 28 October, 1986.:i, 2355-3190.)

The topic by now had changed to "Measurement".

The lesson started with the children having to mark work that they had done the previous day. Individual children had to verbally supply answers to the given problems. Ginelle affirmed or negated these answers. Some discussion took place when children disagreed with answers that were supplied. Ginelle explained why the answer was wrong or right. The class covered twenty problems in this way.

Ginelle then told those that had full marks or only one problem wrong that they would be awarded a star.

Once the children had calculated their mark out of twenty, Ginelle asked those who had obtained full marks to stand up. These children were warmly praised by her and applauded by the rest of the class. The children who had more than four answers incorrect were asked, individually, what their score was.

Ginelle asked the children to sit on the carpet in front of the classroom. Once they had settled down on the carpet she started, saying:

"Right, are you ready to learn?" (i, 2595.)

Ginelle revised work that they had already covered. She explained how to convert kilometres to metres, metres to millimetres and then how to convert millimetres to metres and metres to kilometres.

She used a question and answer method for most of the lesson. Often, it would be necessary for her to supply the answer to the question she posed.

After this, she set the children six problems to solve in their mathematics work-books. Many of the children seemed unsure of how to solve the problems. Ginelle was inundated with requests for help from the children.

A few very bright children finished the problems quickly, while the others struggled. For the rest of the lesson Ginelle had to help children who needed further explanation as to how to solve the problems.

2.6.23 A discussion with Ginelle. (Evening of Tuesday, 28 October, 1986.:6a and b.)

I arranged to meet Ginelle at her flat to discuss the progress of the project. We discussed my role as facilitator and she stressed how much safer she started feeling since I had become a regular visitor to the class.

We watched the recording of the third lesson (encounter number 2.6.20.) This focussed our attention and we spoke more about what was actually happening in the classroom and less about general issues.

We agreed on issues that would be raised during the next playback and discussion session. (encounter number 2.6.24.)

Mark, her husband, sat in on the entire discussion. Once again I realised the value of comments made by an uninvolved yet interested outsider! He told me how much he appreciated being able to see what Ginelle did during her working day.

2.6.24 The fifth playback and discussion session. (Thursday, 30 October, 1986.: ii, 2718-3412.)

This discussion took place after Ginelle and I had viewed the lesson at her flat the previous evening. While we were viewing the recording Ginelle decided that she would like to ask the children why they disturbed her so often while she was busy writing on the board.

Ginelle asked the children to sit on the carpet in front of the class so that they could see the monitor. Her tone of voice indicated that she was angry and/or frustrated.

She asked them to watch how many times she had been disturbed while she was writing the exercise on the board. She reminded them of the "rules" that applied in their class.

I asked the children why they thought Ginelle was disturbed so often. The children suggested various things that they might need to do or know.

We discussed this behaviour and what the outcome of this behaviour was. We explored the idea of how Ginelle felt about these disturbances.

I asked them if they thought that this was the right time to ask for help. Ginelle then described her frustration. She said that she was feeling frustrated because she knew that the brighter children were keeping up with her, as she was writing on the board, and the interruptions kept her from putting the complete exercise on the board for these children. She said she thought that these children were bored because they finished the sums as quickly as she put them on the board. This made her anxious.

One of the children then chose to change the direction of the discussion. The problems of staying in during break and corporal punishment were discussed. What took place cannot be described as discussion or discourse. It became a communique as Ginelle took control of the discussion.

The class was very subdued and answers consisted of many yesses and no's-

I asked the children to suggest ways of stopping the behaviour considered by Ginelle to be disturbing while she was writing on the blackboard. They offered varying suggestions. One of the girls said that it did not help making suggestions or rules in their class because even if it was mentioned that a rule had been broken, nothing was done about it. She said:

"It was about two months ago and we had this rule in the class to stop talking and we must whisper and everybody started talking.... and I reminded the whole class and I told them to "shush" and they went "Ag man". They didn't take any notice." (ii, 3123.)

The session ended with a general discussion on how children could occupy themselves once they had finished an exercise and others were still busy completing it. The discussion was varied and suggestions abounded.

They started discussing the various "illegal" things they do while waiting for others to finish. Ginelle told them that they were wasting their time and they should rather occupy themselves by reading.

At this point the period was almost at an end and a general discussion developed concerning visiting the local library.

2.6.25. Thanking the Headmaster. (Thursday, 30 October, 1986.)

After the playback and discussion session (encounter number 2.6.24.) I requested permission to speak with the headmaster. He invited me into his office where I thanked him for allowing me to work in his school.

No audiorecording was made of this encounter.

2.7 ISSUES THAT CONCERNED ME AT THE OUTSET OF THE PROJECT.

From the beginning of this project it worried me that I would be using another teacher and her class for the purpose of obtaining a Masters Degree. It could be seen as a selfish motive for engaging in action research and could be interpreted as not in keeping with the spirit of action research. (Flanagan. 2a)

Another issue that concerned me was whether I would do irreparable harm to Ginelle's confidence as a teacher. As it turned out I think the project actually helped her gain confidence as a teacher, with the added advantage of gaining a little status within the school by being the teacher involved in a research project.

Other issues that concerned me initially were: would I be able to cope with the complex relationships that would most certainly arise during the project and would enough come from such a project to enable me to write the required dissertation?

2.8 EXPECTATIONS.

At the beginning of this project, I was rather unsure of what to expect. However, I had hopes and expectations concerning the project.

I hoped that the project would encourage the teacher concerned to take a new look at the way she taught and the effects her teaching had on the pupils. I hoped this reflection on her practice would encourage her to suggest and try new ways of doing things in her classroom.

I hoped that the children concerned would be given the opportunity to have a say in what they were experiencing in their lived reality of the classroom.

I hoped that the teacher and children would really start talking about their shared reality, opening it to closer inspection. I hoped to set a scene in which true dialogue, in the Freirian sense, would come about.

2.9 THE WRITE-UP.

For this dissertation I have elected to isolate two of what I consider the most important processes of the project: that of the playback/discussion sessions and that of negotiation. This is not to say that there are not many other very important issues that warrant closer attention. Other themes that I think are important would be: the relationships that developed and grew during the project; child participation in discussion sessions; teacher participation in the project; my role as facilitator; interviewing; to what degree does the teaching system, within which the teacher operates, affect a project like this; and, the use of equipment.

I have used a thematic approach for the analysis and the write-up. Using this approach helped considerably to focus the analysis of the enormous amount of data that was generated by the videorecordings and audiorecordings. It is important to always be aware of the context in which things are said and not to treat sections of speech in isolation, as one might be tempted to do when approaching data thematically. I found that transcribing the audiotape recordings helped me overcome this problem to a large degree.

In order to remain authentic I have chosen to write the dissertation in a less formal style than is usual for an academic dissertation.

I believe that I have been honest in what I have written in that it is what I experienced and what seemed right for me. This, then, is an authentic account of what I observed, experienced and learnt during this project.

CHAPTER THREE

THE PLAYBACK AND DISCUSSION SESSIONS.

3.1 INTRODUCTION

The issue of playback and discussion sessions is vital to the entire process of action research involving triangulation. It is through these discussion sessions that the democratic nature of action research can be brought to life and carried through into the life-world of the classroom. These sessions demand that the participants come together in a face-to-face situation and it opens up the possibility of informed dialogue concerning various practical but crucial issues between those concerned. (Morrison in Chanan, et al., (eds), 1975)

Carr and Kemmis (1986:199) say: "Ultimately the aim of action research is to involve all the participants in communication aimed at mutual understanding and consensus, in just and democratic decision making and common action toward achieving fulfilment for all."

It is during these sessions that the teacher and the children can come together and discuss the reality that exists in their life-world. By means of collaborative dialogue with the teacher, the "conscripted clientele" (the children in the class) can be given an authentic say in the learning and teaching that makes part of their socially constructed reality. (Hull, 1985b:24)

It is during these discussion sessions that the constraining and controlling mechanisms of the hidden curriculum can be exposed and scrutinised by the participants. It is only when the participants in the educative process become aware of the hidden curriculum and how it influences their reality within the school that they can start to manipulate it so that they may be in control of their education. (Hull, 1985a)

It is only recently that educationists realised the value and the democratic principle that lies behind inviting the children to participate in the action research of the teacher's practice.

Kelly, who pioneered personal construct theory, was renowned for the fact that he often said that if you find the behaviour of another person puzzling , why not ask him/her the reason. More than likely the person concerned will tell you.

However, these discussion sessions can degenerate into a situation where the teacher makes a few paternalistic gestures towards the children in the classroom. So, in order to be authentic all participants must be made aware that they are free to criticise or comment on equal terms. (Carr, et al., 1986.)

Nixon, et al., (1979) indicates that a mutual respect and a feeling of equality is necessary amongst all the participants for there to be successful co-operation. The different backgrounds and experiences of the participants should enrich and stimulate the investigation of the mutual problem.

Elliot (1983) says that it is only by getting the teacher and the children to actually voice their judgements about certain situations their prejudices are brought to light concerning the situation. It is when these prejudices are opened for discussion that the teacher and the children can begin to understand their actions and their situations as it has been socially constructed and only then can the prejudices or judgements begin to be modified.

Teachers are being recognised as "the expert" of the classroom, yet the children, who share that reality with them daily, are not enjoying the same status. It is while teachers and children do not share their reality by engaging in authentic dialogue about it that the division will continue to exist between schooling and education. "Teachers and pupils must find a way to meet each other if they are to escape the destinies that are immanent in the situation they inhabit." (Hull, 1985a:7)

Triangulation can expose practices that have become entrenched in our schooling system; practices that have a limiting effect on "rational communication, more than just decision making and access to an interesting and satisfying life for all." (Carr, et al., 1986:194.)

I feel the discussion sessions that took place in our project could have been the starting point for Ginelle and the children to start examining and questioning their taken-for-granted assumptions about their lived reality within the classroom.

Pupils can make a valuable contribution to the teacher's research. This is borne out by a teacher cited by Hull (1985b) The teacher said that she was amazed at the perceptive comments made by the children concerning themselves, the lesson and the teacher. She was surprised at how much they noticed about that which went on around them. Baker (in Holly and Whitehead, 1986) emphasises, too that the children concerned in his project were most serious, supportive, interested and helpful.

In South Africa, however, the Christian National Educational ideology which is the educational policy for all "white" state schools, does not encourage the teacher and the child to become too friendly and intimate. (see Dovey, 1984.) In most cases there is a certain "distance" between the children and their teachers.

The teacher who would like to bring about the feeling of equality amongst the participants as described by Carr et al., (1986) would have to work very hard at it. The teacher would have to establish a friendly and warm atmosphere in the class. She would also have to encourage and legitimise comments, questions and criticisms from the children. If this could be achieved then the teacher would be creating a situation within which true dialogue could occur. It is vital that the children feel safe enough with their teacher to criticise and comment on classroom practice as this situation is risk-laden for all the participants.

It must be remembered that in our "white" state schools a warm, friendly relationship between teacher and child is frowned upon. The teacher who is willing to allow this friendly, warm atmosphere to develop in his/her classroom

would , in all probability, be made to feel "different" amongst other staff members. The headmaster would probably enquire if she is experiencing "discipline problems."

Children's evaluation can be frank and sobering. (Jackson in Nixon (ed),, 1981.) But it is a shared risk as the teacher and the children are visible in a new light to the entire group. (Hull, 1985a.)

The risk for the teacher is different when the children and not another peer are involved in the action research. Teachers researching with peers tend to look for better ways of doing that which is already being done. They tend to pose the question: "How can we do it better?"

When the children are involved they tend to ask uncomfortable questions. They are likely to ask the question: "Why must we do this at all - and this way?" (Hull, 1985a:4)

Only this kind of questioning can bring the relationship between learning, teaching and schooling out into the open. It can then be discussed by the teacher and the children. When this happens the teacher and the learner can enter into true dialogue about their shared experience of their lived reality of the classroom. Involving the children in dialogue concerning evaluation of classroom practice sharpens their own understanding and the teacher's understanding of the classroom experience. (Jackson in Nixon (ed), 1981) And then from there they can ensure that teaching and learning are democratized.

Hull, et al., (1985) propose that the facilitator should be a disinterested party and is merely there as a help and resource person should the teacher need it.

It is interesting to note that Beals (in Walker, et al., 1979.) suggests that if one attempts to be a dispassionate observer the data will be distorted as one is acting in an "unhuman" manner. However, it is recommended that the participant-observer try to limit her/his passion and involvement.

+ Carr, et al., (1986.) say that the facilitator should not change the main aim of her/his role. She should rather try to create a situation where an awareness or understanding of practice arises. In other words the facilitator intervenes in the action research situation. The facilitator must very sensitively and subtly question and comment on practice.

The facilitator must be empathic. This empathy must extend to the children and the teacher.

So, by means of these playback and discussion sessions I, as facilitator, was hoping to bring about a situation where Ginelle and the children could engage in true dialogue and share their thoughts about the lived reality in their classroom situation and, thereby, lay open for inspection the many taken-for-granted assumptions that existed in their classroom.

In our project, the participants within the playback and discussion sessions were the following:

1. myself, as facilitator;
2. Ginelle, as teacher - participator; and
3. the children as pupil - participators.

The part/s played by these participants and how they influenced the playback and discussion sessions warrants closer attention.

3.2 ON BEING A FACILITATOR

There are differing ideas about what a facilitator should be or do. As indicated in the introduction, one view is that the facilitator should be a disinterested person and only act as a resource person for the teacher when necessary (Hull, et al., 1985.) Carr, et al., (1986) suggest that the role of the facilitator should be one where she/he creates an awareness or understanding.

I realised the value of each of these approaches, but because of the situation as it exists in the South African schooling system, I felt the need to combine the two ideas. White teachers trained at most of our training colleges and even at some of our universities go into the teaching practice with very little critical thought of that which lies behind the ideology of Christian National Education.

I saw these playback and discussion sessions as a valuable opportunity of confronting Ginelle, the children and myself with the reality that existed in their classroom. I hoped that I would have the necessary insight and ability to raise crucial issues that could be discussed or disregarded, whichever the other participants preferred.

3.3 INITIAL RESPONSES TO THE PLAYBACK SESSION: Monday, 8 SEPTEMBER, 1986.

(refer to encounter number 2.6.6 and 1a from 112)

The first playback/discussion session was audiotaped. I did not have a set agenda of questions or comments. Previous experience had taught me that the teacher and the children involved in the videoing needed time to laugh and giggle at the images before them. The participants need time to make general comments, as well. Giving them the time to do so helps them to alleviate much of the tension that is created on seeing their own images.

I regretted not having insisted on a videorecording as I feel it is important to actually see how the children and teacher react to their first experience of seeing themselves on screen. Both the teacher and the children communicate their feelings by facial expressions and gestures. A great deal of valuable information concerning gestures and facial expression had been lost.

I noted in my diary on September 8: "I have decided to use a VCR for the playback sessions as a lot is lost on the audiorecording."

The children reacted as I thought they would with loud giggles and comments. Some of the comments:

"There you are!"

"Look at his face!"

"There's you!"

"There's me!"

"Over there!" (1a from 119)

The children also learnt that they could not deny certain behaviour. Ginelle commented at one stage that Tudor, one of the boys, was dancing. Tudor retorted:

"No, I wasn't dancing."

to which another boy said:

"Yes, you were."

Children react strongly to seeing themselves on screen for the first time. Hull (1985c:5.) cites children who said: "It's a shock." and: "Yea, but is that how other people see yer? We don't know, do we? I might see you as you are to me and they might see you different."

Paul made a remark about Ginelle's physical appearance. He said:

"Big nose." (1a, 200)

Ginelle replied:

"Wait till you see yours, Paul." (1a, 201)

It would seem that children of this age group would not hesitate to pass comment on their teacher's physical appearance and it certainly had an effect on the teacher concerned in our project. Teachers would have to be made aware that this could happen so that they could prepare themselves to deal with the criticisms and comments. Teachers of primary school children are usually aware that the comments of the typical primary school child can be disconcertingly frank and candid.

Ginelle reacted very defensively to Paul's remark. It was not easy for her to accept the criticism. Later, during the same session she actually directed our attention to this issue when she saw Paul's projected image. She said:

"Look at your nose, Paul, good gracious, it's standing out." (1a, 227)

It was necessary for her to adjust to the idea of seeing herself on the screen. It was not easy for her to accept the criticism of her physical features from Paul. This seemingly, innocuous remark made by a ten-year-old had a marked effect on his teacher.

Ginelle's comments mostly referred to the children and their behaviour, e.g.:

"Where's Tudor and Paul - are you on there?"

"Look at him (Tudor) dancing!"

"Lara with the pencil in her mouth!"

"Yes, Mathew, fiddler!" (1a, from 117)

It was interesting to note the difference in comments. The children's comments hardly ever centred on their physical appearance. Their comments seemed to focus more on the behaviour of certain individuals. The comments made by Ginelle quietly to me, sitting next to her, all focussed on her own physical appearance especially her posture.

While they were viewing the recording, Ginelle and I were sitting next to each other chatting. This might have prevented her and the children from fully sharing this experience as an intimately shared one.

Baker (in Holly and Whitehead, 1986) said that he found this period of viewing lessons with the children of his class to be a shared and pleasurable experience. They could share the groans that were uttered when they saw themselves on the screen, they enjoyed laughing together at the fast forwards and rewinds and they were able to share their embarrassment and pleasure. Together they were able to share the feeling of being vulnerable. He (Baker) emphasises that it was a "positive influence" on his relationship with the children.

As the project developed and the children and Ginelle became used to their images being projected on screen, so their attention began to fix on actual class-room behaviour, and less on themselves.

3.4 THE MAIN ISSUES ARISING FROM THE PLAYBACK AND DISCUSSION SESSIONS.

The playback and discussion sessions covered many issues. Some were superficial yet others were crucial issues to the education of the children.

I have chosen to isolate examples of issues that were crucial to the various participants of the project. The descriptions that follow services to show how the sessions were conducted. I have tried to convey the type of questions and comments that were made as well as the atmosphere that prevailed during these sessions.

3.4.1 Issues initiated by myself, the facilitator.

As an observer during Ginelle's lessons I had experienced the children as being bored. Their boredom was evident from the lack of participation in the lesson. They were easily distracted. During the first lesson (topic: Time, Monday, 8 September, 1986. encounter number: 2.6.4.) Ginelle reprimanded them to settle down and to stop fiddling.

This seemed to me to be a crucial issue. The children seemed to be uninvolved and their concentration wandered easily.

Ginelle was obviously aware that the children were not paying attention as she would like them to and I assumed that was why she had asked them to stop fiddling. I assumed too, that the children were fiddling because they were bored.

As facilitator, I suspected that this would be an issue that would be of importance to the children and their teacher. Discussing this issue would give the children and teacher time to reflect on the matter. Discussion could help the participants to understand how they had experienced this lesson.

I introduced the matter by saying:

"Now let me tell you why I want this one...um... You had all been very good. The whole lesson you had all been sitting very quietly and then Miss De Villiers picked up that you were getting restless. And she says: "You're getting restless, come on." Look at yourselves now and decide why Miss De Villiers said that. (encounter number 2.6.7.ii, 288.)

We replayed the extract and then I said: "There she says: "You're getting restless, come on." Why, do you think, she says that?" (ii, 379.)

The children reacted with various comments: (c and the number that follows indicates the contributions of different children.)

c1 : "Everyone wants to keep on saying what he wants the er um to say. The person says what he's supposed to say." (ii, 382)

me : "Any other ideas?" (ii, 390.)

c2 : "... fiddling and all that stuff. She says, "Stop getting restless." because everyone started fiddling, they don't listen." (ii, 392)

c3 : "You're not... you're not learning. You're getting tired of listening to the same old... the same thing." (ii, 401)

Celeste: "... we're doing too much of the same thing and we're getting cross so... so... we were talking too much." (ii, 407)

me : "Why were you getting cross, bored?... and then what do you start doing when you feel like that?" (ii, 414.)

Mathew: "Fiddling." (ii, 424.)

me : "What do you mean by "fiddling"? It sounds as if..." (ii, 425)

c1 : "Play with things."

me : "What do you play with?"

c2 : "Pencils and that."

me : "Pencils and what else?"

So I continued to keep the discussion closed by the questions I asked. They were not discussing the issue at a deeper level, saying why they felt themselves to be bored. I tried to get them to think about the issue again by repeating the question. This time, one of the children said:

"Just because you get bored." (ii, 446)

I did not realise the potential of this answer and instead of opening up avenues of discussion, I seemed to close them with the next question:

"What does it mean when you are bored?" (ii, 447)

From here, we spoke in "circles", as my questions and remarks encouraged them to repeat many of the things they had said as can be seen from the following extract:

Alison: "Sick and tired of hearing other people." (ii, 450)

Bianca: "You want to do something. You fiddle.."

me: "I've got two already. You're sick and tired of listening. You want to do something."

Collette: "... You feel bored because you've got nothing to do. All you do is hear the teacher talk and our teacher.. our the teacher doesn't actually answer us. She answers somebody else, and you get sick and tired of it."

me: "She answers somebody else, you mean that when somebody asks her a question you feel as if you have to wait until that question is finished?"

Collette: "Yes and you get all bored and you've got nothing to do so you start fiddling with the rubbers, the pencils, the..."

me: "Oh, that's interesting, Collette." (ii, 483.)

I managed to raise the issue of boredom during a lesson. Considering the spontaneous reactions of the children to the lesson it had not been a difficult task to raise this issue. The children who became involved in the discussion seemed very serious about the things that they had started saying. I raised the question as to how they thought this boredom could be relieved and they made suggestions and once again I seemed unable to give them the space to explore their thoughts, allowing the discussion to develop and for meaningful communication to start taking place between themselves and their teacher.

I invited them to think of possible solutions to this problem. They offered a few suggestions but they were not really encouraged by their teacher. Most of the time she stood very quietly and hardly looked at the children while they made their contributions. One of the children had the following solution to offer:

"Miss De Villiers writes down all the things we have to do for one day. And then all we have to do is talk to Miss De Villiers ... like we finish all the work we plan to do and then we have time for other things." (ii, 778.)

This suggestion was negotiated and it was actually tried out over the next two days. But because I was not there to see how it progressed I had to take Ginelle's word that it failed, because the slower pupils could not cope. We never returned to this suggestion to discuss it in further detail.

During the next playback and discussion session (encounter number 2.6.18.), this same issue of being bored in the class was raised. It was given as a reason for the class not paying attention while Ginelle was issuing instructions. Natalie said:

"We were talking. We were bored." (ii, 1592)

I seemed to shy away from the issue that Natalie raised as I asked the children to focus their attention on their actual behaviour. Immediately they said that they had been fiddling with objects. This was a "link" to the previous discussion session (encounter number 2.6.7.) Instead of allowing them to discuss the reason behind this behaviour and what could be done about it, I led them to think of ways that they should behave so that they would be more acceptable to their teacher.

Another issue that became very important was one regarding discipline. Viewing the videotaped lessons gave Ginelle the opportunity to see the class in terms of what she regarded as undesirable behaviour.

Because of the negative feedback that I received from Ginelle during the second playback and discussion session (encounter number 2.6.7.), I now started trying to make the children aware of the fact that maybe Ginelle was not the only one who was doing "wrong things" during lessons. I did this not because I believed it to be true but I thought that Ginelle needed me to support her and protect her from the criticisms that the children levelled at her.

My sympathies were at this stage more with the children than with Ginelle, but I felt that if she had become more antagonistic of what was happening all further discussion would be doomed. I engaged in some very uncharacteristic behaviour because of this. I (very sternly) said to the children:

"Just look there. Mrs Besaans is talking but if you look at yourselves, just watch... none of you are sitting and listening to Mrs Besaans. You're all either busy writing already or... Why, I want to know why you're doing that." (ii, 1308)

It is evident that I have chosen to "take sides" and it is obvious whose "side" I have chosen.

We played the extract twice. I then continued using an accusing tone of voice as I said:

"Mrs Besaans has said: "Right", that means, I think, she wants to start her lesson but now look at everybody. Just look at them. (Here I pointed to various individuals who were not paying attention.) Mrs Besaans hasn't said anything about getting started with work yet." (ii, 1415)

It seemed that the children felt comfortable and safe enough to raise a comment that could justify their actions. Claire said:

"... (inaudible) and ruling a line and writing the date we could also be listening to her." (ii, 1454)

Other children said that this would be how they normally approached the task of settling down to do what would be a revision type lesson that went together with a new exercise.

I did not allow the discussion to continue and develop but rather chose to get the children into the groups that Ginelle had decided upon for that particular session. (encounter number 2.6.18.) I wanted the discussion to continue in the group situation that Ginelle had proposed.

I encouraged them to think of ways of changing their behaviour so that it would be more acceptable to Ginelle instead of allowing the group members to discuss the reasons behind this type of behaviour.

me : "What should've you been doing?" (ii, 1655)

The discussion then continued along these lines for quite a while and no real dialogue was established where teacher and children were coming to an agreement about the situation.

My next questions seem aimed at getting the children to suggest ways that they could conform their behaviour to Ginelle's expectations.

me : "When do you think you should have time to do things like drawing your margins, numbering and sharpening your pencils?" (ii, 1682)

and

me : "What can be done to stop you people from drawing and talking and ..."
(ii, 1700)

This issue of behaviour and discipline was emphasised at the next playback and discussion session when the headmaster was present. (encounter number 2.6.19.)

Ginelle took the lead and I had very little control over what was said concerning this issue.

During the last playback and discussion session (encounter number 2.6.24.) Ginelle once again chose to emphasise the issue of discipline.

This session was a disappointing one as far as I was concerned. I thought that Ginelle was using our discussion session to establish her authority. I was unhappy about the situation and the atmosphere that Ginelle created with her introductory "scolding." Ginelle pointed out to the children that they were continually interrupting her while she was trying to write an exercise on the board. She wanted to know why they did this as there were "rules" in the class that applied to a situation like this.

I tried to withdraw from the situation, although I made various contributions that sounded as if I supported the things she said.

I said:

"Can you see what is happening there at the moment?" (ii, 2812)

and

"I think... Mrs Besaans doesn't actually want you there, is that right, Mrs Besaans?" (ii, 2843)

I was most unhappy with the situation and atmosphere that developed and I contributed only because I felt Ginelle expected me to. I withdrew to a large extent during the ensuing discussion that centred around "staying in" during breaks and the use of corporal punishment or "whack-whack" sessions as they were referred to. My only real contribution was to ask for solutions to the walking around and other behaviour that seemed to stop the children from finishing the work in the required time.

After transcribing the introduction to the second lesson which Ginelle had taught (encounter number 2.6.11.), I became aware of the very vague language Ginelle used when she issued instructions during the introduction. This made me want to raise it as an important issue during the sessions.

During the third playback and discussion session (encounter number 2.6.18.) I broached this issue with the class. I explained to the entire class what we would be doing and described the questions we would be addressing during our group discussion. I showed the class the recording of the introduction to Ginelle's lesson (encounter number 2.6.11.).

The group Ginelle and I were to talk with settled themselves on the carpet and the discussion began. I asked them:

"When Mrs Besaans said, "Go ahead and do it," did you know exactly what she wanted you to do? Didn't you know quite how to go about the test? Why didn't you know what you were supposed to be doing?" (ii, 1821)

To this Lisa said:

"Because you (meaning the children) weren't listening." (ii, 1832)

I responded, saying:

"Was there anybody who had listened and still didn't know?"

I knew this was indeed the case because it had become evident from the lesson. (encounter number 2.6.11:i, from 1750) Florence said something and because she spoke so softly I repeated her answer:

"You say, you didn't understand what she said to you." (ii, 1840)

Ginelle seemed to affirm and agree with what Florence had just said but the discussion took a different turn when Ginelle reflected the comment back to the children as she said:

"Well, when I say to you, "Do you understand and Candice says "Yes", why don't you say "No, I don't understand?" (ii, 1844)

From the videorecording it looked as if Florence was about to answer the question but Ginelle did not give her chance to do so and continued with her next question. In her response to Florence's criticisms she involved two other girls by name:

Candice (see previous question) and Mandy. She said:

"Do you think, Mandy, if you don't understand, I'm saying that you're the only one in the whole class who doesn't understand?" (ii, 1850)

It is difficult to decide why she did this as it seemed to create a tense atmosphere amongst the children. It made me uncomfortable. I sensed that Ginelle was feeling threatened by the comments made by the children.

The awkward atmosphere that prevailed was not conducive to the discussion and I interceded. My sympathies were with them. However, Ginelle's voice intonation made me aware that she was not feeling very happy with the situation and I tried to relax the situation by saying:

"I don't think you're being fair to Mrs Besaans if you say, "Yes, I do understand." and you don't." (ii, 1871)

and

"... Mrs Besaans agreed that it (the introduction) wasn't very clear..... the words that she used. You must listen carefully to her (language). She's not going to mind if you say, "I really don't understand the words that you used now." (ii, 1929)

During the next discussion session (encounter number 2.6.19.) I tried to encourage the children to listen critically to the language their teacher used during the introduction of the particular lesson that was being discussed. (encounter number 2.6.11.)

I said:

"At this stage I found myself not understanding what Mrs Besaans had explained to you but she said that you had done something similar on Friday and she was aware that you would know what to do but... What was it that made you go and ask Mrs Besaans afterwards again: "What must I do?" (ii, 2460.)

The discussion that arose from this question seemed very general and focused on the children's responsibility and reactions rather than on Ginelle's use of language.

There were some children who wanted to continue the discussion concerning understanding Ginelle's instructions.

Bianca W. : "Sometimes when Mrs Besaans says like: "Do you understand?" They all say they understand but when they have to do it they don't understand." (ii, 2504.)

Claire took it a little further and said that children could feel embarrassed to admit that they did not understand. Again my comments and questions did not allow the children and their teacher to discuss this issue. Instead my questions seemed to limit the discussion to the idea that the children should listen attentively to their teacher.

We did not mention the fact that maybe Ginelle would have to improve her use of language when giving instructions so that, if the children decided to listen, they would be able to understand what was being said.

During this discussion session it seemed that Ginelle started feeling safer as the discussion moved further away from her language usage and closer to the behaviour of certain pupils. We were discussing why it was that Paul (a particularly able and, probably, gifted child) understood the instructions and was able to finish his work so quickly. As the discussion developed so Ginelle's contributions increased, however they seemed to focus once more on discipline: e.g. she said:

"And do you have a bit of a chat before you start working?" (ii, 2652.)

Her comments did not encourage the children to discuss openly and honestly the way she issued instructions to them.

This issue (Ginelle's language usage) was not to be raised again.

3.4.2 Issues raised by Ginelle as teacher - participator.

Ginelle's initial contributions remained very limited. Most of her responses were to reprimand the children. This emphasis on discipline by Ginelle was to grow as the project developed.

During the first playback and discussion session (encounter number 2.6.6.) she had the following to say when I asked Susan to fast forward the recording:

"Some of you are very spoilt. You're going: "Aw!, No!"... that's not what we like." (1a, 313)

She kept the attention focused on the behaviour of the children by saying:

"What's the one jumping out of the desk here, Collette, Andrew." (1a, 368)

and

"Note Florence is fiddling with something and Rene is fiddling with something. That is a lesson (referring to her teaching) ... Just watch who is fiddling and who is not concentrating. You should know who is not listening and see..." (1a, 379)

As Ginelle had not been consulted about issues to be raised during the first four playback and discussion sessions (encounter numbers 2.6.6 : 2.6.7 ; 2.6.18 and 2.6.19.) her contributions were unplanned and spontaneous.

During the fourth playback and discussion session (encounter number 2.6.19.) she seemed more willing to take the lead. The headmaster was present at this discussion session. I could not tell if this was an influencing factor, although I thought it to be so.

Ginelle started the session in no uncertain manner. Her main concern, still, seemed to be discipline. She started the session by asking the children (in an angry tone) to suggest ways of improving their behaviour. She referred to an agreement that they had reached concerning her introduction and the giving of instructions at the beginning of a lesson. At the previous playback and discussion session, Ginelle and the children had agreed on a set way of going about beginning of lessons. She seemed to think that they had not complied with the conditions agreed upon. She said:

"You say to me I must write the date and the heading, the numbers and get ready then you will listen and in the time you finished the work you start talking again. And, as Gina said last time, you start talking before you've even finished. So how are we going to find the solution?" (ii, 2317.)

The children then make various suggestions as to what could be done to curb their unacceptable behaviour. I summarised these suggestions.

While we were discussing why Paul was able to get his work done so quickly, her contributions all centred around the issue of discipline. She reprimanded some of the children who were spontaneously contributing answers to a question directed at Paul. She said:

"Let him say; he's asked the question." (ii, 2643)

Paul answered the question by saying that he listened carefully and then went ahead and did what was required of him.

Ginelle and I viewed her third lesson (encounter number 2.6.22.) at her flat (encounter number 2.6.23.) and we came to an agreement as to what issues would be discussed at the following playback and discussion session. (encounter number 2.6.24.) I left her to decide on the extract to be shown to the children. She chose to show them the part of the lesson that depicted the children interrupting her on numerous occasions.

I did not realise to what extent she would emphasise discipline. She started the session in a very authoritarian way, sounding indignant and angry. She started talking to the children and said:

"Right, what I want you to look at when you watch this video, Wendy, is this the last one? Right, what I want you to watch, is after Can I have your attention, please? I want you to watch very carefully how many times when I have done an exercise and I have said, "Right, write the date, write the exercise", which is what you wanted me to do, right? "Wait there, when I've done the work on the board you may start". Isn't that what I've been doing, Mathew?" (ii, 2738)

To this the class chorused a subdued, "Yes". Ginelle went on to say:

"Just watch, that's what you asked me for at the video. Just watch how many times I am disturbed while I'm writing the exercise on the board and just watch if one of those people are you. O.K. because you come up to me and ask me, "Can I sit next to somebody, can I go and do this, can I go and do it?" There are rules, What is the rule when you want to go to the toilet, Mathew?"

Mathew: "Put up both your hands."

Ginelle: "Why? why?"

Mathew: "Because.... then we disturb you."

Ginelle: "Do I have to talk to you or can I just nod my head when I see your hands are up?"

Children: "Just nod your head."

Ginelle: (sounding very angry by this stage) "I can just nod my head, do I have to be disturbed there. Yes or no? (very angrily) I am talking yes or no?" (ii, 2748)

At this outburst of very angry words the children chorused a very subdued "No". Ginelle had not finished: she continued:

"I mean, why haven't you learnt that.... (pause) What is the rule when I write on the board? Are you allowed to come and disturb me all the time? Until somebody screams, "What's number six?", like B.J. does."

Children: "No"

Ginelle: "Now watch how many times you walk around after I've given instructions." (refer to last counter number.)

They viewed the recording. I was very unhappy about the atmosphere that had developed in the class by then and I became very quiet and withdrawn. My contributions to this session were minimal and were as unenthusiastic as they sounded.

The rest of the "discussion" centred around disciplinary measures used by Ginelle in the class i.e. keeping children in during breaks and the use of corporal punishment. It was not a discussion in the true sense of the word, but merely a comunique by Ginelle to the children so that they knew what to expect if they did not do as she wished.

3.4.3 Issues initiated by the children as pupil - participants

Rian was the first child to raise an issue with his teacher. He addressed his question directly to her and asked:

"How come you always say the answer when nobody replies it.... like says... then you say, "Oh, fifty-two well done," and nobody ever says.... and nobody.... but you can't hear." (1a, 395.)

His question was ill-phrased but on tape he did not sound ill at ease. He was referring to Ginelle's practice of asking many questions, only some of which the children could answer. If they did not know the answer she supplied the answer or if they knew the answer she repeated it and praised the child concerned. (lesson one: encounter number 2.6.4.)

Listening to the tape (1a, from 407.) it seemed as if the children were willing to start a serious discussion; weighing up the pros and cons about teachers repeating answers that children had already supplied. I lacked the skill to encourage the discussion to develop and it ended abruptly when one child said that she thought two days meant twenty-four hours. Discussion never returned to this issue.

A very serious issue raised by the children was the one of boredom. I asked them why they "fiddled" to the extent that it irritated Ginelle during the lesson. (encounter number 2.6.4.)

I thought that the children phrased their criticism very sensitively. Collette, for example changed her original use of our teacher to the teacher. It was as if she wanted to protect Ginelle by changing her original wording. The fact that Collette chose to rephrase her question accords with Hull's (1985c) findings that children would generally phrase their critique very "delicately".

I invited them to think of possible solutions to this problem. They offered various suggestions but they were not encouraged by their teacher. For most of the time Ginelle stood very quietly hardly looking at the children while they made their contributions.

As it turned out, nothing came of their suggestions except one which Ginelle tried for two days and then stopped without any further consultation with the children.

This issue was to be raised in the very next playback and discussion session. (encounter number 2.6.18.) Once the class had been divided into the two groups as described in 2.6.16 Ginelle and I started the discussion with the so-called "quieter group". Natalie, one of the girls, raised this very important issue again when she said:

"We were talking. We were bored." (ii, 1592)

Both Ginelle and I seemed to shy away from the topic. I asked for "other things" that they had noticed while viewing the section of videotape and Ginelle maintained silence.

No authentic dialogue was established so that this very crucial issue, to the education of these children, could be opened for closer scrutiny by the children and Ginelle. The children never had another opportunity of raising this issue with their teacher.

CHAPTER FOUR

NEGOTIATION

4.1 INTRODUCTION

Action research is dependent on the participation of all the people involved. It is necessary for all the participants to share in all the moments that take place within the action research cycle. This involves a collaborative-type involvement for those concerned. (Grundy and Kemmis in Flanagan, et al., 1984.) This collaborative nature of action research requires that all those involved are entitled to an agenda. The agendas will differ because of differing interests. Agreements have to be reached to adjust those agendas so that all the participants involved feel that their needs or interests are being met.

These agreements can only be met by processes of negotiation. This process of negotiation is vital to action research as this is the way that the democratic nature of action research is preserved. Grundy and Kemmis (in Flanagan, et al., 1984:10.) say that action research "requires a special kind of communication which recognises the authentic knowledge of group members, recognises points of view and engages them in practical and political deliberation about practice." By the process of negotiation the participants must be able to set up a shared agenda that could possibly be authentic and meaningful to all the participants.

Participants should be equals and be able to listen to arguments and make adjustments to their opinions so that the ideas of others can be accommodated. This can only come by the way of negotiation.

Brock-Utne (in Elliott, et al., 1980.) stresses that discourse between participants is necessary i.e. presenting arguments and following them through with reasoning. One vital aspect of discourse is that the parties must look upon one another as equals. It is important that they hear one another's arguments and that they may be willing to change their point of view in light of these arguments.

Negotiation is a term that is frequently misused within our racist South-African society. It basically means that agreement is reached by discussion. The negotiation within the context of action research would have to be soundly based on a discussion that is closely related to the term "dialogue" used in the Freirian sense.

4.2 NEGOTIATING WITH THE HEADMASTER

The first person to be involved in negotiation was the headmaster. I made an appointment to see the deputy-headmaster as the headmaster was on leave. We discussed the project. He indicated that he would allow me to work in the school providing he had the right to view the video-taped material to ensure that the good name of the school would not be harmed in any way. I readily agreed and assured him that he would be able to view and edit the recordings. Other than this I was not bound by any other rules or requests.

I had explained exactly what I intended doing in the school and the deputy-headmaster had ample opportunity of raising any issues that could have worried him.

When the headmaster returned to the school I felt obliged to see him (see encounter 2.6.13.) to ensure that I was still welcome in the school. I repeated most of what I had explained to the deputy-headmaster and he seemed satisfied with the terms we had agreed upon.

Ginelle had her own negotiating to carry out with the deputy-headmaster. She approached him just after I had approached her about the project. (encounter number 2.6.1.) She said:

"I told the headmaster how I got involved with you in the teaching profession... so I think he's seen the positive side. I said, "Well, one of the teachers is doing a thesis and wants to improve." So he sees the good side of what we're doing." (3a, 592.)

Judging from what she said to the deputy-headmaster, she needed to know that he approved of the project.

The deputy-headmaster was neither very encouraging nor discouraging. His main concern was that nothing should taint the very prestigious name that the school already enjoys. Johnson (1975) cites this as a common reaction when negotiating with head teachers. He sees himself in a "gate-keeper" role.

Johnson (1975) says that if the head teacher has a certain pride in a particular aspect of his school he may be more willing for that aspect to be researched. This could explain the deputy-headmaster's reluctance to show any positive support for the project as he did not know Ginelle all that well and he was not sure of her teaching abilities and/or what kind of teacher she was.

4.3 NEGOTIATING WITH GINELLE

Ginelle, the teacher, and I, the outsider, had to come to agreement on certain issues about the project. She was the one who was accountable to the headmaster and she was the one who carried the responsibility for the smooth running of her classroom. I, the outsider, realised that she would have the main say in when we would be able to go to the classroom and when not.

4.3.1 Negotiating the details of the project

From the outset I realised that the days we would be at the school and the periods that we would use would have to be negotiated to suit Ginelle's timetable and to suit myself as I had certain teaching obligations.

Negotiating what time we could use in Ginelle's class was very important. At first, I merely asked Ginelle when we could come to the class. I went to the school on the days she suggested would suit her best. This, was how most of the days were arranged.

Once I had arranged what days to be there, I had to arrange the period/s that would be convenient to use. Ginelle was responsible within the school system so I felt she was to have the say concerning the use of her time. Mostly, we came to easy agreement as she decided at the outset of the project that the two periods of mathematics on a Monday would be the most suitable time to have us there. This was a satisfactory arrangement as it suited us both.

As an outsider, I had to adjust to whatever arrangements suited her best. I wanted to go to the class just as a visitor for a few days. The negotiation that took place (Monday, 13 October, 1986: encounter number: 2.6.12.) as far as the issue of days and times was concerned, can be cited as a typical example of negotiation of this matter.

Me : Would you mind if I just popped in here.... a couple of times, maybe on Thursday or Friday.... to get a feel of the class?

Ginelle : Ja, Friday first lesson we've got a test. (4a, 000)

From this statement of hers I inferred that she would prefer me not being there on Friday during the first lesson, so I said:

"O.K. I won't come those first lessons." (4a, 010)

Ginelle agreed. I accepted her decisions concerning this issue, without any argument.

As the project continued, Ginelle and I became more honest with each other and the process of negotiation became more authentic. I felt more at ease and would try to get Ginelle to agree with what I had suggested. I was willing to concede, when I realised what I had suggested did not suit her, as can be seen by the following example concerning the use of two periods, one Monday morning, towards the end of the project.

Our usual arrangement of using two full periods did not suit her as the class was going on an excursion the next day. She wanted them to do a lot of writing work on that Monday so that they would not fall behind in their work.

I was oblivious to her plans. She asked what I would be doing on that Monday. (encounter number 2.6.17.) I gathered that she was asking how much time I needed with the children. I wanted to use two full periods and explained this to her. I said:

"So it's basically going to take two full periods"

to which she quickly replied:

"Um... not today.... or do you want it to-day?" (5a, 46)

From her tone of voice I deduced that she was not willing to give up the two periods, but by now our relationship had developed to the point where I felt at ease to try and push for the two full periods. I said:

"If you can, today, but if you can't then just....."

I added the last phrase so she could feel free to refuse, which she did in no uncertain terms.

Ginelle : "No, I'll tell you why....." (5a, 48)

This shows how the process of negotiation was becoming more authentic, as the project continued, and we were able to be more honest with one another. I felt I could try putting my own interests to her, allowing her space, though, for her own interests.

4.3.2 Negotiating the agenda

At the very beginning of our project when I first approached Ginelle (encounter number 2.6.1.) we did not negotiate the meaning of "improving teaching practice". This was unfortunate as was to become evident during the project.

One of the most important issues of the project was choosing the excerpts from the videotaped lessons which would be discussed by the children, Ginelle and myself. This was one issue that should have been very carefully negotiated because of the sensitivity of the issue. However for the first four playback and discussion sessions (encounter numbers: 2.6.6; 2.6.7. and 2.6.18 and 2.6.19.) of the project I chose the excerpts that would be used and what questions would be posed concerning those excerpts. During the second discussion session on 15 September (encounter number 2.6.7.) I said:

"..... today I'm going to play only certain parts of the lesson we had last week and I'm going to ask you questions..." (ii, 0000-0008)

At this, the beginning stage, of the project there was no negotiation of this issue.

I tried negotiating this issue with her during the discussion at her flat on 6 October (encounter number 2.6.10.) I said to her:

"Where would you like to take it from here now, if you had a choice? Is there anything you would like to be done from now on?" (3b, 573)

Instead of leaving the question so it would remain an open one and she would feel at ease to suggest anything concerning the entire project I continued:

"... maybe I could come back with this playback session and discussion....., or would you like us to do another lesson." (3b, 575)

By closing the question I limit her thoughts and choices and thus, the negotiation.

During the third playback and discussion session (encounter number 2.6.18.) I invited her to join the group and asked her to ask questions she thought were important. I was deciding on what would be shown and what questions would be asked concerning that lesson. (encounter number 2.6.11.)

As the project progressed I became aware that this lack of negotiation might be creating problems. I had become aware what the children said was often taken very personally by Ginelle. While we were discussing her reactions to what had been said by some of the children, she said that their criticisms and some comments had hurt her feelings. (encounter number 2.6.10.) My comments and questions were often seen by her as indirect criticisms, too.

It was this awareness that led to the negotiation of the choice of excerpts during final discussion I had with Ginelle. (encounter number 2.6.23.) I realised that if she had a say in what was being shown and spoken about, she would feel more in control of the playback and discussion sessions and might feel a little more secure with questions, criticisms and comments from the children.

We decided to view the video-recording of the last lesson (encounter number: 2.6.22.) at her flat. Between the two of us we decided on what was going to be discussed.

I drew her attention to issues that I thought would be worthwhile discussing by saying things like:

"..... what was interesting was that I caught those children who ran up to you after you'd explained... you've always got such a crowd around you." (6a, 040.)

Seeing the children continually interrupting her during her teaching she said:

"It's incredible, maybe you should comment on that also." (6a, 656.)

She still did not perceive herself as being in control as she said:

"... maybe you should comment" (6a, 657)

but this was to change within the next few minutes because just after this, we (her husband and I) questioned her practice of getting those individuals in the class who had obtained full marks for a test, to stand up to be applauded and she then said:

"Maybe I should ask them. ...I'd love to hear." (6b, 461)

I felt elated to hear her say this because it was something that I would have liked to ask the children. Most important, of all was, she raised the issue as one that she would like to talk about to the class.

By the end of the evening we had agreed to discuss two issues; issues we both thought very important ones. This was still not negotiation in the true sense of the word because Ginelle and I were not sharing the ownership of the project. I had the impression that Ginelle still viewed me as "in charge" because during the last discussion and playback session (encounter number 2.6.24. she asked:

"Wendy, is this the last one?" (ii, 2738)

although, we had previously agreed that October 30 was to mark the end of the project. We were nearer to negotiation than we had ever been before. Allowing her to view the taped lesson and then decide what issues she wanted to raise with the class, the project was now better able to serve her interests, as well as my own.

At the beginning stages of the project I insisted that the children be involved in the discussion sessions and told Ginelle so during our initial meeting. (encounter number 2.6.1.) I asked for her permission to do this again, in front of the children. I said:

"I don't think she will mind if you ... ask questions about why she does certain things.... and say what you do not like about the way she does certain things." (1a, 334)

Ginelle said that she would not mind as she had invited them to criticise her teaching before. Rian, a very astute and sensitive boy, said:

"Yeah, but you got cross with Tudor and Paul and Colin." (1a, 357.)

Ginelle assured us that she did not mind and thus the entire class was invited to comment on Ginelle's teaching.

4.4 NEGOTIATIONS THAT TOOK PLACE BETWEEN GINELLE AND THE CHILDREN.

Negotiation between Ginelle and the children usually took place during the playback and discussion sessions. A discussion would usually arise, focusing on a problem area in a lesson. The children made suggestions as to what could be done about the problems that had been identified and Ginelle accepted or rejected the solutions offered by the children.

These solutions that were accepted were negotiated to some extent as the project continued.

During the first playback and discussion session (encounter number 2.6.5.) which was arranged to view and discuss the first lesson we had videotaped (encounter number 2.6.4.) there was very little negotiation as our questions did not lead the children to make any suggestions, instead we seemed, to ask only for comment.

However, towards the end of this session a little negotiating took place between Ginelle and Alistair, one of the boys in the class.

We had been discussing the fact that Ginelle always praised those who received very high marks for a test. I asked those who seldom heard praise if they would like to be told that they were good at something. Alistair said:

"Ja."

Ginelle then asked:

"Alistair, would you?"

Alistair:

"Ja."

Ginelle then said:

"O.K. I'll have to fix that." (1a, 437)

This limited negotiation did not last long. During the very next discussion session (encounter number 2.6.7.) centering around the same lesson a very different picture emerged.

We discussed the fact that the children were bored in the classroom as there were long periods of uninvolvedness. I invited them to offer suggestions as to what could be done about the problem. The children offered various suggestions they thought would improve the situation, none of which seemed to meet with Ginelle's approval as she kept quiet most of the time. This changed when Natalie made the following suggestion:

"Miss De Villiers writes down all the things we have to do that day and all we have to do is talk to Miss De Villiers.... 'cos then we know what we must do and we can finish our work first."

Ginelle reacted to this suggestion by saying:

"Can I ask someone how they feel? Matthew, if I write on the board, a maths exercise, an English grammar exercise, you've never seen before, new work, a comprehension and a history note to write down, if you came in, in the morning you didn't feel like history and you saw that, how would you feel?"

Matthew answered:

"Great."

Ginelle did not sound too sure of this statement when she asked:

"Would you say, "Wow, it'll be a good day ?"

and Matthew said:

"Yes."

Ginelle acceded and said:

"O.K." (Ia, 437.)

They decided to try this idea for the following two days. After this trial period Ginelle stopped doing this as she felt that the slower ones were not coping. She stopped of her own accord without any further negotiation with the children.

During the next playback and discussion session (encounter number 2.6.18.) the children were asked to comment on the general restlessness and the noise they generated. They offered various suggestions as to how the problem could be solved. Ginelle seemed to sum up most of the suggestions when she said:

"Maybe I should say: "Write the date and write the exercise and then I should wait."

She foresaw a problem and continued:

"... when I wait then some start talking 'cos some finish before others."

Colin, saw a further problem:

"Some don't do it."

(i.e. write the date when told to do so.)

Lisa pointed out:

"You can do the date quickly and don't talk." (ii, 1762.)

This exchange took place but nowhere had anyone actually said that they should try it for a period of time. They attempted doing this for the next few days so everyone must have assumed that agreement had been reached, although it was never formally stated that an agreement had been reached through their discussion.

This was not the last of this issue. At the following playback and discussion session (encounter number 2.6.19) this question of being disruptive, noisy and restless during the introduction of a lesson was once more the topic of discussion. It was evident that the suggestion for improvement made by the children did not have the desired effect which were not really acknowledged by Ginelle, until Gina suggested the following:

"We could like write down our numbers and draw our margins at our desk and then we come and sit on the mat and then Mrs Besaans explains the work to us." (ii, 2388.)

Ginelle responded:

"That's an idea."

in a tone of voice that reflected her approval.

Other suggestions were made but they seemed to become lost amongst other comments and because Ginelle said:

"We'll try them out. The suggestion of coming to the carpet, if you're going to learn anyway, is a very good one. What do you think?"
(ii, 2430.)

She highlighted the one that she seemed to think would work best before discussing it further. Predictably, the children, eager to please their teacher, chorused an enthusiastic "yes."

The videorecording of the lesson that followed (encounter number 2.6.22.) showed that they went to the carpet, as was suggested by Gina, but they had not been given the chance to write the date, etc. before doing so. The negotiated solution was not carried out as originally discussed and agreed upon.

The following playback session (encounter number 2.6.24.) started on a very awkward note, as Ginelle was obviously dissatisfied and angry. She, indignantly, accused them of not honouring the agreement. She said:

"You've sat on the carpet and I've said right, write the date, write the exercise, which is what you wanted me to do, right, wait there, when I've done the work on the board you may start". (ii, 2747)

Ginelle continued:

"Isn't that what I've been doing, Matthew?"

To which a number of children chorused "yes". No-one objected to the fact that this was not the original agreement. Ginelle then continued in a voice laden with anger and accusation:

"Just watch, that's what you asked for at the last video. Just watch how many times I am disturbed." (ii, 2752)

Her implication was, although she kept her side of the bargain, they had not.

It appeared that up to this point it was not true negotiation. Ginelle listened to what the children suggested and took the one that suited her needs best. The children were not participating as equals in the process.

4.5 NEGOTIATIONS BETWEEN MYSELF AND THE CHILDREN.

On Monday 1 September, 1986, I met the children for the first time. After introducing myself I explained about the project, in very broad outlines to them. I asked them if they would help with the study. They were very excited at the idea of us going to the class with all the equipment. They eagerly agreed that it would be very nice to be involved. No discussion emerged from this exchange.

I was aware of the importance of negotiation, within the context of action research. It worried me that I had not involved the children in negotiation where issues could be discussed and decided about together. I made an attempt but lacked the skill to allow discussion to develop. We were discussing ways which they could help one another remember suggestions that had been made. I wanted to hear what their feelings were about this and I asked:

"Do you think it's fair to do that?" (ii, 1186.)

(To which only one boy replied:)

"yes."

I realised that the others might not agree with him and I asked the class:

"Are you sure?"

The same boy again replied:

"yeah".

I was not satisfied that this indeed reflected their feelings about the matter. It might well be that they took his agreement to be representative of their answer. I then turned to Ginelle and asked her what she thought. I asked:

"Mrs Besaans, what do you think about the instructions I've just given?"

Ginelle replied:

"I think it's fair." (ii, 1191.)

This seemed to set the pattern for the entire project. I seemed unable to negotiate with the children.

4.6 **REFLECTIONS AROUND THE THEME OF NEGOTIATION.**

Reflecting on how the negotiation had or had not taken place during the project, led me to realise that negotiation is a vital process to the entire action research process. Negotiation has to be approached carefully and sensitively. It is important that all those involved should be able to make well-informed choices and it is important for participants to identify crucial issues concerning the project and negotiate them thoroughly.

4.6.1 **Recording of Negotiations.**

I feel that it is very necessary to either audiotape or videotape all negotiations that take place. In the initial stages of the project I did not do this and as a result had no way of recalling exactly what had been said. These beginning negotiations concerning Ginelle's involvement in the project were lacking in many ways and a recording of what had been said at our first meeting would have proved invaluable for analysis purposes. Recordings, video or audio, help recreate more vividly the exact situation than mere description. (Walker, *et al.*, 1979) Walker, *et al.*, (1979) stress the advantage of delaying one's interpretation and selection of information. When it comes to the analysis one has a fuller and more detailed recording if one has used videorecordings or audiorecordings to refer to.

Diary entries and/or field notes force one to select, organise and process a number of complex situations within a very short time.

During the course of each of the sessions of the project it is necessary to plan thoroughly for this process of negotiation. A special time should be set aside to carry out the negotiations that would be necessary for the continuation of the next phase or session. Planning would facilitate the recording of the negotiations.

Recording all negotiations would make the writing up stage of a project like this much easier. It is difficult to carry the tape recorder in one hand, the bags and equipment in the other and press all the correct buttons for recording while negotiating times and days at the door of a noisy classroom as one is leaving - so, it is essential to plan all negotiations thoroughly.

Recording the negotiations that have taken place is necessary so that the people involved can return to the recording and determine whether or not negotiated issues were carried out.

This became evident after I had viewed the videorecordings of the discussion sessions where negotiations had taken place between Ginelle and the class. Listening to the criticisms that Ginelle levelled against the children, I realised that some of the changed actions the children suggested had not been carried out exactly as they had been suggested. Ginelle would change the sequence of the suggested change. I, as facilitator could have eased some of the tensions that arose when Ginelle criticised the children for not keeping their side of the bargain. Gina, one of the girls in the class, suggested that to solve the problem of children being noisy and disruptive before they started working, Ginelle should let them:

1. write down the numbers and draw the margins in their books and
2. let them then sit on the carpet and teach them there.

Ginelle agreed and said:

"The suggestion of coming to the carpet... is a very good one."
(ii, 2430)

When she criticised the children in the following discussion session she said:

"... that's what you asked for at the last video." (ii, 2752)

But if one views the actual lesson (encounter number 2.6.11.) it is evident that the sequence of events suggested by Gina had not been carried out by Ginelle.

If I had stopped the discussion at this point and encouraged the questioning of the validity of her criticisms, in the light of evidence from the video-taped recording, it might have assured the children of the democratic process of action research and that they had a right to question their teacher's actions and criticisms and that they were expected to participate as equals.

4.6.2 Negotiating the presence of an outsider.

Susan, the camera-person, was another outsider and when discussing the project with Wendy Flanagan, (encounter number 2.6.9.) she questioned the wisdom of having Susan in the classroom. It had occurred to me that Susan's presence in the classroom could be unsettling for Ginelle, but I only gave the question serious thought once Wendy Flanagan had said:

"I think one must be very careful of other outsiders chipping in, for instance, having Sue around..... I, as a class teacher, would find that most unacceptable because I've already put myself into a very threatening situation." (2a, 222)

I realised that we had never discussed or negotiated Susan's presence. I tried to make amends by asking Ginelle during our discussion (encounter number 2.6.10.) if she minded Susan being there. To this Ginelle answered:

"No, no Sue... but they like her." (3a, 047)

This was a matter that should have been negotiated and discussed very carefully. I should have explained to Ginelle that besides just operating all the equipment Susan would be present at the sessions when we would be discussing questions that were being raised about her practice. Susan made various contributions. During the first playback and discussion session (encounter number 2.6.6.) Susan questioned Ginelle's use of praise. Susan asked:

"How do you like it when she says "good" after the answer. Do you think she should say nothing or just the answer - why do you think she says good?" (1a, 424)

I should have indicated to Ginelle that this situation could arise. I should have negotiated with Susan as to what her role would be in the project. I feel it would have been a good idea if the three of us had discussed the question of Susan's presence, in the classroom, together so that both Susan and Ginelle could have a clear idea of what Susan's role was to be.

4.6.3 Negotiating crucial issues.

During the project I became aware that certain crucial issues concerning the project had not been sufficiently negotiated and, in some cases, they had not been negotiated at all. This had far reaching implications for the project. Negotiating these crucial issues is vital within the framework of action research. Bell, et al., (1984) found that meticulous negotiation concerning issues like definition of role, definition of procedures and ownership of data were vital ingredients to the research situation.

Negotiating issues that are important to the concerned participants can be time-consuming and lengthy especially if those concerned are truly committed to the democratic spirit of action research. However, once agreement has been reached it serves to create "a more informed atmosphere within which to carry out one's research." (Nixon (ed), 1981:80.) An informed atmosphere would work towards establishing a trust relationship amongst the participants, thereby enhancing the collaborative nature of action research. Lengthy negotiations could be rewarding for those involved but the participants should guard against being entirely caught up in negotiations and wasting time which could be used

more constructively in the actual research situation. (Brocke-Utne, in Elliot, et al., (eds), 1980)

Negotiating the crucial issues is the very basis of the success of the project. It is only once everyone is satisfied that their own particular needs are being met that they would feel that they are free to take part in the research project as equal participants. Participants would have to experience their wants and expectations to be of equal importance. This could be achieved if the issues which are crucial to the project are carefully negotiated. Thus the democratic ideology upon which action research is based would be ensured. If, however, participants experienced their needs and expectations as less important they would not experience action research as a democratic process.

4.6.3.1 Negotiating crucial issues with the headmaster.

In the negotiations with the headmaster most of the important issues were clarified. The main ones being the use of his school for the project, editing rights of the recordings and whether or not he wished the school to remain anonymous in the write-up.

Another important issue to clarify with the headmaster would be the nature of the project. The headmaster, at this particular school, did not enquire what was meant by the term "improvement of classroom practice". He seemed satisfied with the thought that I would be videorecording some of Ginelle's mathematics lessons and ^{she} and I would be discussing them. The fact that I was to use this project for a M.Ed. dissertation legitimised the project sufficiently in the eyes of the headmaster. It would only be fair to a headteacher, who did not enquire after the exact nature of a project, to explain as fully as possible to him/her what the project would be about and its implications. She/he would then be able to make informed choices regarding the researcher's presence in her/his school and negotiations could be regarded as authentic.

4.6.3.2 Negotiating crucial issues with Ginelle

I feel that the negotiation during the initial stage of the project was not satisfactory because Ginelle was uninformed as to what action research was. She was uninformed about the democratic processes that should be an inherent part of action research. I could have helped her by making written accounts of action research done in classrooms available to her. During the last discussion session she and I had at her flat, (encounter number 2.6.26.) when I asked her if she thought articles or write-ups would have helped her to have a better understanding of the process of action research, she avoided my question.

me: Do you think that if I'd given you one or two articles that generally discuss action research and what comes from it would it have helped, maybe?"

Ginelle: "I think when I started off my aim was to see that I was improving and to help you." (6a, 225.)

She had not answered the question and it is difficult to say if extra reading material would have helped the situation. Would she have found the time to read written accounts considering the time her normal teaching load demanded?

When I first spoke to Ginelle about becoming involved in the project I should have encouraged a discussion on "improving teaching practice." Ginelle certainly would have some idea as to what she would take this to mean. If she really had no idea as to what she could be looking at then I could have provided her with possible hypotheses or questions. This would have served as an explicit guide as to what we could be researching. (Adelman, 1975) This would have to be done at the very first meeting. I realised during the very first discussion session that Ginelle was not authentically involved in the research of her own practice, I followed the recommendations of Kemmis and McTaggart (1982) and presented her with a list of open questions concerning teaching practice. But when we got round to actually discussing them at the discussion session at her flat, I lacked the necessary skill to allow her to start verbalising actual questions that she would like to research.

Hull, et al., (1985) say that it is difficult for teachers to initiate worthwhile research questions as many issues that are worthy of research have been made obscure within the classroom because of their very familiarity.

Rudduck (1985) stresses that the facilitator should sensitise the teacher to those moments in the classroom when she/he is surprised by something that has happened. These moments of surprise could very well lead to interesting research issues. Another reason why Ginelle could have found it difficult to raise an issue which she would have liked to research is that teachers have become very isolationist. Teachers, in our society and others, are not encouraged to share their concerns about classroom practice. (Nixon, (ed). 1981)

I certainly have very definite views on what improvement of practice means to me. Negotiation could have lead us to arrive at a shared meaning of "improvement of practice"; in turn, this would have given us a clearer idea of what we were working towards. Day (in Holly, et al., (eds), 1986) says that it is necessary to establish what each of the participants wishes to gain from the project at the very start. Had Ginelle and I done this at the outset of the project, Ginelle would have been in a position to assume the role of initiator of research questions. Kyle and McCutcheon (1984) emphasise this as a very real possibility in true collaborative research. They recognise the possibility of disagreement arising concerning issues to be questioned and pursued but also recommend that this be resolved by way of negotiation. Nixon, et al., (1979.) say: "The basis for successful co-operation seems to lie in mutual respect and equality amongst those involved. This resides in the willingness of each individual to recognise that the other has a different perspective on the common problem which they have come together to investigate."

Once Ginelle was aware that I wanted to involve her in the project and once she realised exactly what it would be that we would be doing I should have given her sufficient time before committing herself to being part of the project. Bell and Colbeck (1984) recommend this so that the teacher has sufficient time to consider all the implications of being involved.

If I had followed these ways of initiating the project I do not think Ginelle would have ever said the following during the discussion session at her flat on 6 October, 1986 (encounter number 2.6.10.):

"I think when I started off my aim was to see that I was improving and to help you. There's no aim of, of improving teaching as such from my end..." (3a, 228.)

I feel that this reflects how important we rated the M.Ed. dissertation. I was also feeling that she was not gaining much from the project because of sufficient negotiation. During an earlier discussion I said to her:

"I definitely think you should say, "Well I must get something out of it too." (3a, 543.)

Our negotiation at the initial stage had not been true negotiation where I could spell out what I wanted to come from this project and where, she could say, in no uncertain terms, what she would like to come from the project. This lack of negotiation was to prove to be one of the factors that would effect our later work, as can clearly be seen in the other themes.

Another very important issue I failed to negotiate with her at the outset of the project was the part the children in her class were to play when it came to discussing her classroom practice. When we first spoke about the project, we did not fully explore the implications of involving them fully in the playback and discussion sessions. The entire issue of involving the children should have been openly discussed and then agreed upon, once we had both established what our concerns were regarding this issue.

I felt that involving the children in the discussion sessions would be the only real way of implementing any worthwhile changes in the classroom. I took it for granted that Ginelle would appreciate this, too. She did not question my insistence that they be involved. I, therefore, assumed that she thought it a good idea. This assumption was strengthened when during one of our discussions she said:

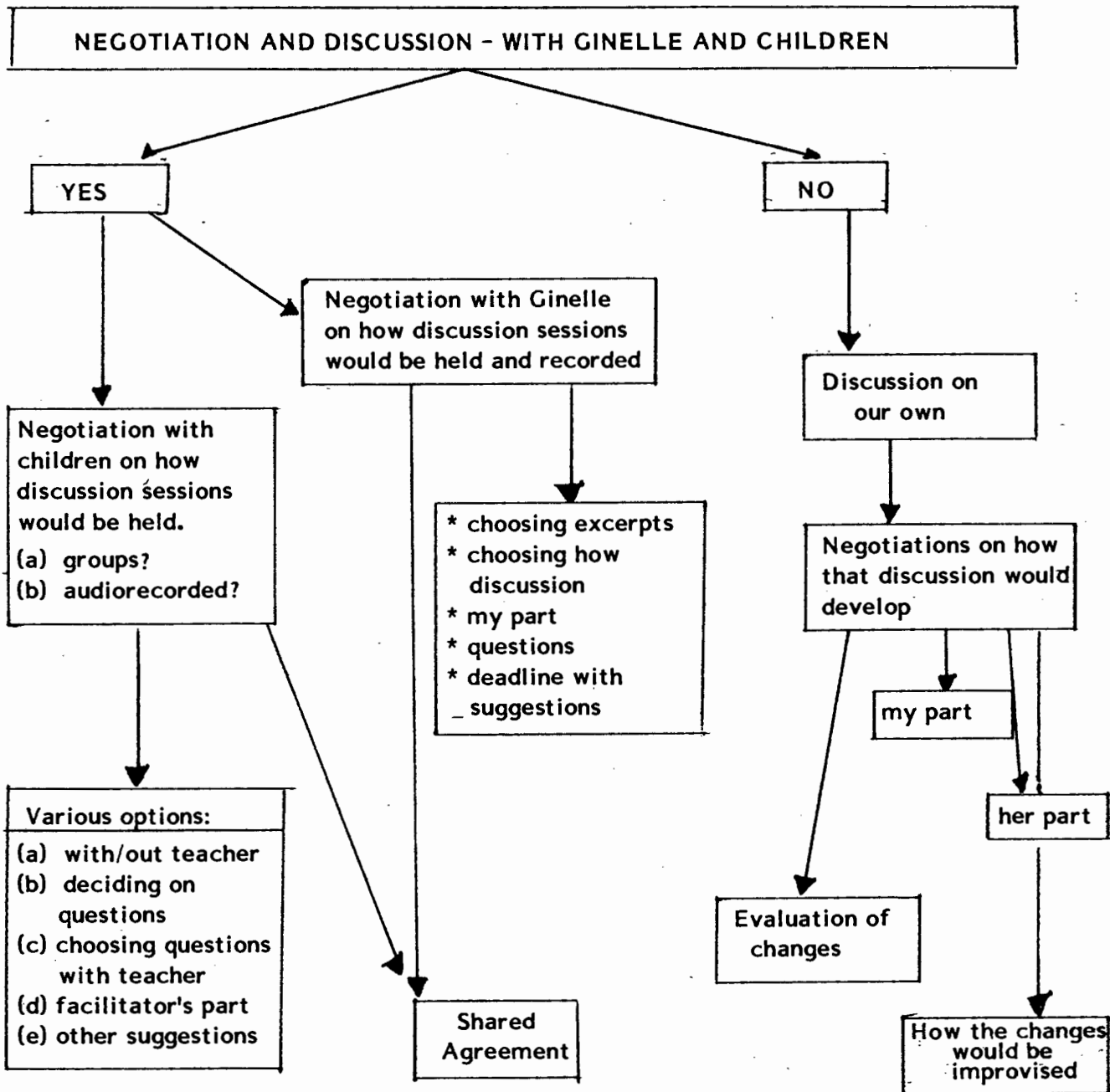
"I'm not an ordinary teacher, but I'm there to help the child as a whole personality." (3a, 382.)

and

"... my sort of democratic way of looking at the children and how they behave." (3a, 324.)

I should have discussed it with her and if she did not think it to be a good idea we could have then come to a mutually acceptable arrangement concerning the children's involvement.

The following diagram illustrates the possibilities of the negotiations that could have taken place concerning this question of pupil involvement:



Ginelle and I should have negotiated how we would select extracts from the lessons to discuss. This was a very sensitive issue. The fact that Ginelle did not define a research question lead me to believe that if I showed her what some of the options were she could then take over.

This did not work at all. While I chose the extracts of tape to be viewed she remained totally uninvolved but the children were becoming quite involved and serious about their role. I was very much in control. Ginelle, whose practice was under scrutiny, did not have any say in the matter at all. Her uninvolvedness came through very clearly when viewing the tape as she stood very quietly and did not say a word except for the odd comment here and there. eg.:

"Say your name." (ii, 0437)

She also asked various children to contribute to the discussion.
When I questioned her about this session she said:

"I was just basically sitting there as a listener... listening to the criticism that I could have actually listened to on a tape." (3a, 60)

She perceived herself as playing no active part in the session because I had not involved her in the choice of what we were going to discuss and how the discussion would take place. I had gone into the situation with a set agenda, although I was aware that this is what I should be avoiding at all costs.

However, as she took over the choice of extracts it became evident that she was using the discussion sessions to establish her authority and discipline to a greater degree in the class and the children were not contributing in any authentic way. They were being led to criticise themselves and their behaviour. This is evident during the last discussion session. (encounter number 2.6.24.)

The tone of the entire discussion session was set at the very beginning when Ginelle said:

"Hey, you're not babies, sit down. Alison, Rian, you're going to be last again and you're going to get a (inaudible)" (ii, 2716.)

Her voice tone did not make for a very happy atmosphere in the classroom. The children came to sit on the carpet but were talking while doing so and Ginelle said:

"And when Wendy asks you then you've got other stories and nobody talks."

She continued setting this atmosphere of authority when she raised her first point of discussion. She said:

"What I want you to watch... Can I have your attention please"
(ii, 2742)

She sounded quite angry. The children appeared to be withdrawn and uninvolved. This illustrates how important it is that we should have found a way of directing the discussion sessions so that both these extremes could have been avoided. An agreed course of discussion can only be arrived at by authentic negotiation.

The choice of extracts should rest with the teacher concerned. (Hull, 1985b) It is interesting to note that Hull (1985b:25) says "We then review the tapes and decide which sections are most likely to generate fruitful discussion." It would appear that the involved outsider has a part to play when choosing extracts to be shown for the purpose of discussion.

Where the pupils are involved their rights and expectations should also be taken into consideration. Hull says that as pupils grow used to the research ideas and principles so they will become more vocal concerning control of the project. If this should happen then one could expect authentic negotiation to arise amongst all those participating in the project. Only then would one be sure that everyone concerned is experiencing action research as a democratic process.

4.6.3.3 Clarifying crucial issues with the children

My negotiations with the children disappointed me. I seemed to lack the skill to allow questioning to develop in any meaningful way. They seemed to accept an unspoken assumption that they did not have a say in what we were doing.

This situation of being in control is so unusual, to the children in white primary schools, that I should have realised that they would need to experience being in control before we could expect any meaningful negotiation to take place.

These children needed to see that they were meant to be equals in the project along with Ginelle and I. If, given the Christian National Education constraints, these children could not participate as equals then Ginelle and I should have made them feel that what they said was valuable to us and that what they said would be taken very seriously by us.

Everytime I enquired about their thoughts on the project I would be met with broad smiles and would be told that it was "a great idea". I felt powerless to bring about critical thought concerning the project.

At the very beginning when I asked them if they would mind the vcr they would reply with the usual vigorous chorus of: "no". They never raised any questions as to who would be seeing the recordings and what would become of them. This accords with the findings of Sadler (in Elliot, *et al.*, (eds) 1980) who says that not once would it occur to the children to enquire about her right to audiotape their conversations.

X It seems necessary, therefore, to educate the children towards an awareness of their rights at the very beginning of a project of this nature so that they can participate authentically in the negotiations concerning their lived reality.

The facilitator and teacher-participator must have a moral commitment not to abuse or exploit the children-participants.

Y One aspect that should have been thoroughly negotiated with the children is the question of Ginelle's presence while they were commenting on the lesson. Ginelle's access to their comments and recommendations for improved practice could be negotiated with them beforehand. This course of action is recommended by Adelman (1975) This might have prevented the unhappy extremes we experienced during the discussion sessions as set out above.

Another issue requiring negotiation would be one concerning how all the participants would evaluate whether the suggested changes for improvement were being carried out as they had been accepted. This would offer the participants a measure of protection if a situation arose similar to the one at the beginning of the last playback and discussion session. (encounter number 2.6.24.)

CHAPTER FIVE

REFLECTIONS ON OUR PROJECT

5.1 ON BEING A FACILITATOR..... AWARENESSES

Being the facilitator of our project brought about a number of awarenesses and learning experiences. The most important of these could best be explored by, once again, using a thematic approach.

5.1.1 The role of the facilitator

At the beginning of our project I was convinced that as facilitator I wanted to be a resource person for the teacher. I did not want to provide any input. I would be the disinterested party. This aim did not materialise and I have come to realise that this might not be the best role for the facilitator. At all costs I wanted to avoid having an arrogant or patronising manner and seen to be only sympathetic to the children involved in the project. (McNamara, 1980)

I became very involved with the participants. I found myself taking sides from time to time. My experience taught me that this might be very important to maintain an equilibrium between the very assertive role that the teacher might adopt and the submissive role that the children could take. Making people aware of their manipulation of others would be very important. This forces the facilitator to "take sides".

I found that being deeply involved in the project made my commitment to the project that much stronger. I do not think this commitment would have been achieved had I remained aloof and uninvolved. My greatest problem was to distinguish between the two concepts of commitment and ownership. These two concepts are very different and should not be confused.

I feel that a facilitator has to be totally committed to the project if valuable classroom research is to be achieved. The degree of commitment should not stand in the way of sharing ownership of the project, however.

The facilitator must allow the teacher and pupils to share their expectations and/or agendas and come to an agreement on what they will be trying to achieve within the project. This calls for negotiation skills. The facilitator must be able to create the space for all the participants to agree on an agenda. This would facilitate the research and improvement of classroom practice, as it would help the participants avoid vague issues.

In South African, state-run schools, this might not be as easy as it sounds because the children-participants are not used to being consulted about their wants and expectations of their teacher's practice. The facilitator would have to be very careful and sensitive when negotiating during an action research project.

Nixon, et al., (1979:123.) describe the role of the facilitator: "If a teacher says to an observer, 'I think my problem with this class has something to do with the way I start the lesson. Can you observe the beginning in some detail?', then the observer is in a position to give some real help to the teacher. In this manner

the teacher is defining his own problem, as he sees it, for the observer, so that together teacher and observer may develop some hypotheses about what is happening in the classroom. A well-meaning but inexperienced observer may short-circuit this vital process by trying to pinpoint the teacher's problems for him. Ideally, an observer is a servicing agent for the teacher, providing him with an alternative perspective, but it may be one which helps rather than hinders the teacher's understanding of the classroom."

In South African state schools, the facilitator has to allow the teacher space to come to "alternative perspectives", given the constraints that the state imposes on teachers. Facilitators could become dependable sources of affirmation and support to teachers who are wanting to break away from the strictly controlled teaching that is generally prescribed by the various departments of education. Facilitator and teacher should complement each other's expertise so that fresh awarenesses and understandings could occur. (Nixon, et al., 1979)

5.1.2 Sensitivities

At the outset of this project I assumed that Ginelle was ready and confident enough to have her teaching practice questioned. My assumption was strengthened when, while talking to her about questioning her practice she said:

"No, but I think it's good and I'm not at the stage where it will affect me." (1b, 071)

It became obvious, as the project continued, that she was not ready or confident enough to have her teaching practice questioned and closely scrutinised although I had specifically asked her if she would mind if the children questioned her teaching practice. She agreed to this. Rian, however, recalled that once before when they criticised Ginelle's practice she had become angry and this seemed to make him think that it was not acceptable to ask questions concerning her practice.

Ginelle did not seek to reassure him but asked him to recall what had happened. She asked:

"What did they (two boys in the class) do?"

Rian replied:

"Ask you to go and catch snails." (1a, 358)

I, as facilitator, should have taken very careful note of this little exchange. Initially this led me to believe that Ginelle would welcome opening issues concerning her teaching practice with the children, but Rian had raised a very good point: The last time they asked their teacher something about her teaching practice she had become angry. I should have been very sensitive to this and explored it with Ginelle and the class in greater detail.

I should have heeded Hull's (1985b) words. He stated that teachers involved in the project (which included children's views of teaching practice) were teachers who actually wanted to establish a collegial relationship with the children in their classes. I do not think Ginelle was ready for this at the beginning of our project.

My experience, gained from the project, made me very aware that the teacher concerned in a project like ours must be convinced that a democratic way of teaching is essential for the children to experience education and not merely schooling and then she or he must be willing to enter into the risk-laden situation with the children-participants. To determine if this is the case would require the facilitator to be exceptionally sensitive and perceptive during the initial meetings and negotiations with the teacher.

The facilitator must always be sensitive to the atmosphere that develops in the classroom while playback and discussion sessions are in progress. This would enable the facilitator to avoid ugly confrontations, as was the case in our last playback and discussion session, where Ginelle was very angry and started using the session to assert her authority. If I had not been so intent on remaining "the disinterested observer" I could have provided some input that might have tempered Ginelle's anger and frustration. (see encounter 2.6.25.)

The experience of being a facilitator has made me aware of how I communicate with people. It has made me aware of the importance of keeping quiet and allowing the other person to do the talking! I have become aware of being very sensitive to what people are saying. I have learnt that careful, sensitive listening is very important if true discourse is to take place between people.

5.1.3 Interviewing and questioning skills

One of the first awarenesses I came to was the awareness of the importance of questioning and interviewing skills. The way I phrased questions and comments would determine the success of the discussion and because of this awareness I was very conscious of myself as questioner throughout all the sessions.

I should have refrained from asking questions about Ginelle's teaching practice during the first playback and discussion session. It would have been more appropriate to ask Ginelle and the children about their reactions to and feelings about the videorecording on videotape and about seeing themselves on the screen. This would have given them opportunity to get in touch with how they felt about the issue. This, in turn, would help ease some of the tensions that arise on viewing oneself for the first time, too. Children react strongly to seeing themselves on screen and they really need the time to acquaint themselves with the idea of seeing their images on screen.

My experience of showing children videotaped lessons at Bellmore Primary School, while working on one of my course papers, should have made me aware of how inappropriate questioning during the first playback and discussion session would be. The children there were so-called "Indian" children, who do not resort under the so-called "white" schools and the policy of Christian National Education. These children do not have to cope with the very strict discipline found in "white" schools. (although they have to cope with other "hidden agendas")

They seemed much more spontaneous and much more vocal in their reactions to seeing themselves. Even if I had posed questions they would not have paid the slightest attention to me. By comparison, the children in Ginelle's class were very quiet when seeing themselves for the first time. It was easy to quieten them even further so they would listen to the questions. Their obedience

X
to me (the authority-figure) made it easy to impose my agenda on them.

I posed questions during the first session as I felt constrained by the time factor and I wanted to prepare the children for the session which would involve questioning.

It is evident that this first session left me feeling quiet unhappy and dissatisfied. I noted in my diary at the end of that particular day:

"I am still feeling very edgy about this whole project."

This was because I had approached the session with an agenda. I knew that having such an agenda was not what I wanted.

My first questions were lengthy and they seemed to block meaningful communication between myself, Ginelle and the children.

I tried gleaning as much information, from books, as I could concerning interviewing and questioning skills. Having read quite widely about these skills, I still posed lengthy, wordy and closed questions. e.g.

"That is something I noticed about Miss De Villiers. too, everytime you give an answer, that's something I've done all the years, too... so does Miss De Villiers, she repeats an answer you've just given her and then she usually says good or right after that. Have you noticed it, too?" (1a, 402)

This lengthy question gives rise to the answer: "yes".

I "learnt" from various books that an interviewer had to proceed very slowly giving the person/s time to get in touch with their feelings about that which the interviewer has enquired. However I hurried to such an extent that, at one stage, I asked two questions in one.

"How do you feel about being interrupted in your work?
... if you're busy..... How would you rather have the day? (ii, 652)

I should have given them time to consider the first question before rushing onto the next one.

I realised towards the end of our sessions that skilful interviewing is not easy and, that like most other skills, it has to be practiced. Even during the last discussion session my questions and comments are not conducive to opening the discussion so that participants feel free and safe enough to engage in the authentic exchange of ideas.

I have learnt that the facilitator's use of comments and questions must be very economical. These comments and questions must be kept to a minimum but should allow for maximum discourse to take place.

After my first question I wanted them to talk about the use of praise by teachers and my question to them is:

"And what do you feel about teachers doing that in general? Not only Miss De Villiers but I think most teachers tend to do that."

I received various answers from the children:

C1: "I think it's nice, because they say it louder, cos you can't always hear."

C2: "Yes, they give us all the answers."

C1: "You might not be able to write it in your test."

me: "That's quite interesting."

It would appear that most of my questions during this session had the same effect on the children.

My questions and comments did not seem to encourage them to start communicating their true feelings: for instance I asked the question as to how they felt about a teacher repeating an answer that a child had just given. The answer was very general, conveying nothing about genuine feeling:

"I think it's nice because they say it louder." (1a, 407)

I have come to realise that a trust relationship must develop between the participants before true feelings will be exposed.

The discussion was kept closed by the questions I asked. They did not explore their feelings while discussing the issue of boredom. I realised that they were not discussing the issue at a deeper level and actually saying why they felt themselves to be bored.

My questions did not seem to open up avenues of discussion but seemed to close them.

Often the question seemed to encourage them to repeat many of the things that had already been said.

I became very conscious of the fact that my questioning technique and the comments I made were not conducive to opening issues and then keeping the attention on them until something worthwhile and authentic had come from the discussion.

My uncertainty about my interviewing and questioning technique was reflected in my opening "question" of the playback and discussion session that was held on 20 October, 1986, concerning the second lesson that Ginelle had taught. (encounter number 2.6.18.) I asked:

"What I'd like us to do today is ..um.. look at this first part. You'll remember the lesson from last week when Sue was here, when she videoed last time... um... Miss De Villiers had the overhead projector and the transparency and you had the clocks... and you had to go and do the test, remember? And ...er... I just looked at the beginning part, the introduction and where Mrs Besaans gave you the instructions of what to do and all I

want from you is to look at... Listen to Mrs Besaans and what she's saying; ask yourself did you understand what she said. If you didn't - why you didn't understand that. Think of things that she might have said that would have helped you understand it and also look at yourselves and then you think to yourself, now what would Mrs Besaans have said about us. In other words what criticisms would Mrs Besaans have against me. What would Mrs Besaans say about me fiddling with my hair here or playing with the pencil under the desk and then - we want a list of those you see - and we also want things that you can help Mrs Besaans..... those things she'd say about you. We're also going to look at Mrs Besaans... when she's explaining. So those are the two main questions, this morning : We're looking at how Mrs Besaans explains how to go and do something, in other words instructions to do something. You're going to help us making suggestions to make you understand things better but then you're not only going to look at her you're looking at yourselves as well and how are you sitting listening and how you're sitting fiddling and then going to say but how can we help one another, in other words... How can I help Mrs Besaans and how can Mrs Besaans help me? Do you think it's fair to do that?" (ii, 1111)

Children: "Yeah". (ii, 1187)

me: "Are you sure?"

Children: "Yeah".

me: "Mrs Besaans, how do you feel about the instructions I've just given?"

Ginelle replied that she thought they were fair but then quite rightly asked the children if they understood. By this time I realised just how muddled and lengthy my question had become. I said that it was "just terrible" and give a very self-conscious giggle. I was very embarrassed.

I felt that the children could raise a legitimate complaint about their teacher's use of language when giving instruction. I asked them:

"When Mrs Bessaans said go ahead and do it did you know exactly what she wanted you to do? Didn't you know quite how to go about the test? Why didn't you know what you were supposed to be doing? (ii, 1821)

To this Lisa said:

"Because you (meaning the children) weren't listening"
(ii, 1832)

My comments and questions did not allow the children and their teacher to explore this idea and arrive at some hypotheses, instead the questions and comments seem to limit the discussion to the idea that the children should listen attentively to their teacher.

I should have given the children chance to explore the issue using their questions and comments so that where questions or comments were ill-phrased they could have time to adjust their phrasing. They would have felt more in control of the situation had I allowed them to make themselves clear on what they wanted to ask. Full control over their

questions and comments would have given the children more say in the playback and discussion sessions. I often intruded at crucial times when the children were about to question or comment.

The facilitator should have the skill to create an atmosphere or space that will facilitate in-depth discussion or discourse. She or he should be able to keep the participants talking about the issue that has been raised until a final agreement has been arranged. If this does not happen discussion tends to become vague and superficial.

5.1.4 Negotiated agreements

It should be part of the facilitator's role to keep record of all the agreements that have been negotiated and accepted by the participants. This should be written, audiorecorded or videorecorded. It would make it possible for the facilitator and the other participants to return to an original agreement to see if everyone concerned has done what was agreed upon.

I did not do this during our project and was unable to remind the participants about their original agreements. The children and the teacher in our project needed reminding about what had been agreed upon because they would deviate from what had been agreed upon and then, uncritically, accept criticism about their behaviour from each other.

5.1.5 Ownership

I approached these playback and discussion sessions with the greatest amount of care that I could muster.

Initially, I wanted to facilitate the project as described in the book A Room Full of Children Thinking (Hull, et al., 1985:8) The authors say: "As facilitators we were intent on adopting an open-ended approach which reflected our conviction that teacher research must from the outset be in control of teachers." (underlining my own) I wanted to adopt this style as I reasoned that it would only be if Ginelle had ownership of the project that anything meaningful, for her and the children concerned, would come from it. The importance I attached to this can be seen in the following extract from my diary:

"What worries me is that this is a project "from outside" it didn't happen at Ginelle's request. The project was imposed on her from outside. I hope that this will resolve itself sooner or later." (Day 1: 8 September.)

Nixon (1981) says that for a project of this nature to have any measure of success the teacher concerned should be able to adopt a strong, leading role within the research process.

Ginelle and I did not create the space for her to design the research questions from the very start. Ginelle was not confident or assertive enough to question the assertive role I had taken.

My assertiveness was caused by my concern that Ginelle did not know action research as such, and I thought that by letting the initial session take place as it did, I would give her an example from which she could work. If I wanted to give her an example from which to work I should have taught a lesson in front of the cameras and then invited the children's criticisms about my lesson.

I attempted to get her more involved in designing the research questions when I asked her:

"Where would you like to take it from here. Is there anything you would like to be done from now on?" (3b, 575)

Ginelle replied:

"Let's make it another lesson but I won't make it an introductory lesson. I'll make it a lesson where... they're busy doing something that they really know something about. So that you can see me either walking around or see the relationship."

I should have made a note of this and then my next question or comment should have led her to formulate a definite question or hypotheses around it. We could have then discussed it in further detail and planned the next recording sessions accordingly. This would have given her full control over the questions and she would have been able to take control over the playback and recording sessions, too.

This would have helped her to get in touch with her underlying thoughts and ideas about teaching, in general, as it would have forced her to think about what was important enough to her to warrant attention.

It was important to me that I would not be seen as anybody of great importance within the context of our project. It would have suited me to be considered "a piece of the furniture". (see Blease, 1983) This was only to be achieved later on in our study when I started going to the classroom every day.

I would have liked my role to be one where I supported and facilitated Ginelle's movements so that she could develop a new role: teacher/researcher. I would have liked to serve as a catalyst for Ginelle to rethink her belief systems. (Woodward, 1985)

5.1.6 My emotional responses to being the facilitator of the project

Conducting a study of this nature was no easy task. I was aware that I had no previous experience of working with a teacher in a situation like this. I was likely to say the wrong things at the wrong time, etc. I did not feel comfortable in the role of facilitator, during the initial period of the project, as is reflected in my diary: "I feel overwhelmed by what I am attempting." (Day 1: 8 September)

This role of outsider, in another teacher's classroom, proved to be emotionally taxing. Others in this role of facilitator have found it to be emotionally demanding, too. Elliot (1984) says that once the facilitator has been through a project she or he becomes extremely sensitive to the feelings of those involved and because of this lends a great deal of emotional support to those in need of it.

Being sensitive to other's feelings creates a tension within oneself. I found that as facilitator I, in turn, needed support and affirmation. It was not easy seeing the teacher and/or children become "upset" because I had invited awkward questions. During the discussion Ginelle and I had on October 20, 1986 (encounter number 2.6.18.) she said:

"... I'm so frustrated by you coming because I think it's awakening me."
(5a, 157)

I became very unhappy because of the atmosphere that prevailed during the last playback and discussion session. (encounter number 2.6.24.) It reached the point where Ginelle used the session to vent her anger and re-establish her authority. The children's facial expressions conveyed that they were unhappy. I felt responsible for this destructive interaction between the children and their teacher.

Rudduck (1985:124.) says: "Habit.... is soothing, non-provocative and anxiety free." I had rocked their boat of habit and it made us feel uncomfortable.

As the project progressed I found myself in a very difficult position as I was witness to many teaching strategies that I disagree with in the strongest sense. I found it difficult to keep quiet about them. In my diary, towards the end of the project, I wrote:

"I'm finding just about everything in this classroom irritating. I see children being subjected to a lot of pressure and "teacher knows best", etc. And I'm not feeling at all charitable about it." (24 October)

and

"I think seeing this kind of teaching is really depressing me. I must learn to accept my way may be right for me but on the other hand this doesn't make it (my way of teaching) right for Ginelle." (28 October)

I worked very hard at being diplomatic throughout the project.

The nicest part about the project was that I was working with people. The role of facilitator saw me interacting with children and I was able to share their warmth and spontaneity their generosity and affection. I was able to share their disappointments.

I worked alongside a teacher who came to regard me as a friend and confidant. I was able to share her hopes and ideals, her frustrations and disappointments. In short, we became friends. (Not a pay-off often received when studying for a higher degree.)

5.1.7 On being a facilitator ... concluding remarks

Looking back, I have been able to see that by going to another teacher's classroom I have caused "an awakening" as Ginelle described it. This, in itself, made the whole project worthwhile. This was the greatest "pay-off" for us all.

If I had to ever be involved, as facilitator, in a similar project again I would consider the following:

1. Is the teacher excited about the project in all its facets, i.e. the videorecording, the participation of the children during playback and discussion sessions, questioning his/her teaching practice?
2. Ask the teacher to record (in writing) exactly what it is that she/he would like to achieve in his/her teaching practice.

3. The teacher must spell out what "improving practice" means to him/her.
4. What facets of his/her teaching practice would the teacher be interested in examining, in view of what she or he is hoping to achieve through her/his teaching practice.
5. The teacher must have a choice as to who views the videorecordings and who takes part in the playback and discussion sessions.

I realise that what is set out above is not democratic practice if one considers that the children are not given an equal say in the matter. This is a compromise and I feel that as the teacher starts reaping the rewards of classroom research and gains confidence, so the children will begin to have more say. (Hull, 1985b) This could be then regarded as a point of departure that would, hopefully, lead to true democracy in the classroom.

5.2 REFLECTIONS CONCERNING GINELLE'S INVOLVEMENT IN THE PROJECT

Ginelle was to influence the playback and discussion sessions to a large degree. During the first playback session (encounter number 2.6.6.) she made quite a few comments. Most of these comments referred to the children and their behaviour.

It was not easy for her to accept the criticism of her physical features by one of the boys in the class. When he said: "Big nose" she retorted with:

"Wait till we see yours, Paul." (1a, 201)

Later during the session she directed our attention back to this issue. When she saw Paul's projected image. She said:

"Look at your nose, Paul, good gracious, it's standing out." (1a, 227)

I, the outsider, did not attach much importance to Paul's remark. Ginelle saw it as a criticism to be taken seriously. During the discussion that she and I had in her classroom on September 15, 1986 (encounter number 2.6.8.) she said:

"I must admit..... my nose still affects me now." (1b, 016.)

This, seemingly innocuous, remark made by a ten-year-old had a marked effect on his teacher.

Ginelle, at one stage, commented on her posture and hand movements. It would seem, that as an adult, she was more aware of her physical appearance than the children were. Hardly any of their comments had to do with their own physical appearance.

I should have provided for a time for her either to view the recording on her own or alone with the children. This might have provided for a growth experience for her and her class. I realise that Ginelle was feeling very uneasy about seeing herself on the screen. I had forgotten how embarrassed I had felt about viewing myself for the first time especially, in the presence of other adults. I should have kept this in mind.

Baker (in Holly et al., (eds), 1986) said that he found this period of viewing the lessons with the children of his class to be a shared and pleasurable experience. They could share the groans that were uttered when they saw themselves on the screen, they enjoyed laughing together at the fast forwards and rewinds and they were able to share their embarrassment and pleasure. Together they were able to share the feeling of being vulnerable.

It is difficult to decide if this was the case in our project. I found that during the first playback and discussion session (encounter number 2.6.6.) Ginelle reacted strongly to seeing her own image on screen.

It became apparent during the second playback and discussion session (encounter number 2.6.7.) that Ginelle was definitely not ready for comments concerning her teaching from the children.

A very sensitive issue was raised at this playback and discussion session. The children raised the issue at the second playback session (encounter number 2.6.7) that they were bored during Ginelle's lessons. I thought they had framed their critique very sensitively and gently. Ginelle, on the other hand, experienced their critique as being very harsh. She said:

"I think it sort of hurt inside, that it was pretty harsh, I thought." (3a, 24)

She described the children's comments as "attacking" and in our last discussion at her flat on 28 October, 1986 (encounter number 2.6.23.) she said:

"I was attacked from their end." (6a, 198.)

Her body language during the session conveyed just how withdrawn and threatened she was feeling. For a large part of the time she stood very quietly with her arms folded across her body and she did not look at anybody. She made a few comments but they were very short and did not communicate what she was feeling, in so many words, but listening to her tone of voice one could assume that she was most unhappy with the situation that had evolved.

Hull (1985a) states that by exposing oneself to critique from peers and pupils is not easy as one then has to confront risk from two directions at once. This was borne out by Ginelle's behaviour during this session.

During the discussion at her flat on 28 October (encounter number 2.6.23.) we were viewing the recording of the second playback and discussion session. When we reached the point when Odette commented on Ginelle's practice of giving homework as a form of punishment she said:

"That's a lie, I was quite upset" (6a, 357.)

Then she saw herself and took note of her facial expression and she said:

"Oh, see how upset I was by that." (6a, 358)

she added:

"Oh flip, I'm really cheesed off with that comment." (6a, 361)

Taking these comments into consideration it would become very obvious that she was upset and angered by the comments that the children had made.

During our meeting at her flat on October 6 (encounter number 2.6.10.) Ginelle emphasised that she really was not ready to have the children critique her work, and she said:

"You know I wasn't ready for that type of discussion, yet." (3a, 233)

It became very clear that Ginelle did not experience this as an opportunity to get in touch with how the children felt about her teaching practice. She experienced it as a very threatening situation.

Her feeling threatened was to influence the discussion sessions drastically. My presence could have contributed to the degree to which she felt threatened. I had assumed that, like me she would not object to outsiders in her class. I had forgotten that I had grown used to having outsiders in my classes, as I had regularly invited mothers to help in my classes. Ginelle was not used to justifying her teaching to outsiders.

She might have inferred from my behaviour towards the children that I was "on their side" so to speak. I tend to relate very informally to children and they seem to take to me very easily. The fact that I was now "competition" for their affection might have made the situation more threatening.

The fact that she did not know me very well also made it a threatening situation for her. I asked her (during our last talk at her flat: encounter number 2.6.23.) if she would be prepared to be involved with this method of research again and she said:

"Ja, but with knowing the person as I do now." (implying that she did not really know me at the outset of our project). (6a, 244)

and:

"I would most likely not say to someone "You can video me" if I don't know the person." (6a, 246)

It seems clear that not knowing me made her feel threatened when her teaching practice was taken under closer scrutiny by the children.

The fact that she viewed me as "an expert" because I was a Masters student could have contributed to this feeling. It was only afterwards when she saw me working in the class with the children as any other "ordinary" teacher would, that our relationship became more relaxed. She said:

"... you weren't a threat anymore... that's when you started taking the children." (6a, 256.)

and she went on to say:

"... the chats afterwards..... about what I felt and what you felt." (6a, 246)

I think that it was through these chats that she came to realise that I was no expert with all the answers up my sleeve. During these chats I exercised the greatest care not to criticise anything that she did in her class. I posed questions about things that she did, but refrained from commenting on her answers. So, gradually she became aware that I was not there to criticise her way of teaching. I had to prove that I would not criticise her teaching practice before winning her confidence.

It must not be forgotten that Susan was present in the classroom, as an outsider, as well. Wendy Flanagan pointed out to me, in our interview, that this additional intrusion would cause more tension and anxiety for the teacher concerned.

Ginelle experienced our initial sessions as very traumatic. Elliot (in Flanagan, et al., 1984: 142-143) says that he found that teachers generally needed to establish their own level of research. He found them to form the following hierarchy:

- "1. Listening or viewing recordings of their teaching situation.
2. Listening or viewing recordings and then systematically trying to note salient patterns in their classroom behaviour.
3. plus dialogue with a participant - observer;
4. plus dialogue with the students about pedagogic - values.
5. Triangulation controlled by participant - observer.
6. Triangulation controlled by the teacher."

I agree with these findings and stress the need for the teacher to have full control of the videotapes in the initial phase of the project.

In our project the videorecordings were in my possession all the time. I should have given them to Ginelle to view on her own to start with. Then, as she began to feel at ease with the idea of having her lessons videorecorded we could have introduced other dimensions to the project.

During our talk on 29 September, Wendy Flanagan also raised the thought that we might be proceeding too quickly and that she thought Ginelle, through her defensive behaviour, was indicating as much. She said:

"I (talking of Ginelle, here) as a class teacher actually want to be molly-coddled to a certain extent and I actually don't want to be rushed and I actually need to be taken very, very slowly with some gentle sympathetic assistance from you (meaning me), through to where I want to go."
(22, 225)

A teacher embarking on this type of research will have to be made aware of many of the implications that a project might have. It is difficult to decide how this should be done. Ginelle and I discussed this issue, about feeling hurt about the children's comments and questions. Her husband, Mark, who was sitting in on our discussion said:

"But what about educating the teacher to what she's going to feel before you have the video." (6a, 219.)

Ginelle then replied:

"It's a good idea, but you'll never feel the same..... its a good idea to warn them." (6a, 221)

Her feeling hurt and threatened made her focus on what she perceived as unacceptable behaviour of the children. Whenever a problem was identified she would not say anything to the effect that it could be teaching methods that were wrong. Instead she would say things like:

"I've got no bright kids to pull me out of that situation." (5a, 104)

and

"I'll explain but her mind wanders. I don't know if she looks at the flowers or something but you can see their eyes aren't focussing. (5a, 121)

While we were viewing the last lesson at her flat on 28 October, she saw herself on the screen and she said:

"Look how cross I'm there."

I asked her:

"Why were you cross?"

she replied:

"Because I've explained it so many times and I've given them rules to learn. When I give them rules to learn I expect them to learn it and they haven't, that's why I'm cross. I mean, they knew, I explained that 14 parts was 14 over 1000. And I explained that and expect them to realise that it's 3. They (emphasis) were not doing it the right way." (6a, 526.)

She was not willing to go back to her explanation to see if it was lacking in any way. It was easier for her to say that they (the children) were wrong.

This was a strategy she devised to protect herself in, what she perceived to be, a very threatening situation. This behaviour, besides proving that she was not ready to have her teaching practice exposed to outsiders and the children for scrutiny, stood in the way of creating a situation, where the children could feel free to comment on and question her teaching practice.

This behaviour was particularly marked in the last session. (encounter number 2.6.24.) I showed the extract, where she was very angry and accusing in her attitude, to two other M.Ed. students who are also engaged in studies using action research in one way or another. Both agreed that Ginelle had resorted to using our project as "the big stick" meaning, that she was using the session to assert her authority and they perceived her as feeling very threatened and they assumed that this was why she had resorted to this authoritarian behaviour.

If our project had continued I would have confronted her with this. I would have asked her if she would prefer to opt out or we would have to reconsider the issue of playback and discussion sessions.

It was as if we had come full cycle: our sessions had started with the children making Ginelle feel very uncomfortable and "hurt" and in this, the last session, it was Ginelle who was making the children feel uncomfortable.

It was clear that Ginelle was not experiencing these sessions and our project, as a whole, as an opportunity to explore the constructed reality of her classroom and as an opportunity to gain new insights and to achieve new levels of competence and confidence. (Rudduck, 1985.)

Ginelle would not be alone in feeling "stung" by student criticisms. (Lucas, 1984) Criticisms are not easy to handle, as Lucas (1984:9) points out "positive feedback is so much jollier to handle." The fact that these criticisms and comments were made in the presence of an outsider did not make it easier for her.

5.3 REFLECTIONS ON THE CHILDREN'S INVOLVEMENT AS PUPIL-PARTICIPANTS.

From the outset of our project I found the children to be very serious and honest about the issues they wanted to take up with their teacher.

The children never seemed to play up to me, the facilitator. I never experienced them as trying to say what they thought I would like to hear. A teacher, in the study conducted by Elliot (in Flanagan, *et al.*, 1984), said that the children tried to reason out the responses they ought to make. I cannot agree with this. He (Elliot) reported that some teachers said that the children were manipulating the facilitators and using them to erode the self-confidence of the teachers. I do not agree with this either. Ginelle agreed that the children never meant to be "mean". (3a, 217)

The children seemed uncritical of my questions and the issues they raised. During the second playback and discussion session (encounter number 2.6.7.) they did not express much surprise that some children thought ancient times meant 20 years ago, while others thought it might be 1000 years ago.

During the second playback and discussion session (encounter number 2.6.7.) one of my questions caused them to raise the issue of boredom during the first lesson. (encounter number 2.6.4.) It would appear that they did not feel it their right to criticise Ginelle directly. In fact their replies could be interpreted as seen to be very protective of Ginelle. At one point in our discussion Colette said:

".... you feel bored because you've got nothing to do. All you do is hear the teacher talk and our teacher our.... (slight pause) the teacher doesn't actually answer us." (ii, 466)

Colette changed her original use of "our teacher" to "the teacher". It is almost as if she wanted to keep Ginelle out of the issue. She distanced Ginelle by the use of "the" instead of "our". The fact that Collette chose to rephrase her question accords with Hull's (1985c) findings that children would generally phrase their critique very "delicately".

They did not once say that Ginelle chose boring work or a boring teaching method. Most of the pronouns they used referred to "we" or "they". They spoke more of themselves than Ginelle in their critique. This accords with Hull (1985c). He says that pupils would confine their criticisms to their own represented performance and that they were reticent to critique the performance of their teacher.

He (Hull) says that the teacher, in question, actually had to work hard to legitimise critique from the children concerned. This is where our project showed one of its weakest points. I do not think Ginelle was ready for the critique from the children in her class and she did not seek to reassure the children that it was legitimate to criticise her.

Some of the children needed this reassurance. It can be seen from various facial expressions and other body language on the video-recording. (ii, 530 and 537) Odette looked at her as if to say: "Is it permissible for me to say this?". (ii, 466, 486 and 490) Others did not look at her at all while they contributed to the discussion.

The children were protective of her, in the sense that afterwards one or two went up to her and put their arms around her, as if they felt she needed to be comforted. Ginelle recognised this as she said:

"Natalie's always around me.... when I'm hurt..... as soon as the video comes she's there to protect me." (6a, 187)

Children seem to exhibit this kind of sensitivity to what they perceive to be a threatening situation for their teacher. Hull (1985c) says that in their study the children actually approached their teacher afterwards to enquire if she felt "hurt" by what had been said.

It seems that some teachers question the ability of children to contribute anything meaningful and sensible to a discussion. The fact that primary school children were involved seemed to increase their doubt as to whether children could or would say something of value. Ginelle certainly doubted their ability to critique. She said:

"I just don't feel they know the total meaning of the whole thing.... I think that they're a little bit small to see that the teacher can improve...." (3a, 084)

Elliot (in Flanagan, et al., 1984) says that in the attempt by him, teachers seemed "extremely reluctant" to obtain feedback from children in their classes. One teacher, involved in this project said, "Young children cannot rationalise the problems we are posing to them. They are not capable of making true judgments on effectiveness of lessons." (Elliot in Flanagan, et al., 1984:140.)

My question is: If we do not ask the educatee; how are we to know how she or he experiences our teaching?

During most of the playback and discussion sessions the children were very serious about their comments. What they said seemed honest and sincere. Rowland (1984) says, too that as his experience of working with children increased, so it occurred to him that they were more rational than he had previously recognised. This seems to be a problem for many teachers, they do not perceive children as being rational and sensible.

A problem was identified by the children : they had been bored during the lesson. I invited them to think of possible solutions to the problem. They offered a few suggestions but they are not really encouraged by their teacher. Most of the time she stood very quietly and hardly looked at the children while they made their contributions.

The children were very sincere about their suggestions for alternative methods. They were very earnest in their attempts to be of help to their teacher. The fact that they were willing to suggest ways of controlling their own behaviour which Ginelle found unacceptable showed that they were prepared to meet her half-way.

I do not think Ginelle took them very seriously. If we had been working in the true democratic spirit of action research, these suggestions made by the children, should have been seen as vital feedback for the teacher and she should have accorded them with as much importance as a suggestion that she would have made. Only then would the children have experienced themselves as equals in the project and the scene could have been set for true and authentic dialogue to occur between teacher and learner concerning their constructed reality within the classroom.

Instead, the children, saw their teacher still very much in control of what was happening in the classroom and they were quick to realise that, in actual fact, they were as powerless to effect change as they had been before the project started. They were not to have a say in any meaningful change in the reality to which they were conscripts. There could be no true democracy within the project.

The teacher involved in such a study should have his/her own convictions about a democratic classroom and the rights of children to speak about their lived reality.

I do not think Ginelle had a firm and committed belief in democracy in the classroom. I think Ginelle is still a little confused about her teaching philosophy and not wanting to appear "old-fashioned" or conservative, which today in our teaching world, is a mortal sin, in the eyes of many, she might have held up a pretence of being a democratic teacher. Carr (1984) maintains that there is a mismatch between that which teachers think and say and what they actually carry out in their practice. This was clearly true in Ginelle's case. There was, indeed, a difference between her beliefs and her practices.

It is a pity that teachers are pressured into taking on ideas just because they seem fashionable. Ginelle has the right to take on whatever teaching philosophy she thinks best suits the needs of the children in her class. The fact that she might have felt forced to put on the facade of being a democratic teacher, actually made her very vulnerable. If she had felt at ease to say that she did not think the children would benefit from a democratic style classroom she would have been spared a very traumatic experience.

It is interesting to note that during the third playback and discussion session when the class was divided into two groups. (encounter number 2.6.18.) The group that Susan spoke to seemed more willing to actually say how they experienced Ginelle in certain situations. Their comments seemed to be more candid. They were asked to comment on the fact that Ginelle did not like the idea of them writing in their books while she was talking. Claire said:

"If Mrs Besaans isn't happy with you writing down.... she shouldn't hand out the books - so they can't write." (5b, 072)

When they were discussing the fact that Ginelle often made them rub work out and do it over, one child said:

"..... the children say "aw jeez" then she gets angry."

to which another child added:

"She gets angry and sulky." (5b, 125)

This situation where the teacher is not present and where a facilitator is involved could be a valuable source of information for the teacher, if the children gave consent to her/him having access to it. If I had thought to conduct the following two sessions along these lines, i.e. without Ginelle, we might have avoided the tension and negative atmosphere which was evident during the last two sessions.

Dividing the class into smaller groups would also serve to break the formal atmosphere that usually exists in an ordinary, traditional classroom. Boydell (in Chanan, et al., (eds), 1975) found that in this formal situation the children tended to adopt a passive and stereotyped role which made it difficult for the observer to gauge how they really felt about that which they were being asked.

Dividing the class into smaller groups should be a serious consideration of any facilitator. It seems to make for a more "shared" type experience and where the teacher is not present the children seem to be more willing to contribute. The teacher's relationship with his/her class would also determine how much the children would be willing to say in front of him/her.

5.4 CONCLUDING REMARKS

Towards the end of our project Ginelle and I realised that our teaching philosophies differed greatly. She said:

"... as I'm saying, I'm different to you." (6b, 431)

Ginelle raised a good point when she said:

"Maybe you should actually get to know the teacher before (starting a project)" (6a, 362)

I would think this necessary where a teacher is still very unsure of herself/himself and as to where they stand as regards their philosophy and basic theory of teaching. I do not think that this would be crucial in a situation where the teacher concerned has a strong and committed belief in that which she or he is trying to achieve. In the latter case the teacher concerned would have a theory against which to test a hypotheses whereas in our case Ginelle's confusion as to what she was hoping to achieve through her teaching did not give her a very strong framework against which to test a hypotheses. (see Carr, 1984)

Because Ginelle and I had not formulated a basic question or hypotheses before the recording and/or playback sessions we tended to raise too many questions. Our research was therefore not focussed and directed enough.

It was difficult to stay a neutral outsider in a situation that concerned many of the things that I hold dear to myself. I often asked myself if I was not denying my own humanity by trying to keep my "person" out of all the discussions and talks with the children and Ginelle.

My greatest regret concerning these sessions was the fact the last playback and discussion session (encounter number 2.6.24.) generated a very negative atmosphere. The children were subjected to harsh criticism which they seemed to accept with resignation.

This last session was destructive, in the sense, that it did not bring the children closer to Ginelle; instead it widened the gap and it was as if we were back where we started: the children on one side and Ginelle on the other. We were back to the situation as described by Hull (1984) where the teacher was trying to "cope" with the pupils and the pupils "coping" with the teacher.

If our discussion sessions had generated true discussion and dialogue we could have had the situation where teacher and children could experience themselves as confronting the same problem together. It could have made for a more familiar atmosphere in the classroom. (Hull c, 1985)

I feel that this negativity could be overcome with careful planning and negotiation. I believe that in a project such as ours it is imperative for the facilitator to remain as open-ended in her/his approach as possible. The teacher should be "molly-coddled" and treated with the utmost care and sympathy so that she or he could slowly and surely gain the confidence so as not to feel threatened when exposing his/her teaching practice to the scrutiny of the children in her/his classroom. When this happens both teacher and children can work towards: "a pedagogy which may serve teachers and pupils in educational resistance to the forces of schooling." (Hull, 1985b:31.)

I remain convinced of the importance of the role to be played by the facilitator. The facilitator can bring to these playback and discussion lessons skills that a teacher might not have e.g. interviewing skills. The facilitator has more time to take care of practical arrangements concerning the equipment that is used to record lessons and playback/discussion sessions. The facilitator is there to provide support and affirmation to all the participants. (Lovegrove in Kemmis, 1982) The facilitator can assist in the process of reflection: she or he may not intrude and interpret the data but can provide the circumstances, by sensitive questioning, that could lead to authentic insight. (Kemmis and Grundy in Flanagan, et al., 1984) A facilitator should see their main task as supporting and sustaining the teacher/s who are engaging in this type of research. (Nixon, 1981)

When the teacher and the children can, by using a facilitator, come together as equals and authentically discuss the socially constructed reality that exists in their classroom then we, as educators, can talk of true education. However, while the children and the teachers remain submerged in what Freire refers to as a culture of silence, there can be no talk of education.

CHAPTER SIX

THE EFFECTS AND RESULTS OF THE PROJECT

6.1 INTRODUCTION

The project started with the intention of effecting an improvement of teaching practice. The project succeeded in making all the participants more aware of issues within the classroom. The participants (Ginelle and the children) were directly affected by the fact that they were able to see themselves on the screen of a monitor, within the lived reality of the classroom. They were to be affected to a greater or lesser degree by my intrusion into their lived reality.

Results of the project were not merely to be confined to the actual teaching practice, but our project was to affect relationships and attitudes, as well.

I was to have an influence on quite a range of issues, most of these being relationships. Ginelle worked her way through many of her thoughts concerning the children, the staff and the schooling system with me. It was as if I was a "safe" person to confide in as I was not part of the life - world that she was trying to make sense of.

I was not deeply involved with the children but I knew them and I was interested enough in them to listen carefully when she spoke about them. I had very little contact with the other staff members and there was little likelihood of "stories" finding their way to people for whom they were not intended. I was not part of the school or the educational system and could not hold any criticisms that she might have against her.

The amount of time we spent discussing these issues varied. It seemed as if Ginelle needed to talk about these issues. It is as if she was trying to make sense of her relationship with the children, her place within the hierarchy of the staff, and how she was experiencing the system that operated within the school. Judging by her need to do this, one wonders, how other teachers cope with the need to make sense of their lived realities of school life.

All the results of the project were not noticeable immediately. It has been "a long term investment". I realised this because I meet Ginelle occasionally and every time she has commented on new awarenesses about her teaching practice, which she attributes to our project.

6.2 GINELLE

The project affected Ginelle in quite a number of ways. It affected her teaching-day and timetabling, it affected her teaching practice, it affected her ideas about her physical appearance and it affected relationships with the children in her class, the headmaster and even her husband.

6.2.1 Ginelle's teaching practice

Going to the school with the equipment caused Ginelle to have to reschedule lessons and lose teaching time. The playback and discussion sessions never took less than one full period of her teaching time. The videorecording of lessons she taught never really intruded on her teaching time as we set up the equipment

during so-called transition periods in her classroom. This was a time when some children would still be busy with work while others had already finished their work.

During the second playback and discussion session I had with her (encounter number: 2.6.8) I asked her if our intrusion had affected the rest of her school day. Her answer:

"We carried on with what you were doing..... they were very excited.."
(1b, 027)

indicated that she did not seem perturbed that teaching time was being used for the playback and discussion session.

The use of teaching time could be a source of concern to teachers, who feel that they have much important work to do with the children. It would seem that teachers, in general, were concerned about the amount of teaching time that was lost in action research projects involving technical equipment. Overall, they felt that the time lost was well worth the rewards that were gained from such a project. (Hull, *et al.*, 1985) Although they felt anxious about using teaching time for discussion sessions with the pupils, the teachers felt the advantages of authentically involving the children in the discussion, of that which makes up their life-world, were valuable for both educator and child.

The fact that Ginelle could sit down in the privacy of her flat and see herself teach was rewarding for herself. She said:

"... the video at our place (the flat) was rewarding in that I could sit down and actually think about what I..... even though I was talking... I noticed that I was talking a lot and pointing at the children....." (5a, 293)

She did not say exactly what it was that she could think about. She was confronted with herself and her way of teaching this forced her to think about what happened within her classroom. She said:

"I might get angry seeing it on the video but I must also realise that they're doing it for a reason." (5a, 171)

I interpreted this as: she would get angry with the children who walked around or engaged in other unacceptable behaviour but the fact that she could "re-view" it, forced her to think about the reason behind the behaviour. She said:

"... if you don't see it you're not going to think about it and with the video I have really thought." (5a, 163)

This seemed to have an unsettling effect on her, as she said:

"I'm so frustrated by you coming because I think it's awakening me. It's sort of telling me that there's a lot of stuff I'm not doing right." (5a, 158)

and:

"It's (the project) been good because you wake up to what's been going on in your teaching." (5a, 411)

She said that she considered the videorecording of a lesson to be a good idea, as she found it very easy to recall exact situations.

Ginelle: "... you know which child you were talking to and also which children weren't listening... you can recall much more easily." (6a, 024.)

The relative permanency of video recordings allows teachers to return to recordings repeatedly and check on observations. Others (e.g. a facilitator) could be invited to view the recordings with the teacher and this allows for a comparison and sharing of observations. (Boydell in Chanan, et al., (eds),(1975.)

The fact that the recordings made it easy for her to recall situations facilitated her thinking about those situations. She was given the opportunity to pause for reflection on her practice. (Baker in Holly, et al., 1986.)

This opportunity for reflection on her teaching practice was to bring about some changes. She said becoming aware that the children were confused about her use of phrases like "those days" and "ancient times" made her start discussing certain issues, in more detail, with the children. Ginelle said:

"But I think it (action researching) can actually better one. ...We (were) busy doing Samson and I'd discussed the torches of those days... I explained what a torch was like.... not a battery torch but it was just a piece of wood... and that was very meaningful to them (the children in the class) because they started drawing that way." (3a, 205.)

She attributed the awareness (needing to explain in greater detail) to having seen her lesson and the question I had asked during the second playback and discussion session. (encounter number 2.6.7.) Ginelle said:

"... you had made me sort of aware ... to be more explicit..." (3a, 209)

An awareness that she came to on her own while viewing one of the lessons was:

"I realise the more I'm saying, often I must be speaking to nobody." (5a, 101)

Another awareness was:

"... thinking back on the video; I don't use the board enough..." (5a, 138)

At the outset of the project I realised that I was not in Ginelle's classroom to criticise her teaching practice. However I raised questions. I think sometimes she saw these questions as indirect criticisms. During our discussion on September 15, 1986 (encounter number 2.6.8.) I raised the issue that there were times in her class that quite a few children walked around with seemingly nothing to do. I said:

"I've noticed quite a few children are sitting... doing nothing for such a long time." (1b, 140)

I did not intend the remark as a criticism. Ginelle immediately answered:

"It was a bad lesson, I admit." (1b, 142)

It was as if she thought I hinted that this was a "bad thing" to do.

Another issue I raised concerned Ginelle's practice of asking children, who had all the given problems correct, to stand. She would then ask those who had one answer wrong to stand, then those who had two answers wrong, etc.

I suggested that this caused the children to feel that they were being pressured to achieve and even if a child had done very well, considering his/her level of development, they could still have very negative feedback, about themselves, in this type of situation. I stressed that this was my (very personal) view. I said:

"You must realise that this is my idea." (6b, 428)

Mark, her husband, agreed with me, using examples from his own school days. She said:

"Ja, it's something I've got to think about. I'm probably different to you. I enjoy that pressure. (6b, 430)

It appeared that, although, Ginelle viewed many of my questions and remarks as indirect criticism, they still provoked her to think about the issues I had raised.

Co-ordinators of projects of this nature have found that the projects have compelled teachers to pose questions like: "Why am I teaching that? Should I be? Is it effective? and "What is best for the children?" (Holly, 1984) Ginelle had not verbalised her questions or comments but I gathered from what she said that she had started thinking about many of the things that she did in the classroom.

I think it could have been an enriching experience for both of us if she had told me what she had started thinking about. Together, we could have worked our way through some of the questions and the action research cycle could really have been set in motion. Ginelle probably did not feel safe enough to do this. She was not yet ready to open up about her teaching practice.

The exciting part of our project is that Ginelle has been made "aware" and as she said she has been "awakened" to the possibility there might be flaws in her teaching practice.

6.2.2 Relationships with the children

Ginelle related negatively to a number of the children in her classroom, when I started going to the classroom. Some of her comments concerning various children were:

"He will show off... jump and act... (he is) incredibly painful but now that he is on Rittelin I can cope with him." (1a, 001)

and of the same little boy she said:

"...the first two terms he was so impossible. I used to come home and didn't want to go to school because I couldn't handle him. Secondly, he didn't like me." (5a, 316)

"S. has a paralysed mouth. I don't feel sorry for her at all. She is very lazy and doesn't work well." (1b, 178.)

"This is little A. Him and I don't get on... Ever since that day he's disliked me. I don't know, I like him as a child... I've made an effort to like him but he'll steer clear of me, he won't come and tell me things... He is naughty... he's doing it to get me. He hates school... he is not interested. (1b, 204.)

It is evident that she had a problem relating to these children and others. She admitted that there were a number of children that she "disliked" and that she could not "handle their personalities ". (5a, 323)

I raised the issue and said to her:

"I have noticed that there are some children you keep at a distance."
(5a, 312)

I would like to think that forcing her to confront and talk about the issue caused her to reflect on it and that this reflection led to an improvement in the relationships with the children concerned. During our last talk together, (encounter number 2.6.24.) Ginelle asked:

"Are there still children you think I avoid a lot or dislike?" (6a, 620.)

I regret not reflecting the question back to her as I think she was seeking an opportunity to work her way through her feelings concerning these children. Instead, I answered her and said I had noticed an improvement in the relationships in general, although she and one particular girl in the class clearly did not get on.

Our project forced her to reflect on her relationships with the children. She said:

"It's (the project) been good because you wake up about what has been going on in your teaching. I must admit there were times when I used to just check over what I was going to do for the day... see that I've got everything organised on the way to school. Now I sit and think who must I like today? Who must I make an effort to like?" (5a, 411)

The improved relationships with various children in the class and with the class, in general, accords with the findings of Baker (in Holly *et al.*, (eds), 1986.)

The fact that the project forced Ginelle to take a closer look at the children in her class is supported by one of the teachers involved in the Children Thinking project (Hull, *et al.*, 1985: 95.) The teacher "One of the greatest benefits... is that I have looked much more closely at the children I teach."

I feel that these improved relationships with various children in her class was one of the most important results of our project. Ginelle and the pupils of her class experienced an improved relationship and, therefore, a more pleasant classroom atmosphere.

6.2.3 Using me, the outsider, as confidant

Ginelle saw me as a "safe" person with whom she could share her views of other staff members and the schooling system as she was experiencing it.

It was her first year at this particular school and she was feeling alienated. Our project took place late in the third term and it became evident that she was still feeling lonely. She said:

"This year I'm on my own. The teachers I'm working with don't really want to help you, in the sense that you might tread on their toes..." (3a, 412.)

and

"It's amazing we're good friends and go out together but it's not friends. It's sort of a stiff type of friendship." (3a, 493)

She spoke of how she saw the other staff members in terms of their teaching abilities and their openness to new ideas. She said:

"You know they're excellent teachers but they're almost over-excellent. They work so hard and they do so much that they don't actually have time for ideas which is wrong." (3a, 284)

On other occasions, she spoke about how the other teachers exercised discipline and how they would attempt to control her teaching practice by commenting on it. I think she welcomed the opportunity of having a sympathetic ear as she said that she found the chats we had to be "nice".

Ginelle also spoke about how she experienced the system that existed within the school. She found very little affirmation forthcoming from either the headmaster or her colleagues and felt irritated by it. She sounded very frustrated and it worried me that her frustrations could find no other outlet than by talking to me. These frustrations would surely influence her interaction with the children. She said that she would try working on her own the following year and sustain herself. It is a pity that professional people have to feel this way about their work situation.

6.2.4 Awareness of her physical appearance

Ginelle found that seeing herself as a projected image on a screen made her self-conscious about her physical appearance. She became self-conscious about her nose and her posture. She said:

"You're seeing your own image which might not be up to your standard... there you're seeing yourself... you look at yourself in the mirror and you've got an opinion of yourself... it's bad enough seeing yourself." (6a, 199)

She implied that it was not a very pleasant experience seeing herself on the screen.

Not all the awarenesses about her physical appearances were negative ones. During the last discussion at her flat, (encounter number 2.6.23.) while viewing the lesson, she saw herself from behind and remarked that her hair was longer than she thought and it looked nice.

Ginelle: "See, now my self-image has gone up." (6a, 488)

Ginelle said that she thought becoming aware of little habits was important. While viewing one of the lessons she became aware that she would often fiddle with her ring. This was a habit that she was unaware of.

Ginelle also made the discovery that she wore the same clothes on two successive Mondays. She said:

"I've noted twice on the videos that I've worn the same clothes on a Monday... The children must notice that I wear the same boring clothes." (5a, 255)

6.2.5 Other results

The headmaster requested to attend one of our playback and discussion sessions. We invited him to the session on October 23. (encounter number 2.6.19.) He seemed to think what we were attempting was a very good idea. Ginelle said:

"He was very pleased. He said the reason why they aren't videoing (lessons) is that they don't have a carrying around machine (the portapack) like you've got. But he is going to get one." (6a, 002.)

Ginelle said the headmaster then asked if she would be willing to explain to the other teachers how to go about setting up a research project. This encounter between herself and the headmaster opened up avenues of communication that had not previously existed. If she could be the co-ordinator of such a project it would enhance her status amongst the staff as well.

Viewing the videorecordings of their lessons and of the playback and discussion sessions was to have another "pay-off" that I had never even considered. Ginelle and her husband, Mark, found that viewing the recordings together gave Mark a valuable insight into the Ginelle's work situation. He said:

"I find this extremely stimulating."

me: "What?"

Mark: "Just listening to Ginelle talk about her work. It gives me an insight into what you do (talking to Ginelle). You know, you're always telling me about it and I have to relate what you're telling me... to my own experience which is pretty limited, subjective."

Ginelle: "I'm glad Mark sees that. It's nice for him to see the children I talk about." (6b, 665)

I would like to think that our project enriched their relationship. Ginelle's work situation could become a shared situation through the medium of the videorecordings.

6.3 THE CHILDREN

Unfortunately I never obtained feedback from the children as to how they thought we (Susan and I) affected their life - world, within the classroom. Ginelle said the following:

"They're (the children) very interested in who you were and why you were there and Sue. I explained who you were and they also wanted to know everything about the cameras... where they come from..." (3a, 093)

and

"They (the children) liked two people coming because you weren't wearing the ordinary clothes I wear... Susan had takkies on and they enjoyed (that) ... they enjoyed having you ask them questions like that." (1b, 031)

We caused the children to perceive that they had to be "good" when we were there. Tudor said during the second playback and discussion session (encounter number 2.6.7.):

"Well, I know why she was saying, "Keep quiet," and that; because she had visitors and she doesn't like having naughty people when she's got visitors."
(ii, 0942)

I, the outsider, probably influenced some of the children by my contact with them during the days that I went to the classroom and helped Ginelle with little tasks in the class.

Whenever I questioned the children about their feelings concerning our project I elicited broad grins and enthusiastic comments. They thought having the camera and other equipment there in their classroom was very exciting. Their class was the talk of the playground, during breaks. I asked them if they thought that seeing the videorecordings had affected them in any way. Their answers indicated only that they thought it was a "brilliant" ideal.

The children saw it as a break from the boredom that filled their days in the classroom. They thought our project was a good idea because it relieved the boredom. It saddened me to think that this class of lively ten-year olds depended on us and our equipment to bring relief to their boredom.

I think it would have been a good idea to actually interview small groups of children to find out how they experienced the project. I should have arranged to go back after a few days and interview them in groups of three or four. These interviews should have been recorded on audiotape.

6.4 CONCLUDING REMARKS

I am convinced that a number of subtle changes occurred within Ginelle's practice due to our project. Not all of these changes were overt ones concerning actual teaching practice. Many of them concerned attitudes and ideas. These changes are the most difficult to measure and become aware of immediately. These are the changes that would only manifest themselves over a longer period of time.

I feel that if these changes could be brought about in our project which was beset by many problems, as is usually the case when trying something radically new, then so much potential lies in another project which is planned and conducted from the awarenesses that have arisen from this project.

CHAPTER SEVEN

CONCLUSION

7.1 FUTURE PROJECTS

Our project made me aware of a number of issues that I would regard as important when and if I should ever attempt another project of this nature. These issues are important but cannot be regarded as rules or regulations for an action research project. If they were to be regarded as "rules" it would be defeating the entire spirit of action research.

7.1.1 Approaching other teachers

If the project is initiated by an "outsider" i.e. a university based student/researcher then the way in which the teacher is implicated is of prime importance.

It would be a good idea to approach a number of teachers and explain what is meant by action research. Where triangulation is to be used the teachers must be made aware that their practice is going to be criticised by their students. They must be made aware of the underlying ideology of democracy that is inherent to action research. When teachers have been made aware of the nature of action research they should be given sufficient time to consider whether they would like to be involved in a project of this nature. Only then should they be asked to commit themselves to such a project. However they should be aware at all times that it is their right to withdraw from the project whenever they wish to. (Hull, et al., 1985)

Facilitators should spend time developing dialogue and negotiating views about the project, taken for granted assumptions and teaching practice as it is carried out by the teachers involved. (Morrison in Chanan and Delamont (eds.), 1975)

It would be a good idea if a network of teachers engaging in action research could be established. This could then create the climate of sharing which is such an important aspect of action research. When teachers start sharing what happens in their classroom it creates the possibility for professional growth. This process of sharing in turn, creates the opportunity for authentic discourse amongst teachers as they discuss their experiences with one another.

Involving other teachers would help overcome feelings of isolation and alienation that could be experienced if only one teacher was involved in such a project. These teachers could provide the necessary support and affirmation for one another.

The group of teachers must not be heavily controlled. Formal organisation should be avoided. It must be very lightly "directed". The group processes should always be conducive to the free flow of ideas. It must be approached with an "open agenda". (Nixon in Nixon (ed), 1981) Leadership must shift and change constantly within this group.

Teachers must be made fully aware of the time they may need to become involved in an action research project. It is important that teachers keep a record of everything that is done and agreed upon. This record could then later be "edited" with the purpose of sharing it with other teachers.

Time is also needed to engage in discussion with the facilitator. A normal school day does not have all the hours necessary to provide for a discussion time with the facilitator. Teachers involved in a project will have to be willing to give of their private time.

Teachers should undertake this type of project with a sense of curiosity. Stenhouse, (1979) says that if inquiry is not rooted in curiosity the research will suffer.

The teachers who become involved in this kind of project should be interested and willing to involve the children in discussion about their teaching practice and they should be willing to pay serious attention to what the pupils say. There is no room in this kind of project for teachers who make a few paternalistic gestures towards the children in their classrooms.

7.1.2 The school, headmaster and other staff members

In any other action research projects I would seek to involve as many of the other staff members as possible. This is important as it makes everyone aware of what is being done as far as the project is concerned.

The teachers who are fully involved in the research project would be thus capable of overcoming the feeling of being "different" and one of the "lunatic fringe".

Having the approval and positive encouragement from the headmaster would give the project status within the school and it would not be seen as a sinister activity engaged in by some teachers.

If one could involve other staff members it might encourage them to engage in some similar action research. It is only when other staff members are involved that the influence of action research can spread and thus changes might occur that might have remained in the private possession of only a few. (Rowland, 1984) It could help facilitate the exchange of ideas amongst teachers.

The headmaster and other uninvolved staff members cannot be expected to be responsible for the smooth running of an action research project. This must remain the sole responsibility of those engaged in the research. It is their duty to find ways of carrying out the research within the constraints and limitations of the school-system. (Nixon, et al., 1979)

If the facilitator is to be based at another institution e.g. a training college or university it would be better if the schools involved in the project be within comfortable travelling distance. I found the distances that I had to travel to and from the school and university to be extremely tiring and I wondered if this did not affect my interaction with the children or Ginelle.

7.1.3 The children

It would be useful to know which children spoke often in a large group situation and who were the quieter members. It would be a good idea to find out if the quieter ones would be willing to share ideas when spoken to on their own or in smaller groups. I think it would make for a happier atmosphere generally if the facilitator knew the children a little more intimately when playback and discussion sessions started.

I, as facilitator, would organise that playback and discussion sessions took place in large and small groups. I would interview children singly and in pairs if the situation warranted it. I would not use only one method as was the case in the project with Ginelle.

I would also want to arrange sessions where the teacher is not present and then negotiate with the pupils as to what data could be made available to the teacher.

7.1.4 The camera – person, recordings and equipment

Because I found the videorecordings to be the ideal way of recording the teacher's lessons and the playback and discussion sessions I would again use a vcr. I found that audio recordings of the discussions that Ginelle and I had to be more than adequate and feel that it is the ideal way of recording meetings where the noise level is not too high and where there are two or three participants. The tape recorder is inconspicuous and it is easy to press the "pause" button, if necessary.

If possible I would transcribe all recordings (video and tape) as this would be much easier to refer back to for purposes of a written report or even when referring participants to a given instant within a situation.

If a teacher wants to research his/her own practice without contributions (questions/ comments) from the facilitator during playback and discussion sessions then the facilitator could act as camera-person. However, I found it difficult to provide input during a session and do the filming. If the teacher wanted the playback and discussion session filmed but also wanted the facilitator to ask questions concerning a lesson then it would be better to have a camera-person who would be responsible for the filming.

7.1.5 The facilitator

The facilitator could be involved in the project as a resource person and a consultant. She or he could give support where it is needed and could provide feedback for the teacher. The facilitator could act as a "go – between" in the initial stages of triangulation where students and teachers are involved. The facilitator could be the disinterested third party, who should provide a different and, hopefully, an unbiased perspective on what happens in the classroom.

More appropriately, in our racial South African schools, which operate within the constraints of apartheid, the facilitator could be the one to pose "awkward" questions about the teacher's practice. This could be a way of making the teacher critically aware of her/his life-world. As an outsider, the facilitator is likely to see that which takes place within a classroom in a different way. The facilitator is not submerged within the lived – reality as are the other participants.

During our project it was easy for me, as outsider, to determine which children Ginelle did not relate to well. It was easier for me to see as I was the outsider, whereas Ginelle was caught up within the situation and it was not as obvious to her.

Interviewing skills are very important. I found that it was only by practising these skills that I managed to learn about them. I found reading about them merely made me aware of what I should be doing but it did not enable me to become skilful at interviewing.

I found that becoming involved with the children and the teacher in the actual classroom situation created a friendlier and more honest relationship and this helped to make the project more pleasant. Ginelle started feeling safer with me, once she felt she knew me better.

In a project like ours where the teacher was feeling very threatened it would be important that the facilitator should work towards establishing a very close and friendly relationship with the teacher. However, in a situation where the teacher is confident and not as threatened I do not think it would be as demanding.

As a facilitator, I must be able to help the teacher actually formulate hypotheses and/or questions. The teacher can then feel the research has a certain focus and that they are actually working towards something.

7.2 WHY IS ACTION RESEARCH WITH TRIANGULATION SO NECESSARY IN SOUTH AFRICAN SCHOOLS?

Triangulation is necessary in our schools as it gives those people who are involved in the process of schooling an opportunity to confront openly and honestly the underlying ideologies of classroom practice. Opportunities could be created for teachers and students to come together in authentic dialogue about that which shapes their lives in their life - world of the classroom.

The present education crises experienced in our country emphasises the need for the educatees to meet with the educators in dialogue about the education that is to take place.

The improvement of schooling experienced by many students depends on the development of the art of teaching which can be achieved by using action research with triangulation. (Stenhouse, 1979)

Triangulation offers a starting point. Teachers could create an opportunity for students to question teaching practice and subject content. Triangulation offers the opportunity to maintain a questioning attitude amongst learners and teachers.

Embedded in the idea of action research and triangulation lies the possibility of opening up the classroom and what happens there for discussion amongst parents of the students.

Action research, with emphasis on triangulation, has embedded in it, the possibility for the democratisation of schooling. Through it, participants could have a say in the everyday events in the classroom and bring about change in their lived -reality of their classroom. Those issues which cannot be changed could, at least, be scrutinised, exposed and thoroughly talked about. These issues need no longer be accepted as taken - for - granted realities. Learners and teachers could experience themselves as in control of their lived - reality.

However, this cannot be achieved without teachers being willing to involve themselves in this type of research. In our country where many teachers are not open about that which happens in their classroom they would have to be educated to the idea that they are not perfect and that they are quite entitled to making mistakes

by virtue of their being "human". This attitude of "being human" is not always encouraged at training institutions. As Ginelle said during one of our talks together:

"...at college you get the impression of doing everything so perfectly right...." (3a, 376)

It has often been the case in our schools that teachers who are willing to admit that they have problems in the classroom are often regarded as "problem teachers". Nixon (1984:76) says that to enable teachers to feel at ease with the idea of opening up their practice for others to look at needs "an alternative climate in which individuals can openly identify with each other's classroom concerns."

Action research, and triangulation in particular, when shared with other teachers can provide for a body of information concerning teaching practice. This information is a self-generated "knowing" about the lived realities of the classroom. It is information that other teachers can readily identify with. Information that is disseminated can be used and adjusted to the needs of other teachers. Thus a very own South African educational research could be developed by the teachers themselves. As this body of knowledge is used and developed so it could provide professional development for teachers. It could be an enriching experience for participants who co-operate and share expertise. (Nixon, *et al.*, 1979)

Teachers actually engaging in activity (praxis) to change the existing reality within the classroom undergo a change in self-image. They experience themselves as initiators of change. They are no longer carrying out directives from others. They have the opportunity to become artists: creating their reality and reflecting on it. This is then the potential towards professional growth and development that action research holds for the teacher. (Jackson in Nixon (ed), 1981)

For South African teachers this could come to mean a great deal. In most primary schools for whites a headmaster or head of department might visit the class, check up on the teacher, make a few suggestions and then leave. No further communication takes place. With action research there is a cyclic feature which makes one reflect on changes. The growth that occurs with this reflection on practice with a "disinterested outsider" is more beneficial and more satisfying. Ginelle said:

"I found this more interesting than when the vice-head or head of departments come in because they're normally Std. 5 teachers who actually can't remember what it is like in Std. 2... I'm almost scared of them because you know they won't understand..." (3a, 552)

Teachers who have been inadequately trained could benefit enormously from action research and the sharing of experiences and knowledge that goes together with action research. Rowland (1984) found that by extending the numbers of teachers who contributed they not only strengthened the research that was being done but found that they, had in effect, embarked on an in-service training program.

I feel that it is these two effects of action research, namely professional development and the democratisation of the classroom, that are the most important ones considering the schooling systems that exist in South Africa today. Both could be achieved, if action research with triangulation, is used.

"The fact is that a school contains two societies - that of the pupils and that of the teachers. Whilst this state of affairs exists, it is difficult for each party to understand the other, and respect wears thin. If the two parties could mix at all times during school hours..... then I feel sure that both sides would begin to show a certain respect for each other. After all, by discussing problems of method with the pupils themselves and generally joining in on their society, a greater understanding between the two generations will occur..."
Richard, 17. (in Blishen (ed), 1969:136)

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APPENDIX A

8 September 1986

PLANNING FOR SECOND SESSION.

- * Ask Ginelle for any awarenesses after last week.
- * Ask the children for any awarenesses.
- * Refine questions and explain why you, as observer have come to these questions.
- * Suggest questions such as:
 1. What do students think needs to be done to make their classwork more interesting?
 2. How can more students participate in the lesson?
 3. Eye-contact with students and body language : awarenesses.
 4. What are Ginelle's "teaching-values"?
- * Is she aware of:
 1. anything to be improved?
 2. ideas she would like to try out?
 3. things she can do nothing about within her own classroom situation?
- * Is there anything she is unhappy with?
- * Is there anything that perplexes her?
- * Are there any sources of irritation as regards her classroom situation?

UNIVERSITY OF CAPE TOWN

FACULTY OF EDUCATION

COURSE PAPERS

presented in partial fulfilment
of the requirements for the Degree of

MASTER OF EDUCATION

by

Wendy May Colyn

August, 1986

Project 1

A PERSONALISED LEARNING EXPERIENCE OF MATHEMATICS.

(INFINITY)

1. Introduction

Blake expresses some of my thoughts on infinity in these words: "If the doors of perception were cleansed everything would appear to man as infinite."

Choosing this topic was no easy task. I feel very inadequate as a mathematician and the complexity of the world of mathematics as experienced at university level left me feeling very anxious about this project. I thought of various possibilities such as mathematics used to predict ocean tides, mathematics in music and art and symmetry which all managed to make me feel even more threatened after having looked at some material on these topics.

I decided on infinity because I had taken the third and fourth year course with professor P. Human at the University of Stellenbosch during my B.Prim. Ed. years and we had done something about infinite series. I had always felt a bit annoyed at the fact that it was due to the horrible little formulae I had to learn and couldn't fully understand that I missed a distinction pass mark for mathematics. Now was the opportunity to prove to myself that I could "do" infinite series. Little did I realize where this learning experience would lead me.

I have made various discoveries about myself, about my learning processes and last but not least about mathematics.

2. Starting Out.

Having chosen infinity as a topic the search was on. I soon discovered that there weren't many books available on the topic which could mean something to me. There were plenty of books which would appeal to the sophisticated mathematician and this made me feel very inadequate. Just going to that dreadful place known on campus as the Immelman Library was enough to make me feel like a proper moron! All those super intelligent engineers and students giving me "looks" made me wonder what sacred laws I was contravening. Nevertheless, I managed to find some books that I thought I would be able to decipher.

In the diary that I kept about my learning processes I wrote the following: "my mind stands paralysed by the enormity of this task." It sounds like an exaggeration but feeling like this was no joke at the time because it immobilised me. Looking at the pages in the book, I found myself unable to read with understanding. My anxiety level was just too high to cope with all the little n's and -1's.

I did not know how or where to start. In desperation, I turned to a book which explained the images of infinity and eternity in English prose and poetry. Even in this field, where I feel relatively safe, I found myself unable to concentrate and make sense of what I was reading. I felt I needed some good advice on how to deal with anxiety before gaining advice on how to deal with infinity!

I started with a little paperback book that looked unthreatening and the title sounded friendly enough: Rethinking Mathematical Concepts, (Wheeler, 1981).

Someone at least had the idea that something had to be rethought. This book turned out to be misleading! I found that the author wanted the reader to become involved with complicated formulae and problems too quickly. A general explanation and introduction to the idea of infinity was lacking. "Never judge a book by its cover," lesson number one learnt very well.

I have learnt, or rather, relearnt that infinity can be represented by the sign ∞ . The fact that I felt that I had some knowledge that I would be able to record in a write-up made me feel safer than I had been feeling up to that point. The euphoria quickly dissipated when I encountered the next few pages which consisted of nothing but nasty little symbols. It didn't take much to persuade me that I should rather try another book. This was to form the pattern of my learning attempts during the weeks that followed. Some authors professed that their book was intended for the non-expert. I discovered that it would be best to avoid these books entirely. These people had no idea with whom they were dealing.

Although I was finding this a most traumatic experience I admit that infinity was starting to intrigue me. Zippin (1962) cites the example of a picture on a tin and there would be another picture in that picture and so on... This has always fascinated me. As a youngster I would stand and watch my mother baking. The baking powder tin had one of these pictures on it. I would try and imagine the tiniest picture possible. When voicing these fantasies I was told that I shouldn't be silly and do something constructive!

I was intrigued, too, by the paradoxes of Zeno. (Zippin, 1962). The paradoxes of the arrow and of Archilles and the tortoise were fascinating. At this stage of my investigations I really didn't understand their meanings but they went to the "back of my mind" and there they stayed to worry me every now and again.

What really amazed me was my capacity to work until all hours of the night and not feel tired. I found that while I was experiencing one of these highs (caused by nothing more sensational than work!) I would work and work until I literally dropped. I found that I would suddenly develop a vast amount of nervous energy that would last for a couple of days during which I wouldn't want to sleep or eat very much. Unfortunately these spells wouldn't last long and I would then find myself in a state of exhaustion and be a pain to everyone within close range. After being disheartened by Zippin's book I decided it was time to try something I thought I knew something about.

2.1 Starting infinite series

So (to my later dismay) I decided to try my hand at infinite series. I thought that it would be the ideal time to get even with an old enemy. Little did I realize that the old enemy hadn't forgiven me the past injustices it had suffered at my hands and remained totally uncooperative. The crunch came when I saw the following little formula:

$$S_n = \sum_{k=1}^n k^2$$

This would not be my last attempt at infinite series. I was desperate and made a special trip into town to one of the famed bookshops. Here I searched the shelves for a book that looked as if it would be of help.

Here I found one that promised to teach me simplified additional mathematics. (Murphy, 1981). It contained a chapter on the infinite series, feeling encouraged, I bought it.

This chapter made me aware of how number patterns interested me because they seemed pleasing to my mind's eye. I could relax and enjoy the given examples and not feel threatened by them. These patterns appealed to my vivid imagination. I've always pictured the n^{th} term lying out there somewhere in the black hole of eternity.

"An infinite sequence can be described as a sequence without end." (Murphy, 1981:126). I found this a dull and unimaginative description and preferred my own thoughts of black holes and eternity.

I disregarded the writer's lack of imagination and proceeded to do some sums - this was supposed to be a mathematics assignment, anyway. (see Appendix A). These "sums" proved to be thoroughly boring. I learnt about limits and terms and they did not prove to be very exciting at all.

At this stage I felt despondant. I was supposed to be of average intelligence yet simple things like sequences, limits, and terms were proving to be beyond my understanding.

What now? It was time to return to that dreaded place: the Immelman. This time, trying to appear very suave and assured of myself, I started going through the catalogue again. I came up with a variety of books. One of them (Rucker, 1982) would prove to be the turning point in my study of infinity.

Rucker (1982) had taken various aspects of infinity and written them down in words and not mathematical symbols and at last I was able to get past the first chapter of a book on infinity. The author explained the appropriateness of the symbol used to express infinity. Here at last was a mathematician who was not devoid of all imagination!

3. I become fascinated by Infinity.

Soon, I realised that man has considered the question of infinity for many centuries. I discovered as I read other books that there is an ongoing argument amongst mathematicians as to whether infinity exists or not. I was amazed to think that this isn't an argument that started today or even yesterday. It was debatable even in the days of Aristotle. (Some argument!)

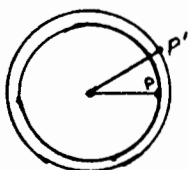
The Greek word for infinity is "apeiron" which literally means unbounded. It can also mean "indefinite" and "undefined." Apeiron was a negative, insulting word to use. Rucker (1982) states that a dirty crumpled hanky would be "apeiron."

Plato and Pythagorus excluded the entire concept of infinity from their universe. Plato believed that even in his ultimate form, the Good, must be finite and definite. (Rucker, 1982).

That mathematicians argued and debated amongst themselves just as ordinary folk do was a revelation to me. The fact that their arguments extended over many, many lifetimes and that the one tried to outsmart the other was a discovery worth making. It made mathematics appear so much more a human endeavour. I have had a fixed notion that mathematics wasn't all that lively but I would like to be able to convene a meeting. The V.I.P.'s would be Aristotles, Pythagorus, Plato, Cantor and Gattegno. There would be various others to liven up proceedings e.g. Newton and Einstein. Not that I think proceedings would need livening up!

Like it or not, infinity is here to stay. Gattegno (1984:20) says the following: "The wealth of contents of all mathematical creation is generated by its implied infinities. Something is only mathematical if it is shot through with infinity." John Mason (1984:28) says: "Every human being is concerned with issues of infinity because there are connections between permanence, absolute truth, relativity of opinion, and endlessness, immortality, mortality, and death." Profound words, indeed, but I do think that infinity and its study can largely be related to man's questioning of his mortality. Wheeler (1984:21) sounds as if he doesn't quite know which side to choose when he says that "infinity is of our minds and in our minds." According to Gattegno (1984) mathematics would only be mathematics if it is shot through with infinity and Rucker (1982) also states that the calculus would never have developed so quickly had it not been for those mathematicians who were willing to think in terms of infinity.

I would like to reflect from my diary about my learning experience: "After being so frustrated by not finding readable material I am grateful to Rucker for writing about these things as he does. The way in which he started his book brings about a feeling of mystery and magic. Other authors couldn't wait to introduce me to infinite series and the related formulae or to paradoxes. Rucker, by taking a different approach, has given me the idea that even I might manage to gain a little insight into infinity. He has managed to awake in me a sense of wonder. Something I didn't experience whilst trying to wade my way through the other books. The following problem managed to intrigue me. Does the larger circle have a larger infinity of points than the smaller? (Rucker, 1982:5)



(No, they correspond exactly to one-another).

I then went on to read about infinity and space and time. I started off by reading a little about it in Rucker's book and then I found an invaluable little book in the library of the Cape Education Department. While reading this little book (Ruch, 1958) I made another discovery. For the first time it occurred to me that mathematical formulae are "shorthand" for ideas that could have been written out in full sentences. I had the preconceived idea that these were set rules that could not be questioned. I exclaimed to myself: "What insight! What genius!" Which is how I felt when this realisation dawned on me.

The passage that brought about this realisation reads as: "Physicists do not explain or give reasons for the happening of a phenomena. They merely express in a clear and orderly way, and, if possible in mathematical formulas, which are used as shorthand expressions, a set of laws." (Ruch, 1958:5).

Soon, I was out of my depth again. This time even returning to Rucker's book didn't help. I encountered a dreadful challenge: I was suddenly introduced to a world of omegas and aleph - ones. On hindsight, I think this confounded me because I wasn't quite sure how these strange "numbers" were arrived at. To make matters worse I was challenged to climb omega plus omega cliffs in four hours. (Rucker, 1982:77). Was the man mad?

At this point I was once again feeling that I had been left behind. (On one of those infinite cliffs?) I sat down and tried to inspire myself. (see Appendix B). I pinned this up in front of my desk at home and hoped that it would somehow find entrance to my right brain. This shows just how desperate I had become.

It wasn't long after this that I decided to visit Mr C. de Jager whom I had met at Ken Dovey's lectures. A few words stuck in my mind after discussing my "infinite problem" with him: i.e. Cantor and set theory. The following day I spoke to a friend, Sue Brundritt, about the problem and she showed me a book called Infinite Numbers. (Cooper, 1974). I never looked back. Mr. Cooper knows how to write for the non-expert. I understand something of infinite numbers thanks to this book.

4. I discover infinite cardinal numbers:

Aleph-zero turned out to be an infinite cardinal number! It came as a relief to know what it meant. The next discovery I made was something I hadn't previously given much thought to. The subset of even numbers could have the same cardinal value as the set of real numbers, namely \aleph_0 . Cooper expresses it succinctly when he says: "... remember that until now you have counted finite collections only." (Cooper, 1974:8). So as long as the elements of a set can be listed (i.e. written as an infinite set) the set will have a cardinal number of \aleph_0 .

At this point I felt that writing about infinity and putting it all down in all the little symbols and numbers seemed to rob it of some of its mystical, magical qualities. It seemed to bind my mind to the pen and paper - much like after chasing a lovely, elusive butterfly you suddenly catch hold of it and, seeing it pinned down, you see that the magic that caught the wonder and lifted your soul has two wings, two feelers, and ugly little eyes. These thoughts came to me after reading some passages from a book on ontology. (Chihara, 1974).

The next part of Cooper's book dealt with the addition of infinite numbers. This part cleared my own concept of simple addition. (I really wonder what it is that we teach the children at school?) The following made me sit back and really think about addition: if addition were to work properly the two sets that are being added shouldn't have elements in common. (Cooper, 1974). e.g.

$$(a) \bullet \square + \triangle \circ$$

$$= \bullet \square \triangle \circ \rightarrow 4$$

$$(b) \bullet \square + \bullet \triangle$$

$$= \bullet \square \triangle \rightarrow$$

I wondered if (b) shouldn't be recorded as $2 \bullet \square \triangle \rightarrow 4$ instead of $\bullet \square \triangle \rightarrow 3$?

Cooper stressed the importance of adding the cardinal numbers of the sets and this gave me an important "clue" for work which was to follow. So it was easy for me to understand that $\aleph_0 + 1$ would be the same as \aleph_0 . I was then likewise shown that subtraction would be impossible for infinite cardinal numbers.

Cooper was trying to convince me that there is a bigger number than \aleph_0 but that addition is not powerful enough to break through \aleph_0 because even $\aleph_0 + \aleph_0 = \aleph_0$ (all the elements can be listed). It gave me a sense of pride to be able to rattle off these "dreadful" sounding terms and even understand them to a degree.

We tried to break through \aleph_0 toward a greater cardinal number by multiplying. Here Cooper explained the rule by saying that if we multiply two numbers the answer is equal to the number of pairs that can be formed from the two sets. (Cooper, 1974).

Here, I noted the following in my diary: "Once again I am astounded by the fact that someone makes up and discards rules while mathematising - because we couldn't subtract infinity it was simply discarded by Cooper. I was under the very definite impression that basic rules had to invariably apply to everything. Because we are able to multiply infinite cardinal numbers it could be accepted. But to be able to do this you have to know the very basic principles involved: i.e, those principles inherent to the nature of the basic operations otherwise one won't be able to know which rules you may discard because they don't work in certain cases."

Here I worked through the given arguments just to discover that even $\aleph_0 \times \aleph_0 = \aleph_0$. While going through these examples I found that my own taken-for-granted assumptions were not expressed on the paper in front of me. (sheer laziness, methinks!) Now, I know why it is so difficult to understand someone else's mathematising. It would be difficult to read a text where the author has omitted a key phrase or clause - no matter how easy the words were.

While doing the rather simplistic mathematics from Cooper's book I was drawn to other books I had on this subject, especially the one on ontology. (Chihara, 1973). But I found it to be too complex. This seemingly, simplistic work seemed to be vital to my learning process. Although I have also found that having tried to understand the more difficult concepts made this work appear easier. I wanted to prove to myself that I could master something of value.

This left a feeling of confidence within myself. I felt excited. I felt an "excitement" or "knot" at gut-level and experienced a reassurance of my capabilities. It was amazing, considering how I had felt when starting out. Just the previous day I had felt the old despair and panic while reading from the book on ontology.

I experienced these waves of self-assurance at irregular intervals all through this learning experience.

The next attempt to find a greater number than \aleph_0 included the use of power sets. I have noticed that set theory is largely used to explain infinite numbers. Cooper explained how to find how many subsets within a set. One has to find the value of 2^n where the set has n elements. For the first time since doing sets (since standard 5) someone has shown me how to determine the number of subsets. Not merely by giving a neat little formula but also by giving a logical explanation as to what is meant by it.

This is what I wrote as a comment next to the work I'd just completed on finding the little formula for the number of subsets: "This means that if $2^n = x$; x will equal the number of possible subsets, that is, the power set."

2^{N_0} is different to N_0 . At first I interpreted this as meaning $2 \times N_0$. I was thinking that if we have the set {1; 2; 3;...} then there will be twice as many subsets. I don't know why, but I saw it as {1; 2; 3; ...} \times {1; 2; 3; ...} and then pairing the 2 sets. But I think this amounts to finding the Cartesian product. So, at last we'd broken through to a bigger number: 2^{N_0} .

Cooper even went so far as to patiently explain how this all had been reasoned: all by the means of "reductio ad absurdum."

He gives a simplified version:

Hypothesis: I put the keys on the table.

Argument: The keys are not on the table.

The keys couldn't have moved.

Nobody touched them.

Therefore the hypothesis is false. (Cooper, 1974:18).

I was later to discover that this way of proving something was what many mathematicians objected to. I soon became aware of my lack of critical thought. As I read and followed certain arguments I would allow myself to accept them as is. This lack of critical thought troubled me greatly. I read or listen to arguments and I have to take my time in thinking them over. If, to my mind, they are lacking it will only occur to me after some time, usually at some impossible moment, when cooking the family supper or when walking along the beach. I then have to make a determined effort to remember my ideas or I scurry around looking for bits of paper to jot them down on. So, I came to the realisation that I do not have an agile mind, that operates brilliantly within split seconds. It was a humbling experience to come to the awareness that I am a slow thinker.

5. I don't understand internal and external elements:

The question of external and internal elements was to prove to be a most trying one. The explanation in the book (Cooper, 1974) set out the problem of internal and external elements. I felt that besides reading it I wanted to write it out word for word. I wondered why this was necessary. A note taken from the margin of my text at the time: "I had to read this passage about three times and then once more aloud." Unfortunately I couldn't make head or tail of it at this stage although I did try very hard to make sense of it. Understanding was only to come later.

While working through the difficult work on page 20 I wrote the following in my diary: "While learning I tend to get very excited. I seem to have "flashes" of seeing how a thing will turn out and become excited to the pit of my stomach. But the very next moment I become dismayed at the complexity of the situation and my thoughts are blocked by all the difficulties. These are not verbalised as such but seems to be an image of darkness, sombreness or just a sense that this is not as easy as it seems. This "blocking" is a stumbling block to my learning for while trying to work out the above argument:

- (1) I couldn't understand the written language used.
- (2) I realised that this would be the crux of my understanding and I realised that if I didn't understand this portion of the work I wouldn't be able to understand that which followed.
- (3) I would force myself to return again and again to the text. The more I read the less I understood and I would panic. I would force myself to reread it again and again I wouldn't understand and so a vicious circle arose.

I found that because I had been taking a long time to get through this reasoning I was easily distracted. I would imagine I was hungry and used this as an excuse to leave my work or I would persuade myself that I was in dire need of rest... anything, to get away! I would feel uneasy about my learning and by jumping up to do other things I could push the problem to the back of my mind.

Another thought came to mind, maybe it was the way the author had chosen to express himself that confused me. So, here I tried to work on my own.

$$* > 2^{\aleph_0} = \aleph_0$$

- pairing of subsets to elements must be possible.

e.g. $\{1\}; \{2\}; \{3,4,5\}; \{1,3\}; \{6\}; \{1,2\}; \{4\}$

2^{\aleph_0} cannot be equal to \aleph_0 .

Because the set of subsets consisting of all the single element subsets will pair off anyway and be equal to \aleph_0 . How do you accommodate the variety of combinations of the elements of the standard set?

$$\left\{ \begin{array}{l} \{1; 2; 3; 4; 5; \dots\} \\ \{1; 5\} \end{array} \right\} \text{ internal}$$

where 1 would be internal but would be external.

I have managed to free myself from the taken-for-granted assumption that the author of a book always has the best explanation. I have become acutely aware that writers are not superbeings or gods but ordinary folk with strengths and failures. This learning experience is really concretising this idea firmly.

6. Is 2^{\aleph_0} bigger than \aleph_0 ?

The next task was to prove that 2^{\aleph_0} is bigger than \aleph_0 . Again rules were set which defined the meaning of "bigger than." From the given rule one could say that $5 > 3$ because:

- (1) they are different
- (2) the set $\{1; 2; 3; 4; 5\}$ with cardinal number 5 has a subset $\{1; 2; 3\}$ with cardinal number 3. I put it into my own language as follows - the subset can be contained within the original or bigger set.

So, by using the rules as above I was led to prove that 2^{\aleph_0} was bigger than \aleph_0 . At this point I experienced elation at my sheer brilliance. I felt that I had understood that 2^{\aleph_0} was bigger than \aleph_0 before the long, complicated explanation that was used in the book. If I'd realised that the basic question was to prove that $2^{\aleph_0} > \aleph_0$ by using cardinal numbers and subsets I would have proved it without the confusing information in between. I do suppose my proof would have been wanting for a description of "bigger than."

In any case, the experience was positively heady. Affirmation of my capabilities can only have a good effect on this learning process. These little "wow" experiences reinforce my learning as a positive experience and when I experience the "blocked" feelings my mind returns to these "wow" experiences and I seem to gather strength from them.

I am becoming aware of how my pupils should be experiencing the learning process. Only by struggling with a problem and experiencing the WOW will they experience intrinsic motivation. By being "kind-hearted" and not wanting the children to struggle I have probably caused so much damage to their learning. Once again, I rejoice at the opportunity of doing this course and Chris Breen who set me to teach myself some mathematics. To start with, I had thought that it was an unfair task. It is, at last, starting to prove a most worthwhile exercise.

The next step was an introduction to the universe of cardinal numbers. (Cooper, 1974). I resent the fact the writer (teacher?) thinks that the proofs that he has given are so involved that one is forced to revise them. (- if I was to follow the instructions in the book).

Beyond \aleph_0 is 2^{\aleph_0} , which we denote by \aleph_1 . This was quite an exciting idea as I had a discussion with a friend the previous week. He had said that you couldn't have a number greater than \aleph_0 and I had said that it would be possible and his reply to this was, "Ag, no man!". I felt quite inferior and unsure of myself but stuck to my argument although I couldn't persuade him. Now, that I have a way of proving it I feel I have some sort of grasp on this reality and feel more sure of myself.

I felt unsure of myself when arguing with Tom because I felt that he is a better mathematician than I and that was why I was willing to back down on my argument.

Another insight I gained into myself while writing this project was the amount of negative feelings I have towards myself and my intellectual powers. I have always tried to put myself down wherever I could and I have realised that I'm going to have to work at it for I also realize that the more I "go on" about being silly, naive and stupid the more people are going to treat me like that. I experience some people as being downright patronising about it. I would hate to be conceited and I suppose I tend to overdo the "I don't know anything" routine. Remarks like: "This might be too involved for you but...", started me thinking about my behaviour. I resented this. I feel perfectly capable of deciding what is too involved for myself and then asking someone to help me.

Back to the sums: Beyond \aleph_1 lies 2^{\aleph_1} (\aleph_2) and by taking the previous lines of reasoning further we can list the cardinal numbers: - the finite and the infinite ones.

Cooper goes on to warn us not to close our minds at this point as he says that the infinite is more elusive than described above. I could accept this because many great mathematicians and philosophers have pondered this question and all the work put together over many years has produced the understanding that we have of infinite numbers. Previously, I would assume that some genius had come up with the answer within a day or two and feel completely inferior and "not clever enough" because mathematics could only be done by such geniuses.

I now realise that such statements - made within the context of a few words can be the result of many, many years of complicated thought processes by different people - arguments have been put forward by some and refuted by others and changes in the structure of the mathematics has appeared resulting from these arguments. In ten years time the image may be different because by then someone else could present another argument. So, gradually, it has dawned that mathematics is not the set, static subject I had experienced at school but something like child's plasticine - a child may shape something today and keep it for a while. When he/she discovers that there are other possibilities this shape will change but the plasticine stays the same.

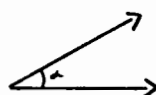
Before going on to find these bigger cardinal numbers it is justifiable to ask oneself: "but why?" Cooper answers this as follows: "Infinite cardinal numbers are a valuable tool in maths. When a mathematician is faced with complicated infinite sets that arise from his work he needs to know if they are identical." (Cooper, 1974:29).

Thinking about a mathematician wanting to know about his work I wonder what sort of doubts and fears he has - no teacher to say this is right or that is wrong. He has to be confident of his thought processes.

Working through Cooper's argument I came to an understanding of how he proved that if S is any set of cardinal numbers, there is a number bigger than all of them. (Cooper, 1974). I painstakingly worked my way through his explanations - mainly because I did not trust my own insight on first reading. This was how I thought of it: $S \subset n$ e.g. $586 = S$
 S has 586 elements whereas in n 586 only represents only one element while in S it will represent 586 elements.

Working through the explanation in the book I am proving to myself that I can trust the insights that I derive on first reading. I have an awareness or understanding and my mind tends to jump ahead of the explanation but because I've always forced myself to follow the given (or teacher's) explanation I tended to lose sight of my initial understanding. As a teacher this contains an important lesson: Let the child explain his work to himself and I as teacher, must withdraw from his personal learning experience.

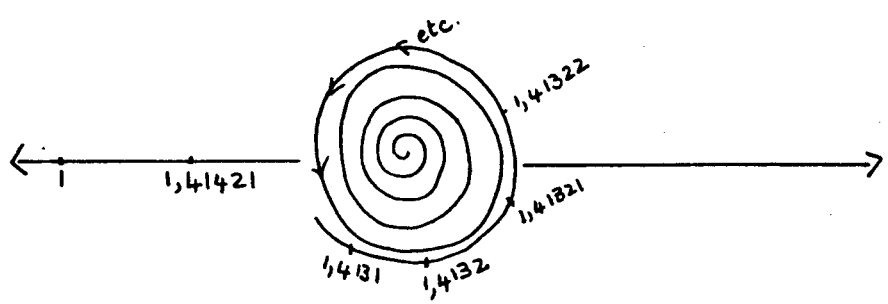
At this point I turned to another book. (Courant and Robbins, 1956). They share Gattegno's view that "the concept of infinity pervades all mathematics." I had, somehow erroneously, thought that the idea of infinity was a rather obscure branch of mathematics and that it was only studied by obscure people. Thinking back to school days I can still remember having constructed an angle:



and then wondering how far the lines extended and what part of the area between the two infinite lines was considered as part of the angle. Here was I, a 13 year old, and I was contemplating infinity which was promptly ignored by my teacher. I was put down with a terse: "measure the angle and write it down." This kind of experience certainly discouraged me from asking many more questions. Another valuable lesson for my future teaching practice: allow children to follow up on questions.

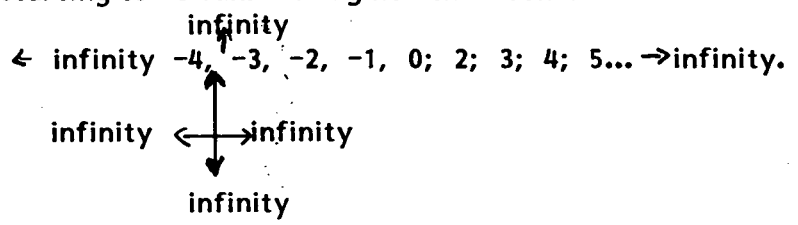
Back to the mathematics in Courant and Robbins. They warn me not to think of infinite numbers as a listing of infinite sets. Cantor made the important discovery that one cannot list all the real numbers i.e. rational and irrational numbers. This listing presents a higher type of infinity. (Courant and Robbins, 1956).

I didn't know what irrational numbers were, so paging through my matric text book I came across this fascinating idea: Just as with rational numbers, the set of irrational numbers is a dense set. It is always possible to find an irrational number between two given irrational numbers. I only now find this a fantastic idea and to think we "did" this in standard ten. I am able to form a lovely image which I would like to try and represent as:



Not much use mathematically, I suppose, but a lovely image to play with. I can just see all these complicated numbers spiralling up and down between any two given numbers. Lovely!

Here I would like to quote directly from Courant and Robbins (1956:81) "We start with the tentative assumption that all the real numbers have actually been denumerated in a sequence, and then we exhibit a number which does not occur in the assumed denumeration. This provides a contradiction, since the assumption was that all the real numbers were included in the denumeration and this assumption is false if even one number has been left out." Just note the language used! My being authentically involved with my own mathematics was starting to be fun: I imagined this scene:



What a complex picture of infinity and I love it! I created it! A little bit of my very own mathematics. I'm going to be very pompous and call it Colyn's diagram of infinity. Notice how, at this point, new words are creeping into the text as I

get more involved - "love," "like," etc.

I can hardly believe my own eyes. I once more find that beautiful diagram of mine is explained in dull words a little further on in the book. This is the second time that I've found my thoughts jump ahead of what is to come in the book and I feel my confidence growing. I am discovering that I can mathematise.

Now that I'm actually proving to myself that I can learn better on my own I am becoming convinced that teaching the Wheeler-way is going to be crucial in the future. This is no longer an idea that sounded good and logical but it is now a strong conviction. I can now teach from a strong conviction that if the child is not mathematising then the work hasn't presented itself properly to the child.

7. Conclusion:

I found writing about how I learnt fascinating. Awarenesses of my learning processes have previously been vague and unknown to me. I have unearthed a wealth of knowledge about my learning processes.

I have come to value a general introduction that borders on extreme simplicity in this process. I think it is because this gives one a general picture as to where some part fits into the whole. Courant and Robbins (1956) give a wide, historical introduction whereas most other books do not. These others tend to plunge in at the deep end and I find myself sinking before I can even attempt to understand the work. Once again, I will bear this in mind when teaching and when I have to choose material for children to use.

It is interesting to note that when I started I wasn't happy with the idea that my mathematics could consist of words and not little numbers and symbols. I wanted and expected it to consist of little numbers and complex formulae. What started off as a nightmarish journey ended as a rather gleeful trip through the wonder-filled world of mathematics.

And finally, from Lewis Carroll's Alice in Wonderland, I take the following words:

"I see nobody on the road," said Alice. "I only wish I had such eyes," remarked the King in a fretful tone. "To be able to see Nobody! And at that distance too! Why it's as much as I can do to see real people, by this light!"

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APPENDIX A (1)

$n = 1, 2, 3, 4, 5$ - (the n^{th} term $U_n = n$)

$$2^n = 2, 2^2, 2^3, 2^4 \dots$$

or

$2^n = 2, 4, 8, 16, \dots$ (the n^{th} term $U_n = (-1)^n$)

23rd term of the sequence

$$(-1)^n$$

$$n=23$$

$$U_{23} = (-1)^{23} = -1$$

23rd term of the sequence (n^2)

$$n=23$$

$$U_{23} = 23^2$$

Given: Write out the first 4 terms and find U_{10} in each of the following.

1. $\frac{1}{n}$ 1; 2; 3; 4; ... 10

$$U_1 = \frac{1}{1} = 1$$

$$U_2 = \frac{1}{2} = \frac{1}{2}$$

$$U_3 = \frac{1}{3} = \frac{1}{3}$$

$$U_4 = \frac{1}{4} = \frac{1}{4}$$

$$U_{10} = \frac{1}{10}$$

2. $2n$

$$U_1 = 2.1 = 2$$

$$U_2 = 2.2 = 4$$

$$U_3 = 2.3 = 6$$

$$U_4 = 2.4 = 8$$

$$U_{10} = 2.10 = 20$$

3. $2n + 1$

$$U_1 = 2.1 + 1 = 3$$

$$U_2 = 2.2 + 1 = 5$$

$$U_3 = 2.3 + 1 = 7$$

$$U_4 = 2.4 + 1 = 9$$

$$U_{10} = 2.10 + 1 = 21$$

Appendix A (2)

4. $2n - 1$

$$U_1 = 2 \cdot 1 - 1 =$$

$$U_2 = 2 \cdot 2 - 1 = 3$$

$$U_3 = 2 \cdot 3 - 1 = 5$$

$$U_4 = 2 \cdot 4 - 1 = 7$$

$$U_{10} = 2 \cdot 10 - 1 = 19$$

5. n^3

$$U_1 = 1^3 = 1$$

$$U_2 = 2^3 = 8$$

$$U_3 = 3^3 = 27$$

$$U_4 = 4^3 = 64$$

$$U_{10} = 10^3 = 1000$$

6. $(-1)^{n+1}$

$$U_1 = (1-1)^{1+1} = (-1)^2 = 1$$

$$U_2 = (1-1)^{2+1} = -1$$

$$U_3 = -1$$

$$U_4 = -1$$

$$U_{10} = -1$$

7. $U_1 = a + 1 - 1$

$$= a + 0$$

$$= a$$

$$U_2 = a + 2 - 1$$

$$= a + 1$$

$$U_3 = a + 3 - 1$$

$$= a + 2$$

$$U_4 = a + 3$$

$$U_{10} = a + 9$$

8. $a + (n-1)d$

$$U_1 = (a + 0)$$

$$U_2 = a + d$$

$$U_3 = a + 2d$$

$$U_4 = a + 3d$$

$$U_5 = a + 4d$$

Appendix A (3)

9. $U_1 = r^0 = 1$
 $U_2 = r^1$
 $U_3 = r^2$
 $U_4 = r^3$
 $U_{10} = r^9$

10. ar^{n-1}

$U_1 = ar^0 = a$
 $U_2 = ar$
 $U_3 = ar^2$
 $U_4 = ar^3$
 $U_{10} = ar^9$

11. 1; 3; 5; 7; 9; 11
-9; 11

$n+2$

$(2n) - 1$

APPENDIX B

Lets go MAD on Infinity

Let your mind go think of

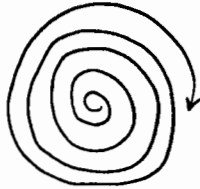
OUTSIDE  **EXTENSIONS**

DON'T go inside

or maybe your should
think of something **CREATIVE**

YOU CAN
+
YOU WILL

FIND BOOKS >
FIND PEOPLE >
PHONE RESOURCE CENTRES >
GO WILD! >



round like the circles
in a spiral
like a wheel within a wheel
Never ending or beginning
on an ever spinning wheel.

Project 2

TEACHING A SPECIFIC TOPIC : DIVISION

1. Introduction:

Many researchers and teachers of mathematics in schools encounter the teaching of the division algorithm as being the most difficult one to teach and for children to master. Various explanations have been put forward as to why this is the case.

Explanations ranging from the fact that division is the only left-handed algorithm to the methodology used when teaching the algorithm are given for the difficulty that children have when having to cope with division.

Researchers and writers of articles question the necessity of weighing the child down with this complex algorithm and they suggest that it might be more important that the child be made aware of when to divide and then allow him/her to rely on the use of a pocket calculator to reach answers.

It has been noted that even the children who are able to remember the steps in the algorithm and who are able to understand the implications of what they are doing need constant revision so that they may continue to complete the sums correctly. The question is raised by many researchers as to whether the time used for this revision couldn't be used more fruitfully to stimulate the mathematical growth of children. (see Appendix A).

2. What is Division?

There is a difference between the actual concept of division and the algorithm that must be used to reach an answer to a given problem. (e.g. $142 \div 2$). Findings suggest that there is a difference in cognitive demands on children when it comes to understanding the concept of division and understanding the process of the division algorithm. Understanding the concept may facilitate the understanding of the algorithm but being able to perform the algorithm would have little or no effect on the basic understanding of the concept. (Slesnick, 1982).

2.1 The Concept of Division:

Young children usually are well acquainted with the basic concept of division because they often have to share objects while playing.

Children as young as three-and-a-half years have a number-based notion of "sharing" and "fair" which is closely related to division. Young children understood sharing in the following terms:

- (1) portions that are shared are equal,
- (2) where some object (e.g. a crayon) is used but then returned to a communal base for others to use as well; and
- (3) taking equal turns using one particular item. (e.g. a tricycle).

These children also had a thorough idea of equality or "having the same." When asked how they knew sets to be equal all the children mentioned a numerical quantity. (A. Desforges and C. Desforges, 1980).

The young children (aged between $3\frac{1}{2}$ and $6\frac{1}{2}$ years) involved in the above mentioned research were quite capable of solving problems of sharing up to 30 amongst 2, 3 and 5 with and without remainders. Desforges and Desforges, (1980) say: "These findings contrast sharply with professional experience and professional literature." These children even devised a number of strategies of dealing with remainders. The children intuitively knew how and what to stress and ignore which as Gattegno (1971) points out is the power of abstraction and yet all the "professional experience and professional literature" chooses to ignore this powerful grasp young children have on their reality.

Desforges et al., (1980) found that the number of items to be shared played an important part when it came to number conservation. They point out that it is difficult to untangle the effect of conservation from that of age. It was apparant that older non-conservers tended to behave like older conservers on the tasks and findings were that conservation (as set out by Piaget) was not a necessary prerequisite for solving the problems they presented to the children.

Division can be described as being partitive (sharing) or quotative (grouping). Younger children seem to have a firm grasp of the former rather than the latter.

2.2 The Division Algorithm:

Children experience confusion when carrying out the steps necessary for the algorithm. Heidi says of the division algorithm: "It depends on the sum - sometimes you add and take away and sometimes you multiply." (Newman, 1985). It is also the only operation that is done almost entirely as a left-handed algorithm. Children in our schools usually learn the algorithms for addition, subtraction and multiplication (in that sequence) and these all work from the right to the left. The division algorithm is a reversal of this whole process. (Pearson, 1986).

Bates and Rousseau (1986) suggest that there is a difference between the division process and the division algorithm. According to them the division theorem can be stated as follows:

"...we may choose any whole number D (called the dividend) and any non-zero whole number d (called the divisor) then it will always be possible to obtain a unique whole number q (called the quotient) and a unique whole number r (called the remainder) that is less than d so that $D = dq + r$ and r are related as follows:

$$D = (q \times d) + r$$

Schoolchildren are expected to use some algorithm to produce a quotient or a quotient and a remainder when confronted with something like:

$$D \div d \quad \text{or} \quad \overline{d \overline{) D}}$$

Bates and Rousseau (1986) stress the fact that children should be introduced to as many ways as possible of solving the division problem as it may lead to many other areas of mathematics: e.g. number theory, GCD, LCF and HCF.

Children should not only be aware of the many possible ways of solving division problems but also the numerous ways in which division problems can be indicated. If one helps children develop "a rich set of meanings for division" it will help them choose and use the operation rationally from four basic operations when confronted with a problem situation. (Burton and Knifong, 1983).

The division algorithm is not easy to teach and Slesnick (1982) questions the wisdom of teaching it at a preformal level. (i.e. younger than approximately 14 years). The studies that were conducted showed that formal (older than 14) groups didn't perform better than preformal groups. It seems likely that without regular revision of the algorithm formal stage children would perform better than children at the pre-formal stage. Pre-formal children were more at risk of performing this algorithm by rote.

3. What difficulties are encountered by children when doing division sums?

- 3.1 Division involving zero seems to cause many problems. This appears to be true in all cases whether the division sum has zero as the dividend, the divisor or the quotient. (Grouws and Reys, 1975). This study found that children tend to over-generalise when confronted with a problem that had zero as a dividend. Children would state that the problem had no solution. These children had generalised that because division by zero does not result in a numerical answer then whenever zero is found in a division problem there is no answer.

Barr,(1983) found that omission of zero in answers was a serious mistake made by many children and his studies proved that unlike other mistakes or misunderstandings this one did not appear to improve as older children performed the task. $23 \overline{)4669}$ the correct response is 203 whereas he gives 23 as the most popular wrong response. He also remarks that very few of the children concerned in his studies chose to check their answer, even roughly, by using 20×20 and a large number of the people included in the study were content with an answer that suggests that 23×23 is 4669.

Jennifer did the following:

$$\begin{array}{r} 61 \\ 8 \overline{)4808} \end{array}$$

She systematically omitted the zero because she believed that "the zero doesn't count for anything." (Ginsberg, 1977:156)

Kent, (1978) found that some 14-year-olds were convinced that $1 \div 0 = 1$. One child put forward the argument that; "It is one divided by nothing. That means you have got one and you don't have to divide it so it's still one." He (Kent, 1978) found that it was common for children to think that $0 \div 0$ is either 0 or 1.

- 3.2 Another problem encountered by children seems to be that they just can't follow the reasoning that forms the basis of the traditional algorithm. Shuard and Rothery, (1984:41) cite the example of Luther (8) who started the process by writing the answer as he thought it should be:

$$\begin{array}{r} 44 \text{ r}2 \\ 2 \overline{)99} \end{array}$$

he then completed the sum so that it would have, what he perceived to be, the "correct shape.":

$$\begin{array}{r} 2 \overline{) 99} \\ \underline{90} \\ 9 \\ \underline{9} \\ 0 \end{array}$$

On questioning he explained what he had done as:

2 into 9 goes 4 remainder 1

2 into 9 goes 4 remainder 1 - so the remainder is 2 altogether.

Duffin (1978) found that this vertical way of recording the division algorithm as the basis to the problem of many children's difficulties. He found that although the children had difficulties in completing a sum like:

$$\begin{array}{r} 3 \overline{) 72} \\ \underline{6} \\ 12 \\ \underline{12} \\ \dots \end{array}$$

there was nothing wrong with their ability to distinguish between the sharing activity and establishing how many threes in twelve.

- 3.3 Reading the problem correctly or incorrectly seems to pose a real problem for many children. The order and arrangement of symbols is important. "For example, both the combinations of symbols $6 \div 2$ and $3 \overline{) 6}$ convey six divided by three, but the ordering of the symbols is opposite. It is not surprising that some children make the generalisation that in all division, the larger number must be divided by the smaller." (Shuard and Rothery, 1984:42).

Another child was found to interpret $\frac{6}{3}$ as $\frac{6}{3} = 3$.

He thought that this notation was merely another arrangement of $\frac{6}{3}$

- 3.4 Brown (in Hart(ed), 1981:37) says that although division is sometimes aided by the child's thinking in terms of "sharing" this can be a stumbling block to their understanding especially where the answer is not a whole number. Brown says that the problem was compounded when large numbers were used.
- 3.5 Brown found that children would readily identify $391 \div 23$ and $23 \div 391$ as being "the same". Only 30% of 12-year-olds recognised the non-commutativity of division. There was confusion when the terms "divided into" and "divided by" were used. Children tend to use them interchangeably along with "shared" between. The impression was that children felt that since given two whole numbers and a division operation, there could be no doubt about the answer, it did not matter too much about the order in which they were written.
- 3.6 Another common error committed by the majority of children was the idea that division always "made smaller." Freudenthal cited in Fischbein, *et al.*, (1985) criticizes the presentation of arithmetical division as related to only partitive and quotative division as this may easily mislead the child. Fischbein, *et al.*, (1985) argue against the introduction of further models as children in elementary school do not possess concepts and the reasoning

power to cope with models relating to velocity, area and volume.

Many of the problems encountered with long division and division in general seem to be related to language and the child having an opportunity of putting his learning into an "own language."

That these problems are serious, is not to be doubted and they should not be taken lightly. Kent, (1978) says "... these false interpretations create barriers which stop any real mathematical progress and lead to the frustrations, anxieties, hatred and fears which are central to the feelings many people have about mathematics."

4. What can I, as teacher, do about these problems in my classroom?

4.1 Listening and Analysing.

Researchers who were concerned with this problem agreed on one principle: it is vital that teachers concerned "listened" to the children doing mathematics Newman, (1985) says that it is vital to talk to children individually about the mistakes that they make. This will enable the teacher to have the necessary knowledge of each child's difficulties to help repair the damage that has been done and to encourage the children to use their own strengths instead of being dependant on the teacher.

Thus while teaching mathematics the teacher, must encourage the child to share his/her mathematising with him/her so that the teacher will see where lines of reasoning weren't applicable. I think it is necessary to stress that teachers mustn't go about looking or listening for wrong answers. All answers or solutions arrived at by children have been arrived at because of certain thought processes. It is our responsibility to uncover these thought processes and allow the child to become aware of them.

Asking questions like: "How do you know?" and "How can you be sure?" might lead the child to tell the teacher how he or she arrived at a certain solution. The teacher, must listen carefully and then re-direct thought processes so that some of the "damage" may be repaired.

Instead of a teacher merely marking an answer wrong or right, he/she should try and analyse the results. Teachers in the modern classroom are hard-pressed for time to engage in analysis and time must be made available for teachers to engage in this type of reflection. Teachers should not only analyse work done by children but also the comments that they make during the lesson. (Kent, 1978 and 1979).

Watson, (1980) analysed many errors by children who engaged in solving division problems. His findings recommend that it is important for teachers to hear how children do mathematics because this will provide a firm base for giving the child further help. Interviews with children are important as they may show that some children understand the concepts and make errors at later stages involving the computations:- as Slesnick, (1982) points out, correct computation and understanding of basic concepts are not necessarily interdependant.

The teacher must make time to analyse the mistakes that the children are making. While talking to children about their mathematising the teacher could record it on audio tape. This could then be listened to during quieter moments. The comments, as Kent, (1978 and 1979) says, could lead the teacher to new awarenesses as to how the children experience the class.

It is important therefore that teachers analyse written work, interviews with children about their ways of "doing" mathematics and comments made. This will give the teacher insights into why certain mistakes are being made.

4.2 Rewards:

It is common practice in our primary schools to use reward systems e.g. stars, stickers, favours, etc. These must be used carefully as the research of Schunk, (1983) has shown. His experiment with thirty-six children ranging from eight years and nine months to eleven years and five months showed that extrinsic rewards (small gifts/toys) promoted children's task accomplishments, percepts of efficacy and skill development. These children were motivated to work diligently once they had been promised a reward for correctly completing some division sums. When rewards are clearly tied to progress, children receive additional information on what they are capable of doing. Children seem to interpret teacher expectations as being higher and that the teacher perceives them capable of performing the given task. On the other hand Schunk's studies revealed that children who were rewarded merely for task completion did not fare as well as the group who were rewarded for progress. Schunk suggested that by rewarding only for engaging in and completing a task the children perceived teacher expectations as lower - that is: the teacher didn't expect them to be able to solve the problems correctly so he/she rewarded them for them having tried, at least.

It is important to notice that the "hidden message" conveyed to the children played an important part in their performance.

If the teacher is going to use a reward system it would be better to give rewards for correctly completed work according to Schunk's findings. But before the teacher grants rewards for anything that has been done he/she must consider the "hidden message" that is being conveyed to the child. A teacher will have to carefully think about the rewards and the purpose they are serving before using them.

4.3 Teaching certain strategies and the revision question.

Many valuable teaching hours are used for explaining certain strategies for problem solving. Teaching or explaining the division algorithm takes up many of these hours.

Lloyd, Saltzman and Kauffmann (1981) found that by teaching children specific strategies to "attack" (sic) division problems children would be able to have a strategy to solve other division problems. They used "trainers" to demonstrate a strategy. Four steps were used:

- (1) Firstly, the trainer taught them the meaning of the symbol: \div . The trainer would require three consecutive correct responses.

- (2) Secondly, the trainer would demonstrate how a division problem should be read. e.g. $49 \div 7 =$ would be read as, "Forty-nine divided by seven equals..." Again children had to make three correct responses.
- (3) The trainer then demonstrated the division technique to be used and then would lead the children through the required steps and praise them where necessary.
- (4) The children were then required to carry out the operation and were only praised if correct responses were reached.

At no stage were children required to verbalize the steps during training. After a brief training period children learned to solve division problems and the researchers claim that proficiency in solving problems was maintained a full week later!

The investigators claim that any groups of responses that can be reduced to a number of preskills and distinguishable strategies can lend themselves to specific step-by-step training. These findings accord very much with Gagne's theory of the learning of mathematics. Gagné suggests that to teach mathematics (division?) effectively one has to establish a hierarchy of capabilities that have to be learned and then present this set of capabilities to the learner once one has established or identified the capabilities already present in the learner. (Very much like programming a computer). The fact that the researchers tested the children only after one week will make many a teacher smile rather cynically.

If the teaching of an arithmetical algorithm was as simple as this investigation suggests it might be then I do not think that children would be experiencing the problems that other researchers (see section 3) have found.

It could be said that if a teacher expected children to be able to do the division algorithm mechanically for an exam, for instance, then the strategy suggested by Lloyd, et al. might be suitable. But as their research did not look at depth of understanding and insights gained by the children it is uncertain as to whether this strategy might be valuable to teachers. Most of the researchers, referred to already, stress the fact that they found children had to be exposed regularly to "training" when it came to using the division algorithm although the children understood what the concept of division involved. So, it seems to be important to us as teachers that if we are going to continue teaching an algorithmic based arithmetic that we are going to have to make plenty of time available to revise the steps necessary to complete the division algorithm.

4.4 Does pacing children's work help them cope better?

Studies have revealed that teachers tend to pace the work of the children in their class. This has been shown to be an important variable that influences student achievement. (Good, Grouws and Beckermann, 1978).

Pacing decisions by teachers were shown to be responses to cues that children supply in daily behaviour and performance. They report that student ability may unduly influence the expectations and behaviour of

classroom teachers. Good, et al., report the findings of Arlin And Westbury's study which found that students who paced their own work varied greatly as to the rate of progress. Students who worked in a teacher-paced group achieved at a lower level (on average) than those students who were allowed to determine their own pace.

Being consciously aware of this pacing tendency might free the children in our classes. Teachers will be able to be more aware as to when they are holding the more able children back or when they are progressing too quickly for less able groups - especially when introducing a new topic. When working with the division algorithm there will be those children who will understand it quickly and those who will struggle. It is important that we, as teachers, do not keep the more able child back while the less able ones are struggling to "keep up."

This awareness could also lead teachers to choose a more pupil-centred approach to teaching as this would give children the opportunity of working at their own pace. This will also mean that the teacher cannot teach in a mode where all the children are busy with the same exercise or problem at the same time, as still is the case in many of our senior primary standards in South Africa.

4.5 Provision of a wider variety of methods or strategies:

Exposure to a wider variety of material was also found to be an important variable when the researchers compared teachers whose students achieved at higher levels than those who did not. This underlines the fact that teachers should not only represent division as one set algorithm but demonstrate various methods to reach solutions to given problems.

Bates and Rousseau, (1986) have pointed out that if teachers open up various possibilities of solving division problems to children they could become involved in a wider range of mathematics. Division problems can thus be presented to children and teachers could present various ways of solving them. The children can then choose the strategy that they prefer. Given even this limited freedom might make their learning of the division algorithm a little easier and might encourage them to experiment with their own ways of solving the division problems they are given.

4.6 How can I make a child understand?

Teachers often wish they could help a child "understand" the division but Mathews, (1983) found that if children are not ready for certain ideas or concepts it is just about impossible for a teacher to "help the penny drop." She found that the results, in general, indicate that only for a minority of children is it possible to help them make important steps towards an understanding of written symbolism.

It is, therefore evident that if children are not ready for certain knowledge then no amount of patient explanation is going to bring them to understanding. Teachers will have to know the children in their classes well and will also have to provide stimulating problems so that children will want to find out ways of solving them.

Piaget's research findings have influenced the teaching of mathematics profoundly. His findings support the findings of Mathews, (1983). In South African schools we start teaching division in Sub-standard A.(i.e. between ages 5½-7). While in Sub. A. and Sub. B. children do only partitive and quotative division. Usually this is done concretely first and then abstractly. Children are not introduced to an algorithm at this stage.

During standard one children (of ± 8 or 9) are introduced to an algorithm for division. The wisdom of this is to be questioned. (Slesnick, 1982) Brown, (1981) also found that 10% of children at the end of the first year in secondary school had very little appreciation at all of division or multiplication - another 40% of children were not at all secure in their ideas of these algorithms.

Teachers are right when they question the necessity of teaching the division algorithm. Shouldn't teachers be engaged in making the children more aware of the concept of division and where and when this operation must be carried out?

Brown (1981) suggests that where calculators are readily available for computation the emphasis of our strategy must change from algorithm - learning to understanding of the structure of the operation of division itself and children must be able to understand how and when division should be applied. But before we relax and smile with gentle nods let us take heed of some further findings.

"In particular hardly any twelve-year-olds and under 10 per cent of fifteen-year-olds would consistently be able to press the buttons on their calculators in the correct order in solving simple division problems." (Brown, 1981)

If teachers paid heed to this advice we might spare many children those tortured hours of struggling through lengthy exercises designed to force them to memorise the steps of the division algorithms. Mathematical experiences that are permeated with such negative feelings will only result in a hatred of the subject. (Kent, 1978).

Is it not time that teachers pressed for more say as to when the division algorithm is taught, after all, aren't they more involved with the child in the classroom than the person who designs the syllabus? Hasn't the teaching of the division algorithm become a taken-for-granted reality? Research findings certainly support the idea that this reality must be seriously reconsidered.

4.7 The problem of zero and non-commutativity.

The evidence of research findings (as described in section three) suggests that teachers should be paying more attention to the concept of zero. Misunderstandings arise from the fact that many children seem to think of zero as meaning "nothing." (Ginsberg, 177). They do not see it as a place holder. Ginsberg suggests that teachers bring the child to the awareness of zero as an important feature of our mathematics. This can be done by making children aware of the difference between e.g. 11, 101, 110, 1001, etc.

The concept of zero is a difficult one especially when children are confronted with a problem like: $1+0$. So it is important that children become aware of the very special nature of zero.

Another stumbling block to children's understanding of the division algorithm is that children don't realize that division is non-commutative e.g. $6 \div 2 \neq 2 \div 6$. It is important for children to realize the difference in meaning when confronted with this kind of problem. Brown (in Hart (ed.), 1981) found that children would change $2 \div 6$ to $6 \div 2$ because it resulted in an answer consisting of a whole number. Teachers must make children aware of the fact that it is possible for the dividend to be greater than the divisor in a division sum.

4.8 Division and the early years.

The fact that how we teach division from the early years is vital to the child's further learning experience was proved in the studies undertaken by Fischbein et al. (1985): "The initial didactical models seem to become so deeply rooted in the learners mind that they continue to exert an unconscious control over mental behaviour even after the learner has acquired formal mathematical notions that are solid and concrete."

Copeland (1974) says that children at the operational level (± 7 years) are capable of reversibility of thought and that they are therefore ready to be taught multiplication and division as inverse operations and he strongly recommends that these two operations be taught simultaneously. However, this approach introduces division to children with problems like $6 \div 3$ and $8 \div 2$ for which the divisor is a multiple of the dividend. (Bates and Rousseau, 1986). And so, the idea of a possibility of there being a remainder is not apparent to start with. It is important that teachers use examples with remainders even at the introductory stages of division and discussion can evolve as to "what is to be done with the remainder" - when doing the inverse operation e.g. $9 \div 2 = 4 \text{ rem } 1$ but $4 \times 2 = 8$ - to reach 9 we need to add the one that was the remainder. Grouws and Reys (1975) found that it is a better idea to present the division number sentence first and then the multiplication number sentence.

4.9 Researching and improving ones own teaching of the division algorithm:

Teachers are capable of uncovering a wealth of information about the learning processes of the children in their classrooms. As researchers have pointed out it is necessary to keep oneself fully aware of the child's mathematising by listening and watching carefully. By using audio tape, diaries, field notes and, if possible, a VCR it will be possible to reflect on the way one teaches the division algorithm and how the children experience the learning of it. This information could then provide a valuable background for future lessons.

Leading educationists have recognised the potential of this type of research for some time already. Observation in one's own classroom can yield insights on a level with formal research hypothesis. (Kent, 1978 and 1979).

Kent stresses that mistakes made by children who are engaged in the learning process are in fact open invitations to "explore the universe of the learner." He considers the teacher to be in a "privileged position as far as front line action research is concerned." Teachers could build up a wealth of information by doing their own research which could be of benefit to all involved in mathematics education. "It may even be that we could bring some kind of discipline, form or theory to the very sensitive area of mathematics teaching."

5. **Conclusion:**

It is interesting to note that recommendations are on the increase for a moving away from old preconceived ideas of teaching mathematics i.e. lesson, exercises and drill techniques and the importance of language, discussion and practical work is gaining recognition. The Cockcroft report (1982:90) stresses the need of children to be encouraged to "discuss and explain the mathematics that they are doing." General discussion in the class must be encouraged. From this kind of discussion everyone in the class would benefit. Different points of view will increase the depth of understanding of all in the class. (Cockcroft, 1982:93).

And to end - a quote from paragraph 287 of the Cockcroft report:

"The primary mathematics curriculum should enrich children's aesthetic and linguistic experience, provide them with the means of exploring their environment and develop their powers of logical thought, in addition to equipping them with the numerical skills which will be a powerful tool for later work and study... However, we do not believe that mathematics in the primary school should be seen solely as a preparation for the next stage of education. The primary years ought also to be seen as worthwhile in themselves - a time during which doors are opened into a wide range of experience."

While teaching division are we opening doors or are we closing the doors to deeper understandings and awarenesses?

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APPENDIX A.

DEAR KATHY'S TEACHER

By James M. Moser

From: Arithmetic Teacher, Vol. 29 No. 8 Page 26
April 1982.

This is a true story. I do have a daughter named Kathy who is in sixth grade attending a local school here in my hometown of Madison. The school is using one of the recent textbook series that emphasizes the "basics." Kathy first learned division in fourth grade, spent a great deal of time last year in trying to master the skill of long division, and is at it again this year. The following letter to Kathy's teacher is essentially what I wrote a few evenings ago. After thinking about it a bit, I have added a bit to this more formal rendition. But basically it went something like this.

"Dear Kathy's Teacher:

I am writing to you because I would like to register a strong protest against the dittoed speed tests on basic-division facts that you sent home with Kathy today. At first, I was a good sport and counted the seconds it took her to complete the 100 problems. But I quickly became somewhat dismayed as I observed her increasingly nervous state and the rapid deterioration of her writing of the numerals. Her first trial took 3 minutes and 47 seconds, which translates into 227 seconds, or 2.27 seconds per fact. The next was timed at 3 minutes and 5 seconds, which works out to 185 seconds or 1.85 seconds per fact. Is this second trial really better than the first? Is either one truly different from the 'standard' of three minutes, which is 1.80 seconds per fact? Can you accurately measure the time difference between these really short periods of time - 2.27 seconds vs. 1.85 seconds vs. 1.80 seconds? And what difference does the time make unless you look at the number of correct answers?

"As you can see, there were three errors on the first trial. But I'm not really sure there were three errors. In order to get to your magical figure of one hundred facts, you had to repeat some of them to avoid putting any division-by-zero problems. One of Kathy's 'errors' was a repeat, and on the other rendition of that problem she got it correct. When I corrected her second trial, she also made three mistakes, but none of them was a repeat of an error made on the first trial. In fact, the only real change I noticed from the first trial to the second was that her handwriting became even more sloppy and hard to read.

"But, I'd like to raise a more fundamental question with you. Why are you working so hard on division facts? Where are they ever really used, except on timed tests like these which potentially may do as much harm as the good you hope to achieve? Where is the division fact in a problem such as $27 \overline{)531}$? Or where is it in such a simple problem as $7 \overline{)53}$? I would submit that the proper way to handle such a problem is to use trial quotients and then multiply each of them by seven. What Kathy needs to have at her fingertips (or tongue tip) is mastery of the sevens multiplication facts if she wants to do this problem quickly.

"I would be happy to talk this over with you at your convenience. Thank you.

Sincerely,
Kathy's father"

As a final thought, - something I did not communicate with Kathy's teacher, but now wish I had - is the wonderment about the place of division in mathematics instruction when we have hand-held calculators to do it more rapidly and more accurately. I, for one, feel it is more important to have Kathy know when to divide, rather than simply how to divide and not be able to apply that skill.

Project 3:

ATTEMPTING TO TEACH IN A WHEELER WAY

1. Introduction

I was teaching in the primary schools and although I had a passionate love of my work I realised that my classroom practice was not reflecting my beliefs. I realised that I had to do something about it but was not sure of what I should be doing.

While teaching I attended in-service training courses and usually came away feeling even more depressed and despondent as to what we as teachers were doing to the children in our classrooms.

I have an intense love and caring for children and a firm and committed belief in their abilities to think rationally, critically and creatively. But this was not being reflected in my classroom practice. I looked to others for support and encouragement and was, more often than not, shocked by their callousness. I am sure that this was a strategy that they had devised over the years to protect themselves from the hurt that comes from being involved in caring for others.

I desperately wanted to make school a nice place for the children and I to be. A place where children would be creatively busy: thinking and doing. A place where friendship, sharing, caring, love, warmth and respect could thrive. I'm afraid I failed dismally in my attempts. In the past I devised various strategies to hide these "unacceptable" ideas from people as they tended to set me apart. This made me more acceptable to those around me.

The problems I was experiencing in my practice at school seemed to be related to motivating the pupils and convincing them that the work was worthwhile. But I, too, was experiencing conflict as I felt that much of the work we were doing was just about useless to us as rational humans. The problem did not so much lie in the content as in the method of presentation. I had tried to conform to the work ethic for the sake of the normal day to day running of my classroom. I think that my attitudes came across very clearly to the children and they sensed my negativity.

I tried to be subversive to a degree by refusing to give homework but soon parents and colleagues wanted to know if I ever intended the children to learn anything. Didn't I know that the children would never learn if I did not give them homework? These reactions made me despair of even humanising my classroom.

The children were experiencing most of the work very negatively. Those who achieved well seemed to do so more because they wanted to please and impress me than for the sake of doing something that was worthwhile and interesting.

All my thoughts and beliefs had never been put into words so they remained just vague thoughts. This course has helped me get in touch with myself and it has enabled me to become aware of how I would like education to occur in my classroom: all the recommended reading and the discussion has enabled me to develop a vocabulary and convictions that have long been a dormant part of me.

Why is it important that I should be in touch with my own "philosophy of education"? My thoughts as to what education is and how it should come about will provide a theoretical backdrop against which I explain and justify my actions, make decisions and resolve my problems. (Carr, 1984). It will also determine how I relate to the children and their ways of thinking.

Thinking about the question of classroom practice in these terms made me realise that the more I'm in touch with how I feel about the educational process the more critically aware I'll be of the situation in the classroom. I will be able to problematise my reality and I should be able to answer more fully the question of whether my classroom practice is reflecting my beliefs.

Nowhere did I encounter education as the development of rational autonomy and intellectual freedom or as a "growing tall" experience as described by Kent and Hedger, (1980).

Others and myself by not having strong convictions fell into the trap by saying: "If you can't beat them, join them." So I went about my daily teaching life trying to fit the pupils with skills and attitudes that would enable them to succeed in our technicist society. I thought that by "sugaring the bitter pill" I would be humanising my teaching practice.

Kent and Hedger say that: "There comes a time when in a civilised world we must begin to work in an intuitive way and develop our individual confidence, our ability to make personal judgements and our beliefs in them once made." (1980:147). The opposite is happening in our classrooms.

My observations at Bellmore Primary School in Rylands Estate, Cape Town proved how children were being pressured into achieving. Failure at any given task was unacceptable and could never be experienced as a potential situation where authentic learning could occur. The children manifested all the symptoms of being under undue stress. These children and others in our schools experience mathematics as a subject only for the gifted elite of the school and generally have no confidence in themselves as mathematicians.

2. Humanising the teaching of mathematics:

Teaching in the Wheeler method is a way I, as teacher, can give the pupils power over their own learning. Wheeler emphasises that education is not filling the child with knowledge. This accords with what Paulo Freire says about a "banking system" of education. The banking concept of education is a concept that emphasizes that the teacher is in full control of the learning process - everything is controlled by the teacher.

The teacher knows everything and the children know nothing; it is a process where educator controls everything from discipline to content and the method of learning. (Freire, 1972:46). This type of education seeks merely to domesticate man and in thus doing it dehumanises him. The child as learner perceives everything as coming from the teacher and he realises that he is not in control of his own learning. "As children feel compelled to accept their teachers' interpretations and objectives they are likely to undervalue or even reject their own ideas where they do not conform to the teachers', thus losing their control over the activity. The task for them will then become merely one of finding out

what is in the teachers' mind and then acting accordingly." (Rowland, 1984:25).

Thus all the pupil's energy and time goes into mastering the hidden curriculum. Freire, Bowers, Postman and Weingartner and many others emphasise the need to humanise our education systems. We need to humanise our teaching practice by allowing the child to make a valued contribution to the lesson. The children must be seen as the "meaning makers". Children must experience themselves as capable, critical thinkers - thinkers who can demystify their social reality so that they won't be unconsciously controlled by it. (Postman and Weingartner, 1969).

We, the teachers must no longer be judgmental in the classroom. Saying this is good, that is bad; this is wrong, that is right. The child's attempt cannot be discounted or approved of with a nod or shake of our heads.

Our practice must be humanised through dialogue to encourage critique amongst the learners themselves. The pupils can decide amongst themselves what is work of good or inferior quality. They will learn different ways of thinking and arguing. They will experience their own work products as real, worthy of reflection and discussion. (Hull, 1984).

Wheeler's article (1971) on the role of the teacher points out how most teachers allow the focus in class to be themselves and that this gets in the way of the learning process. Rowland (1984) says that the children are more concerned with guessing what the teacher wants rather than working productively.

I, as teacher must withdraw, make my lessons pupil-centred where they are in control of their own learning, where they can discover that their minds are not "receptacles with a finite content easily filled, but a dynamic entity generating knowledge as well as other things." (Gattegno, 1985:36). I must allow the pupils to experience learning as a human activity that leads to insights and opportunities that will never cease.

Wheeler emphasises that to humanise our teaching practice we must not regard ourselves as "warm accepting therapists" but that we must approach our teaching with love and respect for the child but a love and respect that goes together with a fostering of insights and skills. (Wheeler, 1975).

Together with Kent and Hedger, Wheeler stresses the development of "insights" and "awarenesses", an intuitive way of knowing as a "human" way of teaching.

3. Reactions to "Wheelerising" and to being recorded on videotape.

So I was given the task of trying to teach in the Wheeler method i.e. making my lessons pupil-centred and task orientated. I, the teacher, had to withdraw and let the children experience their gaining of mathematics knowledge. I was taken by this idea. Although I will admit that the prospect of having someone coming into my class and recording the lesson on videotape was daunting. I liked the idea of discussing the lesson with the children although this turned out to be disappointing.

At Thornton Primary School, the first school I taught at it was interesting to note the reactions of staff members when I explained that I was to invite pupil criticism on viewing the videotaped material. These ranged from utter disbelief to

utterances of "you must be mad" and "oh, that's typical U.C.T. stuff." (The latter comment being made by an ex-U.C.T. student - interestingly enough!)

It is interesting to compare these reactions with those of the teachers at the second school I taught at, Bellmore Primary School. The teachers were more interested and asked me to use a break to explain what it was about. In the end we used a full hour discussing the project.

Looking back on the experience there are a number of positive things which emerged from the use of the video equipment. It allowed me to look more closely at myself in the classroom. I was able to observe myself, the children and our interaction. As Nixon (1981:9) says it serves "to sharpen perceptions, stimulate discussion and encourage questioning." Where things or certain reactions puzzled or worried me I was capable of going back and examining what I had done. For example, in the first lesson the pupils pointed out that my introduction had caused them to be confused. From the audio-tape I transcribed:

T : Could you listen to me as well as make sure you had all the sheets? Or were you more interested in getting your sheets at the time?

P : Getting the sheets..

T : And you weren't really listening or....

P : Half - half....

By watching myself on the video recording I could pin-point a lack of good organisation. This was something that had vaguely worried me for most of my teaching years. Now I was able to see what had bothered me.

Because of this ability to go back to the classroom as it actually was I was able to reflect on my practice. Using the video camera afforded me the opportunity to experience my classroom through the eyes of an observer, for a change.

I had the opportunity of seeing the taken - for - granted realities as an observer. I was no longer caught up in the situation as part of it and because I could now be separate I was freed to observe in a more independent way.

The video recording did have its drawbacks. The pupils and I had to overcome our awareness that we would shortly be viewing ourselves. As Dr. Hull stated in his lectures we are used to seeing "the others." Our world hardly ever constitutes the "seeing of ourselves" - my world is filled by the others of my existence whereas I form part of the others' world.

Unfortunately, the children also played up to the video camera as one can see in the last lesson on the tape. But the authors of A Room Full of Children Thinking (1985) assure us that the children will grow used to the cameras and other equipment.

The suspicion aroused by this activity in the school made me wonder if I wouldn't be labelled as deviant if I carried out this type of research in my normal classroom practice. Would I be able to sustain myself without a support group in a school? I think that support would have to be a very important component of research done in this way. Charles Hull, et al. (1985:99) also stress the need for a support group: "which can affirm the legitimacy of the activity and maintain the necessary quality of resiliency." Here I refer to day 3 of the diary I kept while on teaching practice. (Appendix A). The stress experienced when you realise that

something has gone wrong and there is no-one to discuss it with is most unsettling to say the least. I find the kind of remarks that I got from others like: "... but you 're so good with the children" and "you chose such nice work-sheets.." Irritating - especially when I know that something is wrong.

That is why research of this nature would have to be collaborative in nature. The people working with you must also be interested enough to be able to make truthful comments. As a teacher engaging in this kind of research I would choose the people I would be working with very carefully.

The drawbacks of using video-taped recordings as the basis for data gathering when doing research are not so great as to deter me from ever wanting to use this method. In fact I feel that using a video is very useful. I'm sure that if I was determined enough to improve my practice I would find ways and means of overcoming these drawbacks.

Using a video, audio tapes, diaries, etc. can only provide a sound basis for reflection on one's teaching practice and it makes such good sense that I wish I had been aware of this method of researching my own practice a long time ago.

4. The lessons.

After having studied the Wheeler article to see what was expected of me I tried discussing it with various people whom I thought could give helpful information from their perspectives.

Once again I was struck by the negative responses I illicited: and I hadn't even suggested that they teach this way. Having reread and summarised the article I thought that I had understood the reasoning behind it but I was hopelessly out of touch with the actual thought behind it. I realised that I would have to keep a low profile. But I wasn't aware to what extent I would have to try and withdraw. That is why you'll see me reading to pupils who are perfectly capable of reading. You'll see me interrupting and generally being a nuisance to the children and their task.

4.1 Lesson 1.

I taught the first lesson at Thornton Primary School in Cape Town. The children are in standard 4. They are a class of varying abilities. My chosen topic was squares and I had drawn up a worksheet for them to complete. Appendix B. (the numbers refer to the counter numbers I noted down while viewing the recording).

113 I gave them the indication to go ahead and I immediately interrupt them. I kept the class very teacher-centred as I kept on explaining what they had to do. 177.

177 T : I've included plain paper and lined paper (x2). I even doubt their ability to think what paper they would like to use. I'm very clearly giving the message that they can do as they like as long as it is in accordance with what I want them to do. 138

138 T : ... you'll see your task sheet says copy and complete. The children know full well that it is Teacher who says copy and complete. 144

144 T : Now you must copy these squares onto here. As I listen and transcribe I'm becoming more and more ashamed that I had the audacity to think that this was a pupil-centred lesson. This lesson was no more than

sugaring the bitter pill again - and a very thin coating of sugar at that!

170 T : Please start with this one first. What a democratic statement! Here I am supposedly making the child aware of his power(s) of learning and cognitive skill. I'm supposed to be giving them control and look at what I've just said. So in actual fact what I am telling the child is that he/she wouldn't even know where to start with this work so let the authority (teacher) tell you where to start.

200 T : Paul and Michael would you like to work together? I saw them moving and now I'm checking up on them. I've also made them acutely aware that I'm doing some checking up by voicing it. Hardly makes for academic freedom does it? You will notice that I haven't been able to withdraw from the teaching situation. I dominate the scene both physically and vocally: you just can't miss me. By this time I'm supposed to have focussed the children's attention on the problem but the whole class is still looking a bit worried and perplexed as to what to do.

213 There is serious consultation between Bianca, Wayne and Mark J. I wonder if they are asking one another what must be done - I wouldn't blame them for being totally confused. Wayne can't stand it any longer and up goes his hand. Unfortunately I couldn't hear his question but judging from the question I have asked him:

236 T : What do you think they want? He has asked me what he should be doing. He is unsure of himself. I have failed to give them a clear task and it has left him guessing. I tell him to read the question and then quickly
243 ask him "What do you think they want you to do?" I've given him no time to try and work it out on his own. He must be feeling very threatened by my question as I've asked it so loudly as for all the others to hear. He must be regretting ever having asked the question. (Quinton and Jeannine are staring at him and some of the others, too, I suppose). I have not succeeded in keeping our communications confidential and I'm definitely not helping him overcome his hesitations.

420 There is no interaction between the pupils and I think that they are very much aware of the fact that I'm in perfect control. I haven't managed to hand over their learning to them. They are probably doing the work because they have been told to do it - the captive audience.

470 I pace up and down and almost run to a child who asks a question. I'm conveying a silent message: I have all the answers, so don't bother to think - all you do here is raise your hand and I will give you all the answers.

At least I'm starting to realise some of the gross errors I make by watching this lesson. I have failed, in Wheeler, terms to involve the children in the complexities of their learning situation from the very beginning. I should have left the children to continue on their own.

Leslie was unsure of the square she had made and had asked me it.

535 T : Leslie, why isn't your square working quite as well as it should? Do you know how to get it right? Here again I'm given a hidden message that I know better, that she doesn't know much about squares anyway. What confidence can a child have when remarks like this are made?

838 T : Check to see you've done all your squares. I let my authority show - as I tell them in no uncertain terms that they have to do all the squares.

This lesson was never pupil-centered. It is obvious that I was nervous. The continual repetition and "stiff" awkward atmosphere is not my normal teaching style. I had planned and structured the lesson too tightly which allowed them very little freedom for their own learning. They felt they had to do everything on the sheet - this is borne out on the audio-tape as well. As I became more hurried the more I gave them in terms of the work.

823 The absolute joylessness of these children's situation came through very clearly here. It is written all over their faces. To be quite truthful I don't detect much facial expression at all. Little Leslie seems to sum up the whole idea of our education system in one look. I look very unfriendly, too. I hardly come across as a dynamic person who can let the children become human through worthwhile work. 826

771 T: Even Michael S. who usually has more bounce to his ounce is totally subdued. I've put the examples on the board - more teacher directedness. At this point I disregarded all attempts to "Wheelerise" and carried on in the normal teacher-directed way (this is an erroneous statement because I realise that the other teaching was also teacher-directed but at least there I was attempting to "Wheelerise")

1006 At last Michael had to say something. He probably would have burst otherwise. I'm sorry that I couldn't hear what he had to say. He is the one that usually uses "colourful" language!

1068 Here it can be clearly seen that I'm attempting something I've read about and don't have the faintest idea how to put into practice.

T: How do you know its alright? (I broadcast this in a loud voice so that everyone can hear).

T: Rosy, how do you know its alright? I should have gone closer to her and been more intimate and quiet about it. I can't resist it any longer and I try and coach her into an answer.

1094 T: You didn't cut one piece short, one piece long and another piece another length... All the lengths were the same.

Leslie was struggling to construct her square.

1160 Hands off, Colyn! See how I can't resist interfering in Leslie's work. I must avoid doing this at all costs. Near the end I tried to put some of the things that Wheeler mentions in his article like trying not to make judgements and trying to get them to say if an answer is right or wrong. So coming to the end of this lesson I feel that it was awkward and contrived and that we were all suffering from "video-shock." I see a very unnatural me and wooden-like children.

I've seen enough to convince myself that I could not hand over the learning experience to the children. I thought that writing my directions on the work sheet would avoid a teacher-centred approach but the whole lesson wasn't open-ended enough for them to have freedom within it. The work-sheet was inadequate, too. It kept the children well in control - they couldn't control it. There was no allowance for "growing tall" or changing attitudes or anything else. It was a normal mundane lesson.

From the audio tape I learnt some superficial things about my classroom practice but the pupils did not volunteer much without me literally dragging it from them. Nary a sign of genuine dialogue or critique. In normal practice I think one would have to wait for a trust relationship that would grow out of true dialogue before children would really start critiquing the teacher's work. The pupils will have to experience the teacher as a non-expert and a co-learner.

Nowhere in my lesson did I give them the opportunity of discussing their work and thinking processes with each other. It did however give me a few insights into their teacher's mode of thinking - she couldn't resist commenting and all her remarks about the children were derogatory.

During the following weeks and months I realised that to teach in the Wheeler way I would have to choose better tasks. Tasks that would be meaningful to the pupils. The tasks would be a way humanising my classroom practice. I also realised more of what lay behind the Wheeler way of teaching. Although, as you will see I still don't really know how to put it into practice effectively.

4.2 Teaching at Bellmore Primary in Rylands Estate.

My next teaching experience was to be at Bellmore Primary in Rylands Estate. Here I was allocated to the standard 3 classes and was invited to do as much teaching of mathematics as I wanted. I was told that the classes had not been streamed according to ability but I doubted this because while working with the class it became clear to me that the brighter children had been placed in the, so-called, 3b class.

My first lesson in which I attempted to teach in the Wheeler method was based on games. I chose games because I thought it would be a way of giving the children control over their work. It would force me to relinquish some control. (for the games that were used see Appendix C).

Unfortunately Sue, who was to be my "camera-person" forgot about our recording session and I only have the rather skimpy entries in my diary to go by. Here I learnt another valuable lesson. The diary entry (day 3, 24 April) is much too sketchy to be of much value. When doing research in my classroom without video equipment I will have to make field notes during class time. This might be a good idea because it will keep me busy and out of the children's way.

Recalling the discussions we had in the M.Ed. groups I am now able to pinpoint some more mistakes in this lesson. The idea of "games" during maths was new to them. I should have chosen only one. I could have chosen the calculator game and let them just play with the calculators for some time and maybe introduced the "game" the following week. I realise that once again I let a valuable learning experience slip us by. I console myself with the idea that I seem to be learning important lessons by making these gross mistakes.

I realise, too, that my taken-for-granted assumptions got in the way. Because my own children know and play with calculators regularly I had

assumed that this opportunity was open to all other children. I had also assumed that all children would be fascinated by the power of the calculator to "do sums" in much the same way as I am. Nothing could have been further from the truth. Some of the children were most disappointed because the thing couldn't play "Donkey Kong."

4.3 The second lesson at Bellmore Primary School:

The next lesson at Bellmore, was a similar worksheet to my lesson at Thornton. I had "adjusted" and rearranged it slightly. (See Appendix D). I did not give each child a copy of the instructions but chose to write these on the board. I asked them to read the instructions and then to carry on with the task.

1340 I can't believe it! I've actually managed to keep quiet during the whole process of writing on the board.

1396 None of the children are reading the instructions. This was to be major drawback in all of the lessons where the children had to read instructions.

I ruin a good start by saying:

1407 T : I want to go over all the things with you. I don't know what I should have done here. I felt that the children required some direction. This shows that I have not presented the task in a meaningful way to the children.

I will have to start paying closer attention to language usage. "I want" seems to be a major part of my vocabulary.

The children want to start and I continue talking:

1486 T : But on one page I want you to do everything. I prevent them from starting their work.

1516 I even decide that the child should use a pencil: to quote Shultz's Charlie Brown! "Good grief!"

1563 Zaid and another girl are wandering rather aimlessly about - one of the many ways of trying to beat the system? I can hardly believe my ears: I haven't heard my voice for quite a few seconds. Most important of all I do hear the children talking. I only wish I could hear more of what they are saying.

1572 A group hadn't started working yet and I wonder why the four girls haven't started with the task. There is a lot of restlessness in the class. I am becoming convinced that the task I set the groups must suit group activity.

I remember that I spent most of my time trying to locate pencils and rubbers for these children.

1650 Nermillah, the girl on the left of the screen is unable to start as she did not have a pencil. It took Sue to notice this. I should of made sure that all pupils had access to the basic materials that were needed then I would have had more time to spend with the pupils who needed some kind of intervention.

1740 Nermillah still hasn't been "absorbed" by the task. According to Wheeler I should have noticed this and helped her overcome her sense of hesitancy so that she could gain entry to the activity. I'm sure she is feeling very much left out of things. Looking at the class as a whole I wonder how they were experiencing the work.

1842 Shamie and Nermillah are still very unsure and I still haven't noticed it. Another opportunity has passed me by!

I may be taking the "withdrawing" a little too literally in this lesson but by comparison to the Thornton lesson I have much more control over my tongue! I attribute this to the practice I had by doing the B.Prim. Ed. three course with them and teaching in the Breen method: where you are told to teach a class knowing nothing and as a result you're too petrified to open your mouth so you quietly sneak out of the room at every possible opportunity. You soon realise that the students can do without your presence.

I must learn to be more observant of the groups and to approach those that look hesitant and then quietly listen to what is going on in them and then judge if they need intervention or not. For future research I must try and get a microphone that can be attached to the teacher. That way I will be able to hear all the verbal exchanges between the pupils and myself.

2005 T : Standard 3's remember to read number 3. I try to direct the childrens attention back to the basic instructions as I had noticed that they were doing all the examples. I had hoped that this would be a Wheeler way of re-directing their attentions. Asking a question, I hear some "catch" phrases and I say:

2222 T : That's a very good answer. I couldn't stop myself! So here I go giving my sign of approval to the child who answered about "angles", etc. I've just made the others in the class feel suitably inferior.

2225 T : What are the angles?

P Ma'am, the corners Ma'am. I should have encouraged more discussion here, as to the description of the angles - a whole idea and concept could have developed had I led them towards discussion.

In this general discussion I let quite a number of interesting comments just slip by. But I was only made aware of what to look for once my supervisor had judged my level of frustration and desperation high enough to warrant a "helping hand" in the form of viewing a small part of my last lesson, just before this write up. It really is a pity that I let these moments pass by because I could have allowed the children to see that all kinds of contributions are valuable within their learning context. I should have let them write up their ideas on the board and they could have discussed them.

I've detected a progress within the time that passed between lesson one and the second lesson - however slight it might be. I must still learn to get the children to respond and then work on the differences or conflict that arises from these differences. So much learning can take place in this "conflict" type situation. This would prove to the children that they are capable of making valued contributions and that they are all perfectly capable of mathematising.

The kind of work sheet that I provide for the children is still worrying me to a great extent. I feel that the work in this lesson was not experienced by the pupils as being very worthwhile or exciting.

4.4 The third lesson at Bellmore Primary

The third lesson at Bellmore: For this lesson I was asked by the mathematics teacher to present a lesson that would allow the children the opportunity of learning to draw a circle with string and a pencil. I then planned other activities besides just the drawing of circles. I was not the least bit impressed with this lesson and I still do not know what possessed me to do the worksheets that I did. (see Appendix E). Choosing so many activities was a mistake in itself. I concocted a "salad" of activities. To start with there was confusion as to who was doing what 2385 . As one can see on the recording the organisation of the introductory part of this lesson was a mammoth task.

During the lesson itself there was very little opportunity for open-endedness. Once again the work sheets and the task that I had set were heavily structured so I was in full control. I had fooled myself into believing that if I gave the children the work on paper I was making the lesson pupil-centred but in actual fact they had no or very little control over their learning experience.

- 2449 T: That's lovely: a very superficial and judgemental remark to make. This kind of language has no place in "Wheeler" teaching. I have not categorised my statement by saying what is good and against what criteria I have judged the answer. This raises another question: I wonder just how much superficial language like this I've used that hasn't been audible. One boy had tried to draw a circle with a compass and because it wasn't on my agenda that he do so.
- 2548 I was pointed to his mistakes and allowed him to see the error of his ways. In Wheeler terms I should have referred him back to the task.

When it came to drawing the circles with the string I did not allow the children to struggle along on their own and devise their own strategy. I interfered and tried to coax them into my way of doing it.

2583 and
2972

I could have centred my whole lesson around the drawing of circles and letting them find out their own ways of how to draw circles. I should have posed a problem e.g. I need to draw a circle. How many ways can you find to show me how to draw a circle? This kind of problem would have been better in that it would allow for the little boy who so badly wanted to use a compass. I had gone on to tell him that he had been crooking and that it was the "easy" way of doing circles: what kind of learning experience was this? I should have tried to make him aware that he was quite right in trying the easier way out. That would have reflected a more realistic view than what I did.

I am convinced, after this lesson, that the crucial aspect of my teaching is the way the content is presented to the pupils and not so much the content. I will have to put all my available time and energy into working out work sheets that would stimulate the children to active discussion by creating some kind of conflict and argument in the given task. In this lesson I could have achieved quite a lot if I had gone back to the basics of drawing circles and taken it from there as I'm quite sure that every child in the class would of had a different opinion on drawing circles.

4.5 The fourth lesson at Belmore Primary:

This lesson made me really think about myself and my adequacy as a teacher. After teaching it I felt depressed and despondent. I had given a lot of thought to the type of lesson it would be and also the type of worksheet it would entail. It was this lesson that I thought would get down to the whole business of humanising mathematics and also I had planned to teach and really try all the things I had tried to memorise from the Wheeler article. This last lesson I approached with the idea that this was to be it! How disappointing it turned out to be. I would like to refer to the second last entry in my teaching practice diary. (Day 15 Thursday 15 May). It clearly shows how I allowed my whole person to be involved in my teaching which is exactly what Wheeler warns us not to do.

For this lesson I've moved away from the previous modes of presentation. I was trying to teach all of the children all of the time. I had realised that my worksheets had not accomplished this. However I remained very unsure of myself and was trying to determine if I was right or wrong by taking this approach. At this stage I had not fully grasped the idea of pupil-centred activities. I was still confusing this idea with just keeping every child happily busy!

We had been discussing patterns and Lakayet was very busily drawing a very intricate design on the board when one of the others in the class passed a comment that made him erase all his hard work.

- 3069 P : That's not a pattern that's a design. Lakayet then proceeds to wipe off all his hard work which he was enjoying and of which he was most proud. I never saw the potential conflict in this moment of the lesson. I ignored it as I was not really involved with the pupils. I am beginning to get the idea that although I've always had the idea that I can "forget" myself with children that this is not the case. I am going to have to learn to become totally involved with them and their lines of reasoning so that I don't let things like this slip by again. In this part of the lesson I have withdrawn myself to the back of the class and thus was not really "with" them and because of this I had missed the crucial turning point of the lesson. Also I had not determined in precise terms the very nature of patterns. So I had no theory against which to test any hypothesis the children might of had. If I had been more aware, more in touch with the children and what they were doing I would have been able to highlight a "reality" that they had started to problematise. A whole new line of discussion could have been opened up by them - allowing them to explore all kinds of questions. This would have led to an open-ended activity where the children could have controlled how much they wanted to do and how far they wanted to go into the content.
- 3073 Because I've not allowed the children to develop the conflict situation Lakayet is very uncertain of his work and he starts looking around to see how to "fall in line" with the others. I have reinforced the hidden curriculum. I am forcing him to feel that he must be the same as the others and
- 3082 he looks around again to see that he knows how and what to copy. His resulting work will not be fresh or creative but merely a copy of the others' copies. He keeps refering back to the others.

- I should have taken more time in the discussion of this work and allowed a sense of critique to develop. The lesson was tightly controlled by me. Giving them the chalk certainly doesn't make for a pupil-centred lesson! I was in a hurry to do what I wanted to do. So I was not allowing the situation to develop and allow them to take it where they wanted it to be taken. I was eager to hurry the lesson along so that we could cover the work I had planned on doing. So I went to the board to let them know that I was now taking over and that it was time to move on to the next step in the lesson. This was not a good thing.
- 3107 By going to the board while others are still working I have caused a problem - there are too many points of focus. I should allow them to generate as many patterns as they feel necessary.
- 3124 I'm going to have to learn to handle the conflict situations so that they can develop into learning situations by using the Wheeler phrases like: "How do you know that? look at what you're/they've done; tell me what you know of, etc." My responses to their answers/questions will be crucial to how the situation develops. I must learn to encourage more questions from the children - without forcing the situation or making the situation contrived.
- 3150-3153 Here the children were thinking in terms of geometric forms to make patterns. I must devise a way that will encourage diverse reactions or at least reactions that will develop the idea that has been presented.
- 3162 T : Those of you who are sitting down , what would you use to make patterns with? In my attempt to get all the children involved I ask a rather pointless question. This strategy is not giving them the freedom to opt out if they want to. The whole tone of the question is insincere. I tried to force the issue but I should have rather allowed it to develop from their own remarks and questions.
- 3177 T : I wonder if we can make patterns with letters? Once again I try and direct them into something that they are not ready for. I should have allowed this to be part of a different lesson. I don't think the question was wrong but the timing was faulty. I feel I should devise another way of allowing this to develop. A cleverly phrased problem or statement is necessary to stimulate the children to generate all kinds of new ideas concerning patterns. I'm therefore looking for a "stimulus" that will set their minds free of their own preconceived ideas and prejudices. The way I set the task will be crucial to their experience of the work.
- 3256 Lakayet is continuing his "pattern" and is not concerned with us. At least I allowed him this opportunity to opt out.
- 3256 T : How do you know that? Aha! A Wheeler phrase at last. Some progression is detected but I haven't the necessary expertise to carry it through and let the conflict develop into something that will enrich the learning experience.
- 3300 T : A pattern with numbers, come on. I'm very aware that they haven't got what I wanted them to have. So I try and re-direct them to what I want: I am teacher-centred.
- 3306 Once again Lakayet is showing that he can make patterns with numbers. I missed this, too because I wasn't sure of what was at the basis of "number patterns" I wasn't at the deeper structure of patterns.
- 3353 T : This is also clever. Now I seem to have found a new phrase to replace "that's right" and "that's good." I must stop using these phrases that serve to set some children above others.

From 3362 I start giving examples. Once again my timing was bad. If this is what I wanted to come out of the lesson then I should have made it the core of my lesson. I must be aware of what I want to teach. If I want the pupils to experience mathematics as an open-ended situation where they can "grow tall" I must be sure to plan an open-ended lesson. These kinds of constraints that I have imposed all the way through this lesson must be avoided.

The worksheet that was provided (see Appendix F) didn't serve the purpose that I had chosen it for. The fault did not lie in the worksheet but rather in my lack of thought as to what actually lay behind the set task. I hadn't realised the rich potential of the work sheet. It could have been a good starting point and lesson in itself. I chose a worksheet without really understanding how it should be applied. It had to fit in with my preconceived ideas and this is why it failed to stimulate genuine and meaningful mathematics. I should have had a number of copies of the worksheet available and really let them battle with the problem and make as many "messes" as possible so that they could experience an "AHA!" reaction when they realised what it was about. (I learnt another very important lesson: make sure you as teacher read the problem and even try it out before starting it in a class - I only learnt late in the lesson that there is a BIG difference between dot squared paper and dot isometric paper).

5. Conclusion.

I now feel a lot better as many of the things that were bothering me have surfaced and have crystallised in the sense that I have been sensitised to possible situations that are crucial and work that must be presented sensitively so that it can create discussion and conflict. I need to develop the expertise that is necessary to handle these delicate situations - in other words I must learn to choreograph my mathematics lessons and not to teach them. Only when these conflicts arise in my classroom will I really be humanising the mathematics. True dialogue between all of us, as co-learners, can then arise.

I also realise that I'm going to have to make a determined effort to remain sensitive to these issues and I will have to learn from my errors in dealing with these sensitive situations. Sensitive, because once they have gone by unnoticed they are lost for good. I hope my learning will continue as I'm allowed to practice these skills and then reflect authentically on them.

"It is nothing short of a miracle that the modern methods of instruction have not yet entirely strangled holy curiosity of inquiry; for this delicate little plant; aside from this stimulation, stands mainly in need of freedom, without this it goes to wrack and ruin." (Albert Einstein)."

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APPENDIX A.

TEACHING PRACTISE DIARY

Day 1 - 22 April

Arrived at school. Met principal Mr. David. Discussion on how to combine students and classes and myself. Assigned students to separate classes. I will be responsible for mathematics (standard 3). Met standard 3b class. Had break at 10h00, stayed for tea and left.

Day 2 - 23 April

Arrived at school at about 8h10. Joined Teacher (Mrs Naidoo) in English Class (4A). Discussed my taking the standard 3's for maths period. My aim was to establish some kind of relationship with the class so that I could introduce myself and the idea of the videoing for tomorrow..

I entered the class (3b) at about 09h00. Was introduced to 22 very eager little faces. I suggested that "We" try something new - that they call me Wendy and not Ma'am or Miss or the usual "teacherish" words. - This caused quite a commotion and a lot of giggling but I suspect it will only take a day or two for them to get used to the idea - strangely enough I liked the sound of them calling me by my Christian name (quickly). I suggested we try this "new" thing up until Monday and then if they don't like the idea we can revert back to ma'am. I then introduced myself and stressing the fact that it would be the very first time that I have taught in an "Indian" school - I also asked them if they played and spoke to "white" children. Surprisingly some of them have "white" friends. I asked questions about their religions i.e. Hindu and Moslim. One little girl related quite a long story of a deity but the images and names were strange to me and I lost track of the story. They started by sitting at a "respectable" distance but eventually were virtually on top of me - one even on my lap! They were lovely, eager and exceptionally charming. I loved it!

The 3A were slightly more "stand-offish" and seemed less spontaneous but this may be due to the fact that to-day was the first day for us! They were more friendly and eager near the end of the period but I think tomorrow will be better.

One thing does worry me - the little table and chairs make a lot of noise while being moved or dragged about - together with excited chatter and squeals this makes for what could cautiously be considered as pandemonium - Oh well you can't win 'em all.

Their names are very difficult for my English/Afrikaans tongue to manage but they have promised to help me - and they are very kind about it.

I left the school at about 12h30 after talking to the teacher, Mrs. Naidoo.

Staff: Mrs Naidoo and I had an interesting conversation about the cultural - family differences between "Whites" and Indians and the structures of the families. During break we spoke about boycotts, casspirs and how they were handled last year. One teacher, Dawn had us in fits of laughter with her description of how, they as a group of female teachers, had to venture forth to the toilets which were surrounded by the soldiers! Amazing the humour that could be seen in this situation. It would appear that the staff are divided - "informers" being despised.

Day 3 - **24 April**

I had arranged to have my lesson video taped by Sue. Arrived at the faculty early in order to photostat worksheets. After the photostatting session which ate up about R8.80 I went in search of Sue and realized with a sinking feeling that she had forgotten about our "date." I hurriedly got a tape recorder from John and started to the school. On arriving there got to the classroom and got the children settled to some degree. I explained that we would be trying to play our games and that they should try and make out the rules for playing on their own and that they should try and help each other - for e.g. of the games see worksheets. The games failed to encourage the children to become absorbed in their work. The boys especially, just bubbled and bubbled and never really settled down to do anything. The only game that was enjoyed was the 9x game - which I considered easy enough for a standard 2 class and also it simply doesn't involve any real "thinking". In both standard 3 classes this was the most popular game. It would appear that the children would like to do a lot of these "easy" games. (Horrors!) I am still puzzled as to how the lesson went away? I tried to discuss it with Tom - no luck except the suggestion that I should let them introduce the games and allow them to choose the games that they would prefer. Trying to discuss it with Chris was even worse so it is back to the drawing board! I sensed that because the pupils were allowed to work in groups and because the material comprised of games it wasn't considered "work" my trying to introduce a non-authoritarian attitude didn't help matters either - all in all it was considered a type of break or holiday.

During Monday's lesson I am going to try and do what they would consider "work" but just sticking to group work as being "new".

(This part written before listening to the audio-tape).

I left the school feeling a trifle downhearted and pessimistic. I still feel as if to try and introduce "thinking" is going to be very difficult.

Audiotape:

I don't believe it
I don't believe this
Can I lend the calculator Ma'am
We not allowed
Shut up
126/126/its one twenty I'm telling you
No its one thirty
It can't be!
It can't be!
We'll never get through all these Ma'am
It's too hard
Help each other with the answers
Difficulty in using the calculators!

Day 4 - **28 April 1986**

Arrived at the school at 8h20.

Introduced new students to the Principal and Vice-principal. The principal will not be at school until Wednesday as he is attending a conference in Durban. The vice-principal assigned the students to the classes and we then spoke about tutoring.

Sue arrived at about 8h40 to set up video equipment. I of course had the wrong class number so we set up in the wrong class and then had to move over. This was easily done as the teacher who was busy was very accomodating and encouraging! The pupils remained quite stunned by the whole process. At the beginning of the lesson I gave directions and instructions and they all got off at a good pace. The main problem seemed to be a lack of pencils, rubbers and rulers. They actually worked away quite busily at the lesson.

The lesson content is worrying me as a very sharp B.Prim. Ed. student asked - What are you trying to teach here and I answered the usual things and once again it struck me as to "What am I actually doing?" Were these exercises really related to their world experiences and what development or growth could take place within the class. All these old issues came back! As for teaching Wheeler style I am getting used to the idea of letting them work at it and standing back but I still have to make determined effort to stop myself from interffering and over-directing.

The strict control has struck everyone - all the forms etc. and the fear of the inspector seems to be the main topic of conversation and this definitely filters through to the pupils. There is a marked difference of behaviour in my class where I am free of these constraints and the classes of the other teachers. It is really an "oppressed" atmosphere that one experiences. The strong competitive attitude also hits one full on and it would seem that the "clever" ones are the good ones that get somewhere.

Having the students in the school with me is also a good experience. I seem to be so more in touch with what is happening in the school and the general feel for the school. They are serving as a great source of information and it is an eye opener to see how they view teaching etc. I attended 2 of Mrs Naidoo's needlework classes and tried to help there. I ironed a few pieces of cloth. My help seemed to be appreciated. We left school at approximately 2.30. I have arranged to teach a video lesson next Monday and Mrs Naidoo will be taking her class tomorrow to review the tests.

Day 5 - 29 April 1986

Arrived at school at about 08h10. Attended Mrs Naidoo's maths class - Standard 3A. The class and their teacher were reviewing the monthly test papers that had been written last Friday. It has struck me that the "personal" relationship between children and teachers is very limited. It is a pity that they don't have just a little time together to just talk. The only communication that takes place is "subject" orientated. A lot of this communication is judgemental e.g. who had this sum right?; no?; yes? good! right etc. The teacher never uses any form of verbal abuse or any other way of "putting the children down" but the channels of communications are very limited. Many of the pupils are not really involved and they are very quiet and still. Emphasis is largely placed on achievement - failing being held as a bad thing to be avoided at all costs.

Sat and observed the lesson with 3B - and nearly fell asleep. Observation without a certain task in mind is just about useless one would imagine. But I suppose one gets to experience the class as many of the pupils do!

The question of school uniforms is an interesting one. Some wear tracksuits, some formal uniforms are worn - this does allow for a certain amount of free choice by the child.

I spoke to a teacher here who is a lovely creative interesting teacher and who would like to be doing extra creative things with the children but who is being pressurized into doing so much admin work that I wonder when he gets time to just "be". I am shocked and amazed at all the junk that they have to do. What are the powers trying to prove. How to wreck teachers in 6 easy steps" - would be an apt description. Anger rises when you think of how powerless and stupid the teachers' unions are to carry out the wishes of the teachers. This is a ridiculous system aimed at stopping anything creative and thoughtful coming out of the schooling and it would seem no one has the power to stop or change it. Even more amazing is the fact that the Heads of Departments, principals etc. allow their teachers to be handled in this inhumane way. It fairly boggles my mind. Yet these teachers can still smile and joke at break times. - I congratulate them for staying in this system for more than a month!

The children were to play soccer during their sport time but rain washed out play and children returned to classes instead - even the P.T. had to be called off - no school hall conveniently stacked with apparatus. Ha! again the unfairness of the system angers. What's all this talk about equal education. What is being done about it. I am becoming angrier by the ½ hour period in these school. I think of the system; all the talk at varsity and the bandying about of phrases and support but who is jumping in and actually doing something for these schools - I have yet to meet them. That's for now.. Helped Mrs Naidoo write marks into one of the infinite official documents (studying official documents in Indian affairs might somehow be related to my maths topic of Infinity). Also helped a pupil crochet "roses" onto a pair of bedsocks that she is knitting. Spoke to the students and we left at 2pm.

Day 6 - 30 April 1986

Arrived at the school at about 08h10. Worked in staffroom all morning on Social Construct of Reality . Sitting there gave me an interesting insight into the "school world" of the cleaning staff and how different their school routine is to that of the teacher. At break spoke to some of the teachers and students. Went to supervise. Lisé's lesson and was most impressed with her as a teacher. The children were excited and wanted to share ideas but the permanent teacher didn't want this. I feel terribly pessimistic and exasperated by my fellow man's acceptance of things, also by the size of the ed. problem. Adults being selfish, running childrens lives and not caring. I am decidedly down - must be getting flu or something. I will have to find a way of getting rid of this anger. As everything seems so useless. How and what can I do to better things - nothing, seems to be the only answer that pops into my head. Am I that incapable - all my belief in the very great potential of man and his abilities is shaken to the very roots. I will have to remain positive somehow - maybe tomorrow! I am despairing, disappointed and desperate and I feel very small and useless. Thank goodness these children smile so readily. It makes it a bit better. Chatted to Mrs Naidoo and arranged a lesson for Monday. - Geometry. Spoke at length to John. We were not asked to leave the room when the staff meeting took place and discussion arose centring on May Day. This was a good experience and I must remember to thank Mr David for allowing us to be in on the meeting.

Day 7 and 8 - (1 and 2 May)

May Day - University authorities have forbidden us to go to our schools and have called a meeting for the 2nd.

Day 9 - **5 May 1986**

Preparation: I have decided to plan activities, again rather than games. Now I will have to draw the focus of work to the humanizing of maths rather than making mathematics meaningful in a deeper sense. But will have to consider these issues to a deeper extent.

My idea to use the card of Robot Man didn't or couldn't work because I couldn't get hold of the right cubes. But we did the other activities. The circle drawing activity will have to be extended or something as it didn't generate much discussion and I think that this is something to aim for i.e. make basic activities or games where discussion will be encouraged but which also embraces the basic syllabus. Activities must encourage thinking and I'm afraid that my activities of today might not have realized this. The videotaping went well and the children enjoyed watching the playback - from next week I want to start questioning them and putting this on to audio tape. I have not been feeling in a very social mood and I think this is being reflected in my teaching and my conversation with the staff. I enjoyed the children as usual but found myself being "offish" with them - I think they could have felt this. They really seemed to like the weaving activity and displayed some of the loveliest use of colours. The draw a circle activity seemed a bit dull. Maybe they should be more involved in selecting what "round" objects they would like to use.

Mrs. Naidoo asked me to arrange a viewing session for the staff - I could maybe make quite a lot of this for my own learning experience. I should draw up a list of questions which could be topical to the video. I showed the children the photos that I took during the first lesson and they thought that it was good. I have left the photos up in the class for the parents to view this evening at parents' day/evening. The students seem to be getting into the swing of things and look like they are really enjoying themselves. I must arrange for the student in my class to do a criticism of my lesson, too.

Day 10 - **6 May 1986**

Arranged to teach Mrs Naidoo's class for this I took the number plate exercise and the children seemed to enjoy it, but once more I was struck by their inability to read with understanding. After this lesson I "critted" John's lesson and Helen's lesson. I was struck by the potential of their lessons and felt quite excited that they had tried to get the pupils to think. The pupils really seem to enjoy these different ways of teaching. Spoke to Mr David for about 2 hours. - very politically inclined but thoroughly enjoyed talking to him.

Arranged not to go with the school on their outing.

Day 11 - **7 May 1986**

(Wednesday). I arranged to go to Sivewe with Dan. Left U.C.T. at about 08h15 and got there at about 08h45. Was introduced to the teachers and vice principal Poppie. Sivewe is a primary school in Guguletu. Driving and getting lost there was an adventure in itself. Arriving at the school already set the scene. I was struck (if I can use such a neutral word to describe the disbelief and despair I felt) by the ugliness of the surroundings and the school buildings.

The principals office is ugly and bare of anything that resembles a little luxury (except maybe the telephone which is, red!) - the only bright bit of colour to be depicted in the whole of this "primary" school. My God I still can't believe the ugliness that surrounds these people!

The "staffroom" is a "hokkie" of about 3x3m that just about houses a table and a cupboard - 2 staffmembers would fill it to overflowing (and there are 19 members of staff). No arrangements can be made to serve tea or anything else to these "professionals". The anger that rises when I think of this!!!

Going into the classroom was another severe shock to my system now numbed a little, I think, because I couldn't take in all this ugliness. The floor has a couple of holes in it and a normal smartly dressed teacher would have trouble not falling over these holes and breaking her neck in the hurry of getting backwards and forwards. There were about 5 broken desks in the class, 2 window panes were broken. They have had to make use of wardrobes for cupboards. The standard 4 class that filed in were a mere 42 strong (not all pupils were present). They then proceeded to seat themselves in groups and Dan got on with the lesson using cuisenaire rods supplied by U.C.T. - only for the lesson. I spoke at length to Patricia, their class teacher. I asked her what enabled her to carry on day after day in this gross situation - not the salary at all, but her concern for the children kept her going. She has to teach all the subjects to her class of 48/52 marking all the work herself etc. She has no free periods to use for preparation etc. The strain must be incredible. The obedience of the class struck me and impressed me. I had expected a lot of resentment but experienced only friendliness and a plea to return. Oh how inadequate I felt on leaving - The question repeating in my mind 'What can I do to help?'

The walls of the classroom are in a terrible state, the plaster is coming off and the paint is aged and dull. There is absolutely no colour anywhere - the grass in the garden gives a little relief to the dullness.

Day 12 - 12 May 1986

Monday

I didn't do much this day as I was expecting to go with Dan to Guguletu today but he had not remembered and went ahead. I had cancelled my video lesson for the day, seeing that the school had organized an outing to the coke factory. I continued working in the staff room and later during the day I had a very good discussion with Mr David concerning action research as he is hoping to study at U.W.C. next year.

Day 13 - 13 May 1986

Tuesday

Went with Dan to Sivewe again today. It was cold. Saw three girls cleaning the classroom with "handless" brooms - why can't these people try and make things a little easier for themselves? one wonders. I wonder if everything that is done is seen as supporting the oppressors' system? I met the one inspector who was more than a little perturbed at my presence in the school. Dan used an open university idea for a lesson on fractions with C. rods and it seemed to go down well.

Even Patricia seemed a little more enthusiastic about teaching, I wonder what brought about the change in her? Calvin was there too, but seemed very little interested - he seems to want to just gather facts to stave statements and slogans for the BIG REVOLUTION. - I am probably being much too superficial and harsh in my criticism!! Am I starting to feel superior? Left the school after having a word with the principal. Dan and I are hoping to arrange to go back. I arrived back at Bellmore Primary and sat around doing nothing in particular.


Day 14 - 14 May, 1986

Wednesday

Again I didn't do much but sit and read in the staff room and talk to various members of staff. I also started planning for my video lesson for the next day. I wasn't able to teach much mathematics as the students had been asked to do a project with worksheets and therefore had to have the classes for this purpose.

Day 15 - 15 May, 1986

Thursday

I had chosen to do number patterns as a topic. My introduction introduced the idea of patterns - in ordinary teaching one could extend this to the art lesson this introduction had its merits but it should have been extended over a lesson or two. The activity chosen: smile  and the number patterns from the spiral or dotty paper. I don't know but something went wrong somewhere. I should introduce them into the concept of spiral and line, explain what counting the dots implied. The kids tried but failed miserably. I will have to watch the video carefully to see what was the mistake. Some ended up playing ball and all the time I had this sinking feeling of failure and despondance - nothing funny these days - getting quite used to it. My one big fault was not maintaining contact with the classes. Maybe if I had of done this I would have chosen better activities. This proves once more the vital relationship between teacher and pupil. I felt a great deal of disgust after teaching this lesson. I was even starting to doubt my own beliefs in the children and even "attacked" them by asking them why they didn't tell me they weren't enjoying the activity - How insensitive could I get - I hadn't taken the trouble to know them and here I was expecting to have gained their trust. So the disgust I felt should have been directed at no-one else but myself.

During break we had a play back to the teachers - Well what happened here just Still boggles my mind!!

I went to criticize two students and then finished for the day.

Day 16 - 16 May

Friday

Casting-off day. Criticized two lessons and a lot of superficial "highly charged" talk. We spent a long time just talking to the teachers - a good experience. Took leave of the school with much regret these are wonderful people who will not easily be forgotten.

APPENDIX B.

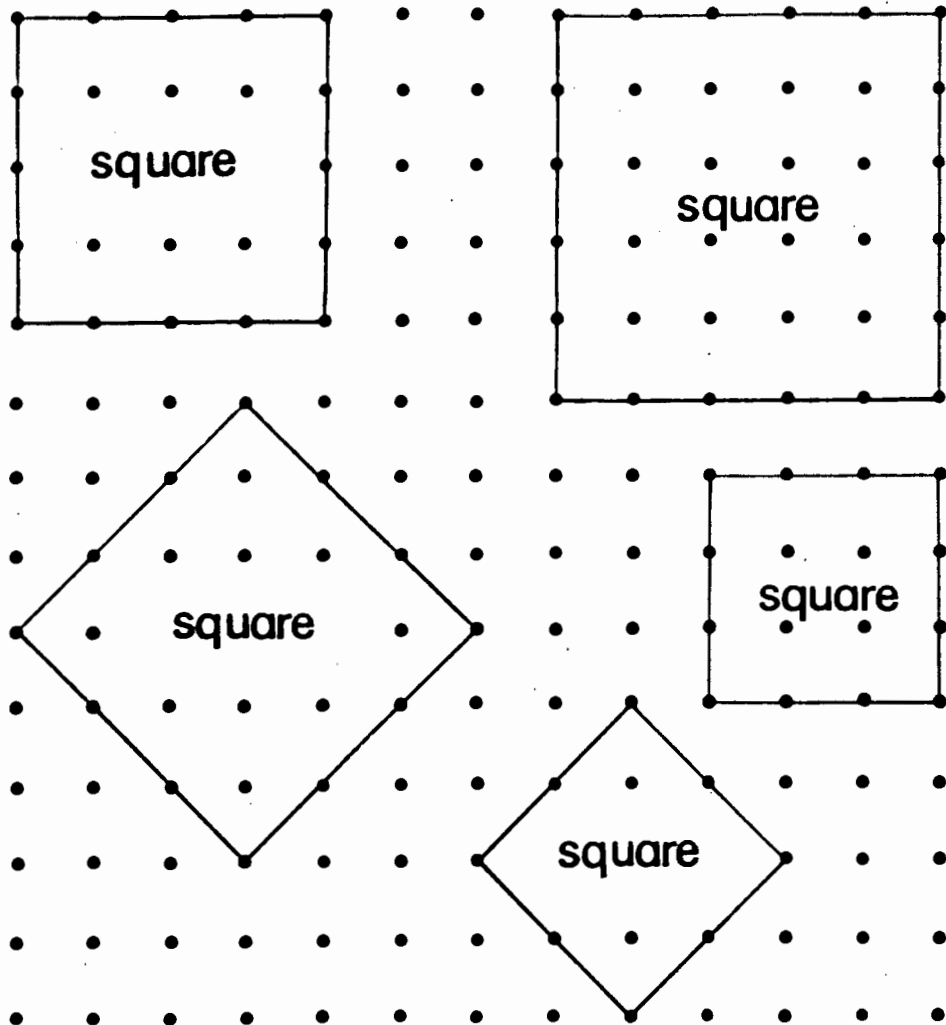
STANDARD 4 MATHEMATICS

14 FEBRUARY 1986

This task may be completed in groups of 2 or 3 or you may do it on your own.

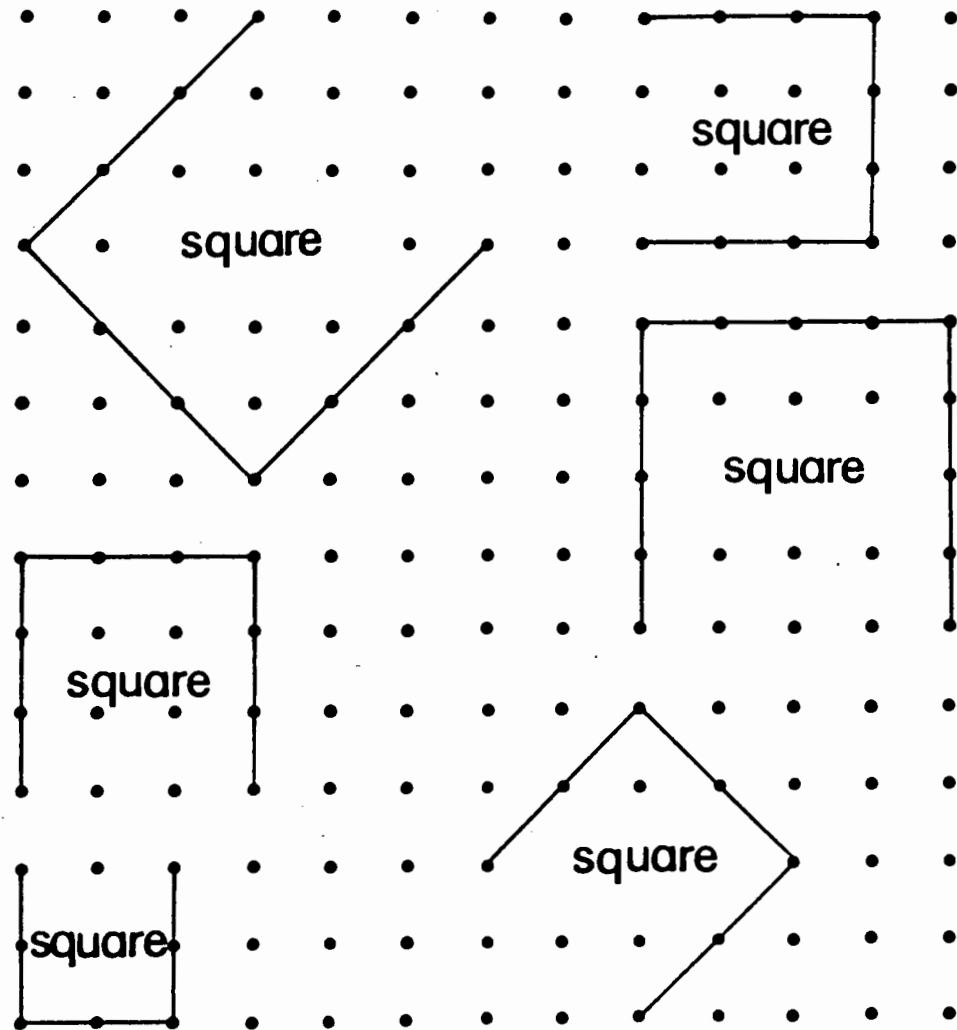
1. Complete the "question" on dotted paper. You will be drawing all kinds of SQUARES. Complete all the drawings before continuing.
2. On plain or dotted paper draw 2 different squares of your own.
3. Can you write some facts about squares?
4. Construct a square using paper and pins. If you feel like using something else to make the square you are welcome to come and talk about your ideas.
5. If you compare your square to an ordinary rectangle are there any differences or "sameness" that you notice. (see page 162 of the Mathematics text book for a rectangle).
6. What would your square look like if you drew it standing or balancing on one of its corners? What shape do you have now?

From: Maths takes off
G. Wroe.
Copy and complete



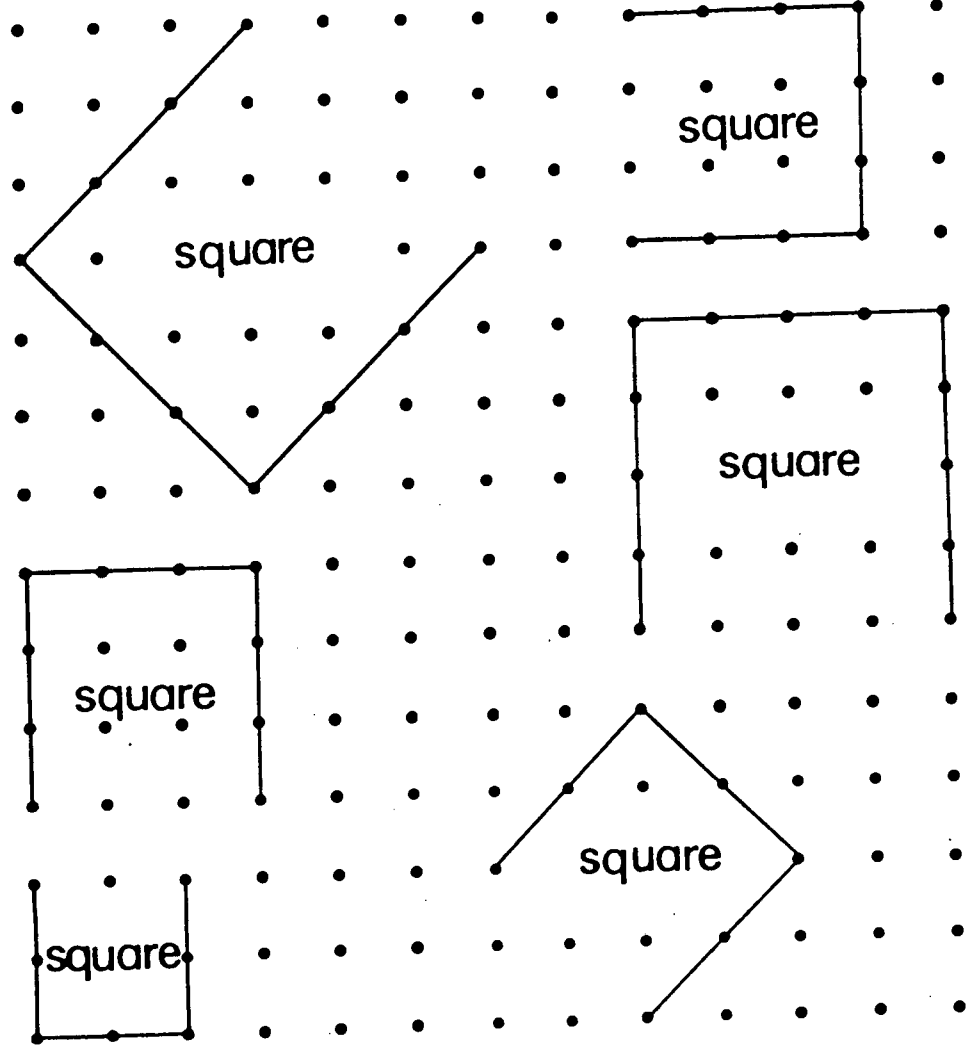
Here are 5 s _____

Copy and complete



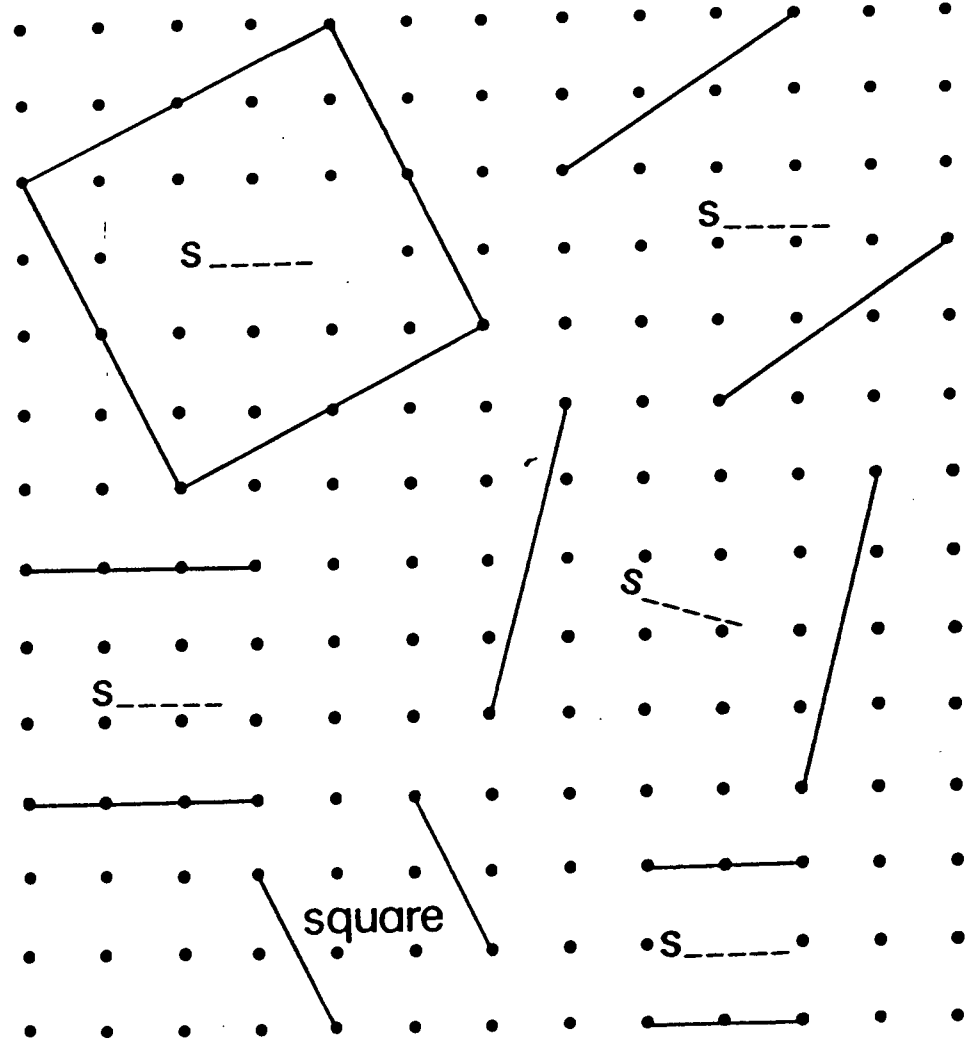
Here are 6s _____

Copy and complete



Here are 6s _____

Copy and complete



Here are _____

APPENDIX C
PLANNING FOR GAMES

GROUPS

5 Groups:

4 groups of 4

1 group of 6

Games: - 1 tables
1 calculator
1 Who's Last
1 Ideas
1 Producto

1 Brainy blocks

Set out tables and chairs - games at each centre
Groups to each table
Must try and work out how each game is played on own
Paper - few sheets on each desk.

Camera - follows progress of 1 group specifically and class in general

Tape Recorder - for discussion afterwards

At Department

Get 1 more calculator
Ask Sue for Tape Recorder/Monitor

PRODUCTO

Goals and Purposes

Practice on basic multiplication skills.

Materials

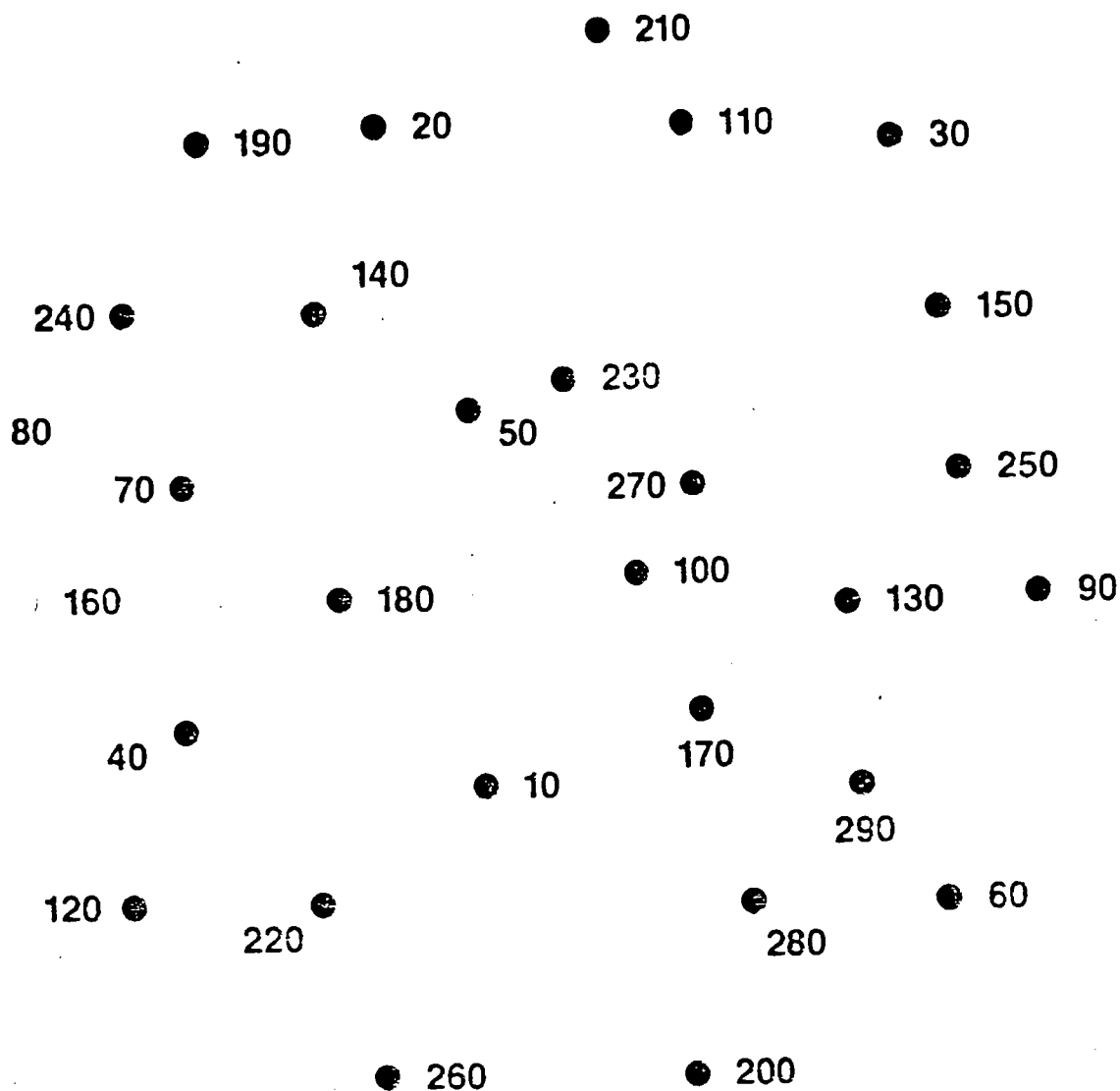
Playing board ruled into 36 squares and numbered from 1 through 36.
Cards numbered from 1 through 36 and 2 dice.

Procedure

All cards are dealt out to the players. First player throws the dice; multiplies the numbers that turn up. If he holds the card corresponding to this product, he plays it on the board. Play pauses in turn until one player has played all of his cards and is thus the winner.

Source

Material submitted by Halton Country Board of Education, Burlington, Ontario, Canada.



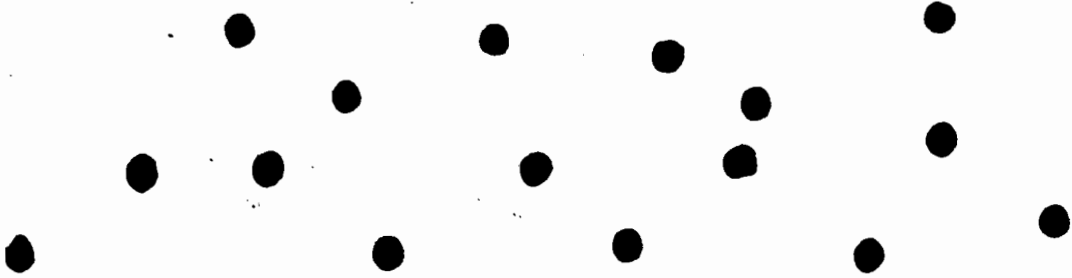
Directions:

- 1. Do each example.
- 2. Round off each answer to the nearest ten.
- 3. Mark each "rounded off" dot.
- 4. Connect the dots in order, using a straightedge.

- | | | |
|--------------------|---------------------|---------------------|
| 1. $12 \times 9 =$ | 7. $245 \div 7 =$ | 12. $536 \div 8 =$ |
| 2. $21 \times 6 =$ | 8. $34 \times 4 =$ | 13. $5 \times 47 =$ |
| 3. $472 \div 8 =$ | 9. $162 \div 9 =$ | 14. $3 \times 51 =$ |
| 4. $828 \div 3 =$ | 10. $13 \times 7 =$ | 15. $22 \times 9 =$ |
| 5. $446 \div 2 =$ | 11. $5 \times 51 =$ | 16. $628 \div 4 =$ |
| 6. $31 \times 4 =$ | | 17. $784 \div 7 =$ |

You will need: 26 counters

WHO'S LAST?



This is a game for 2 players.

Put 16 counters on the table.

At each turn you may remove 1 or 2 or 3 or 4 counters.

The player left with the last counter loses.

See if you can find a rule for winning.

Is it an advantage to go first or second?

When you have played it a few times this way, try it with 21 counters.

What about 26 counters?

CALCULATOR JOURNEY

Card 2 Puzzles

Enter 80 into your calculator.

Keep subtracting numbers until you reach 33. Record how many subtractions you had to make.

Could you get from 80 to 33 in fewer moves? Find out.

Now do the same for these numbers.

Remember to find the least number of subtractions you have to make.

57 to 29

122 to 79

412 to 270

35 to 17

164 to 68

550 to 380

64 to 26

136 to 53

648 to 220

93 to 45

217 to 160

674 to 146

72 to 35

283 to 95

402 to 125

105 to 58

305 to 118

311 to 199

CALCULATOR JOURNEY

Card 1 Puzzles

Enter 47 into your calculator.

Add on numbers until you reach 92. Record how many numbers you used.

Can you get from 47 to 92 by adding on fewer numbers?

Try it.

Do the same for these starting and finishing numbers.

Each time find the least number of additions you have to do.

38 to 63

67 to 183

94 to 317

16 to 54

41 to 130

186 to 324

27 to 85

75 to 142

141 to 439

45 to 72

33 to 101

217 to 440

51 to 91

86 to 203

196 to 512

86 to 155

59 to 248

309 to 575

The Secret of Nines

When you multiply a single digit number by 9, the two digits of your answer will always add up to 9.

		$9 \times 4 = 36$		$9 \times 8 = 72$					
		$3 + 6 = 9$		$7 + 2 = 9$					
9×0	9×1	9×2	9×3	9×4	9×5	9×6	9×7	9×8	9×9
0	9	18	27	36	45	54	63	72	81



Multiply.

1. $\begin{array}{r} 2 \\ \times 9 \end{array}$ $\begin{array}{r} 9 \\ \times 8 \end{array}$ $\begin{array}{r} 1 \\ \times 9 \end{array}$ $\begin{array}{r} 9 \\ \times 7 \end{array}$ $\begin{array}{r} 9 \\ \times 6 \end{array}$ $\begin{array}{r} 3 \\ \times 9 \end{array}$ $\begin{array}{r} 9 \\ \times 5 \end{array}$ $\begin{array}{r} 9 \\ \times 0 \end{array}$ $\begin{array}{r} 4 \\ \times 9 \end{array}$ $\begin{array}{r} 9 \\ \times 9 \end{array}$

Multiply. Write the letter that is next to each answer in the correct box below. Read the secret message.

$\begin{array}{r} 9 \\ \times 2 \end{array}$	$\begin{array}{r} 4 \\ \times 9 \end{array}$	$\begin{array}{r} 3 \\ \times 4 \end{array}$	$\begin{array}{r} 9 \\ \times 7 \end{array}$	$\begin{array}{r} 5 \\ \times 2 \end{array}$
A <input type="text"/>	E <input type="text"/>	H <input type="text"/>	O <input type="text"/>	R <input type="text"/>

$\begin{array}{r} 9 \\ \times 8 \end{array}$	$\begin{array}{r} 5 \\ \times 9 \end{array}$	$\begin{array}{r} 9 \\ \times 9 \end{array}$	$\begin{array}{r} 9 \\ \times 3 \end{array}$	$\begin{array}{r} 6 \\ \times 9 \end{array}$
S <input type="text"/>	T <input type="text"/>	U <input type="text"/>	W <input type="text"/>	Y <input type="text"/>

27	63	27

45	12	18	45

72	81	10	36

27	18	72

36	18	72	54

!

APPENDIX D.

Standard 3 - Lesson on Rectangles/Squares Squares and rectangles

Why do we need to know about Squares and rectangles

- * Stress need to help each other
- * Individual work sheets but all the same
- * They may do all the shapes or as many as they feel like drawing
- * Rather too little than too much
- * Stress need to copy as is on paper.

Compare the rectangles and squares

What is the same

What makes them different

Can they draw an "own" square and
an "own" rectangle.

Copy:

Another 10 of page 2 and 3 (rectangle)

Page 5 and 6 enough

Another 22 of page 2 and 3 (geometry

Provide dotty paper about 88 sheets

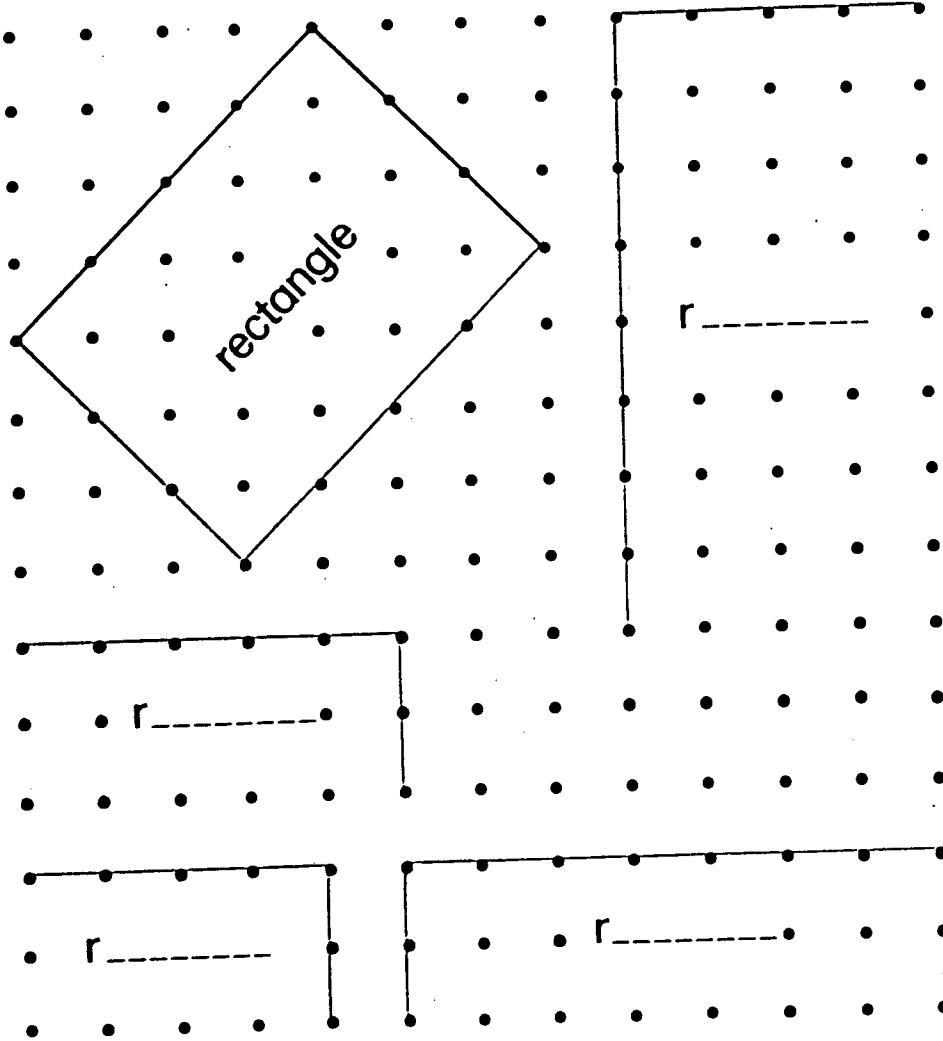
Step 1:

1. Allow them to move tables as they want
2. Write directions on board
3. Introduction
4. Practical work

Directions for board: **Work is done on dotty paper**

1. Complete the pages as they appear
2. You do not have to draw all the shapes. Do as many as you want.
3. Help each other
4. Copy as they are on the papers and complete the shapes where lines have been left out.
5. Be sure to try page 3
6. Can you do the following:
 - (a) Look at squares and rectangles
 - (i) What looks the same?
 - (ii) What looks different?
 - (iii) Draw your own square
 - (iv) Draw your own rectangle

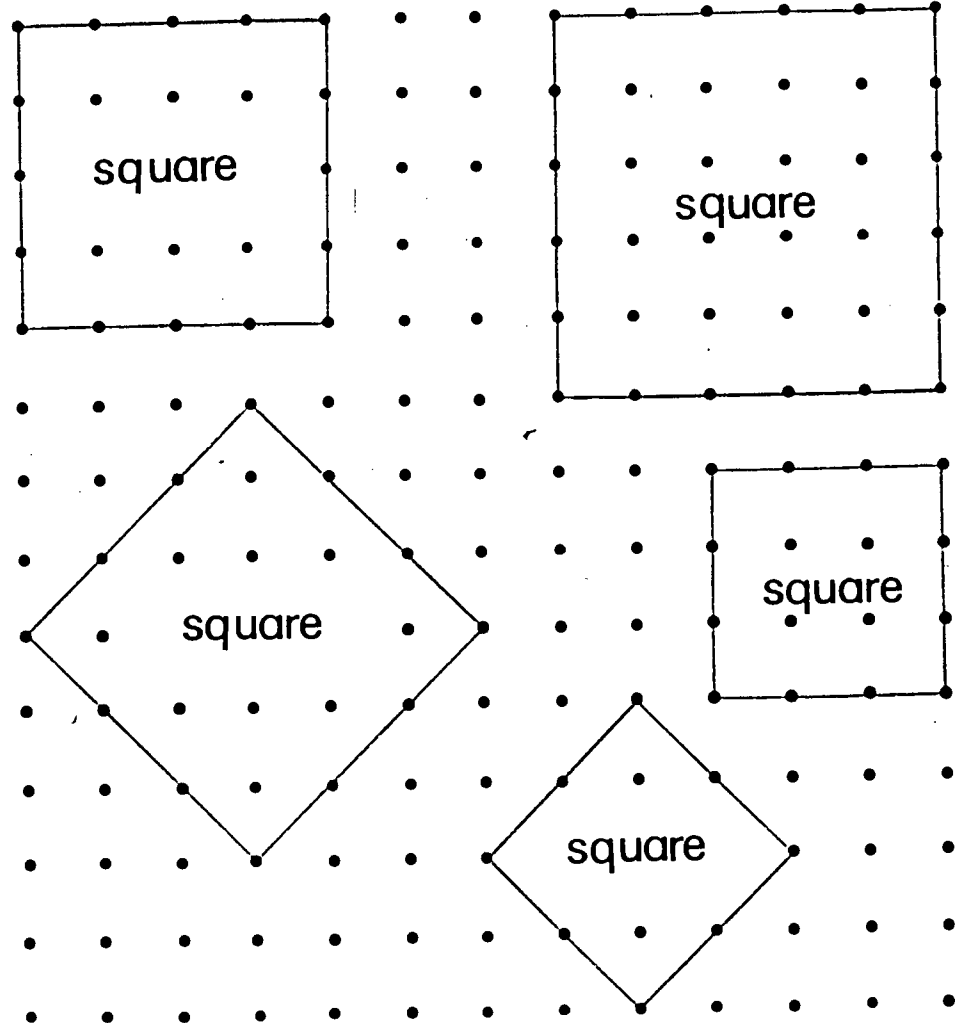
Copy and complete



Here are 5 _____

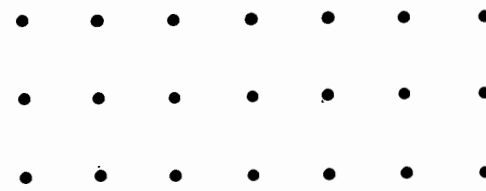
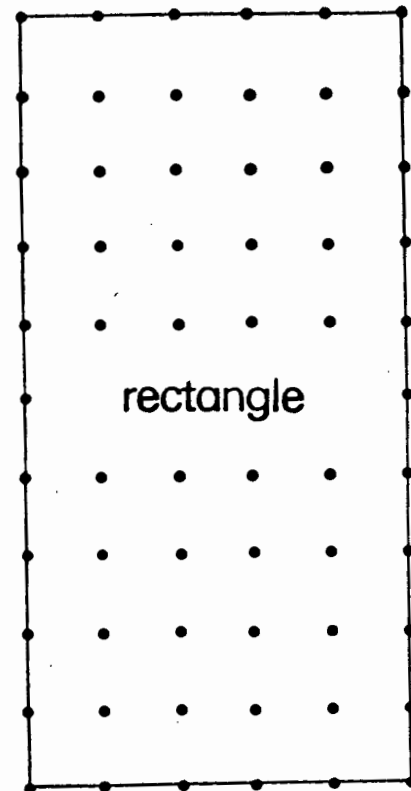
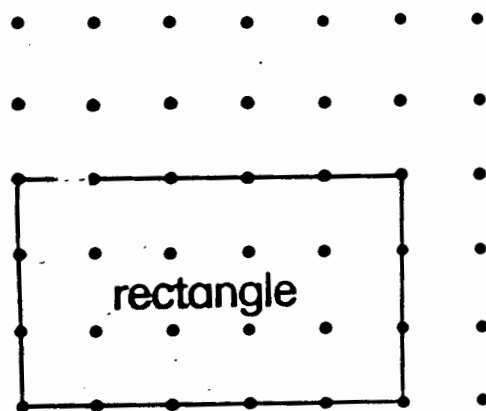
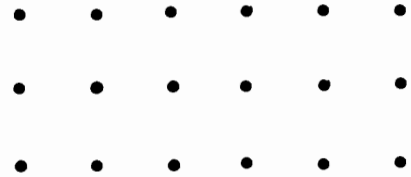


Copy and complete



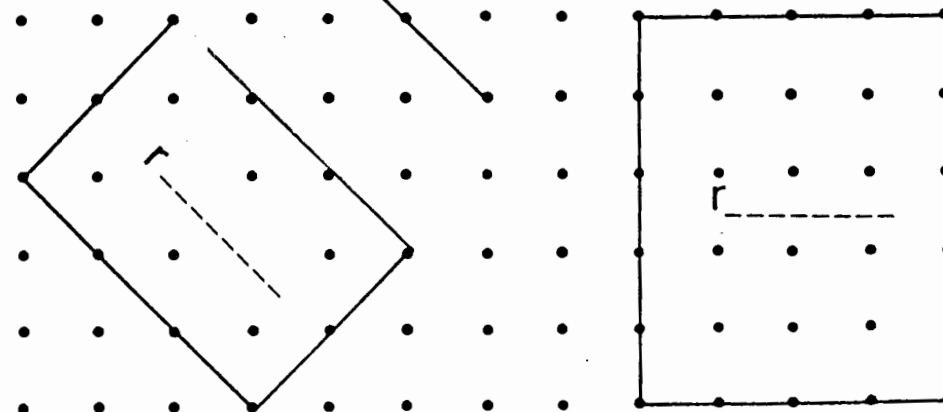
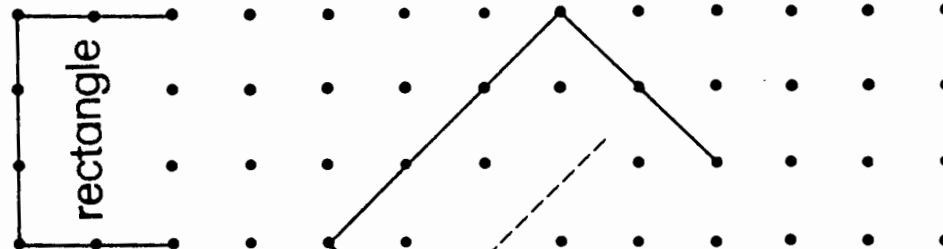
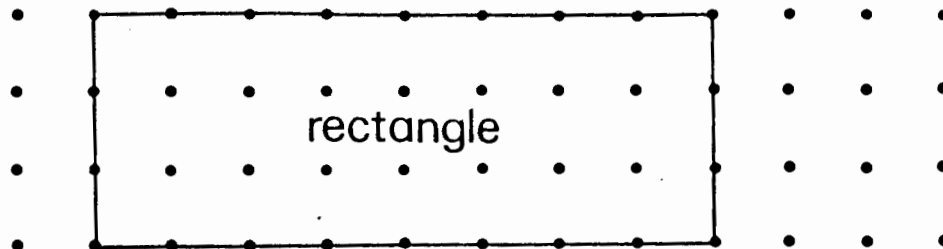
Here are 5 s _____

Copy and complete



Here are 4 r _____ s

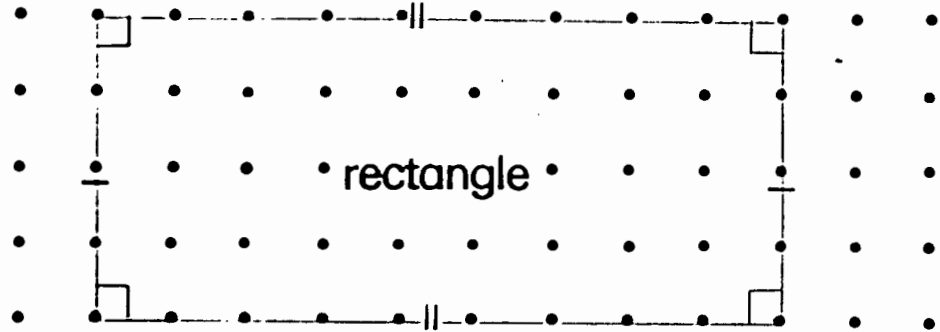
Copy and complete



Here are 5 r _____ s

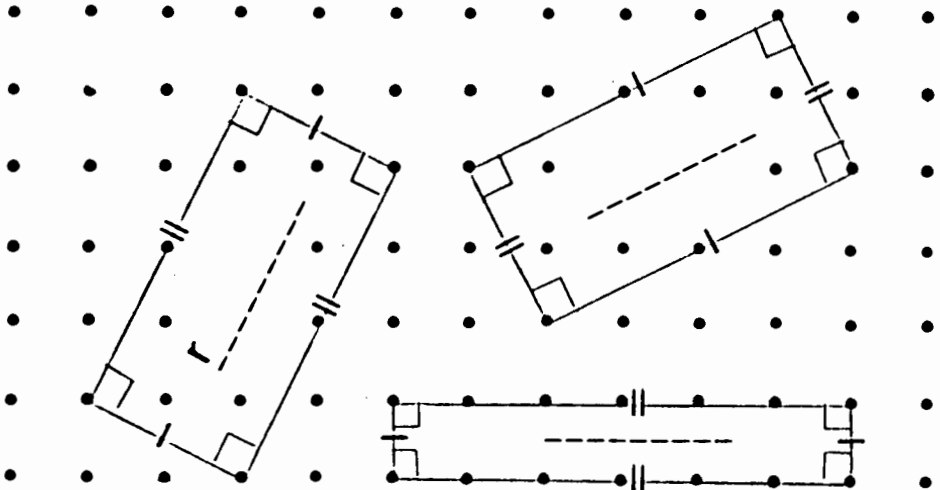


Copy and complete



In a rectangle

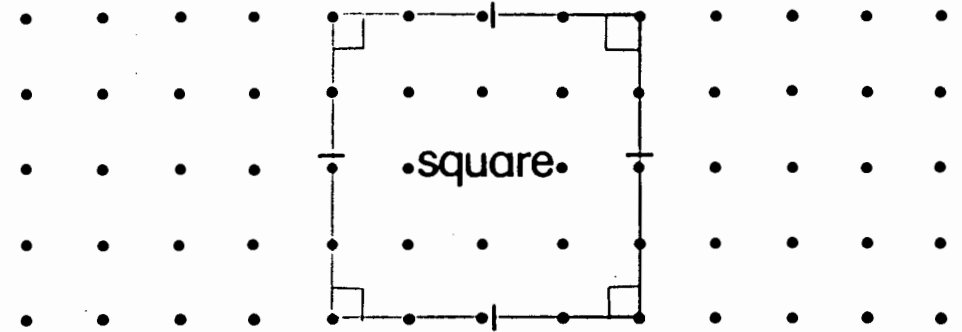
1. All the angles are right angles
2. A right angle is 90 degrees
3. Opposite sides are equal



All the angles of a rectangle are r_____ a_____

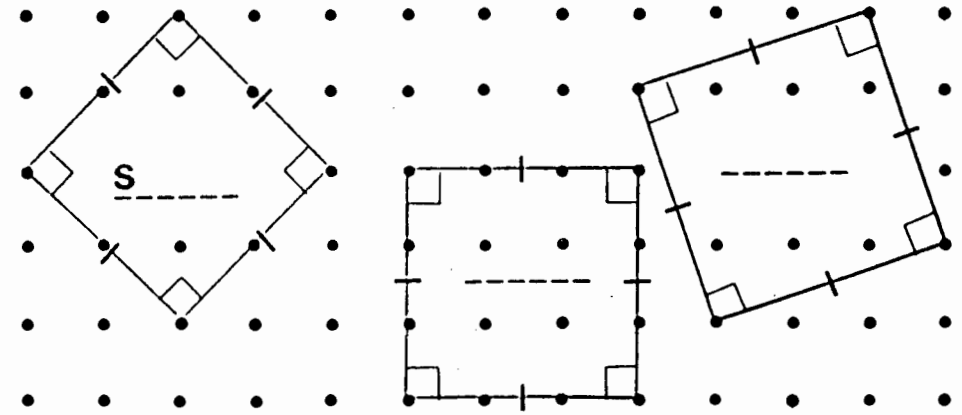
The opposite sides of a rectangle are e_____

Copy and complete



In a square

1. All the sides are equal
2. All the angles are right angles
3. A right angle is 90 degrees



All the sides of a square are e_____

All the angles of a square are e_____

APPENDIX E.

Mathematics Lesson - Monday 5 May

Group work - Geometric shapes
Length of lesson - 60 minutes
Explanation and Mod - 10 minutes (50)
Discussion of video and Mod - 20 minutes (30)
Activity - 30 minutes
Number of activities per group - (3)

1. Economical Weaving - 44 copies
2. Circle drawing
3. Measurement - Activity taken from books in library - centicubicle activity

1. Draw a circle (2 together)
2. Weaving Sheet or Card 44/46 page 27
3. Metric Robot Man (2 or 3 together)

Draw a circle

1. Provide a number of round objects (different sizes)
2. Provide pin; string and small pencil
3. Provide plain paper
4. Semi circle? $\frac{1}{4}$ circle? (tupper lids)

Make patterns with circles

What things around us at school, home etc. have a circular shape?

Photocopy:

- (1) Work sheets - Measuring
- (2) Circles

1. Finalize Worksheets - Measuring
2. Write worksheets for circles.

Lesson.

Circles.

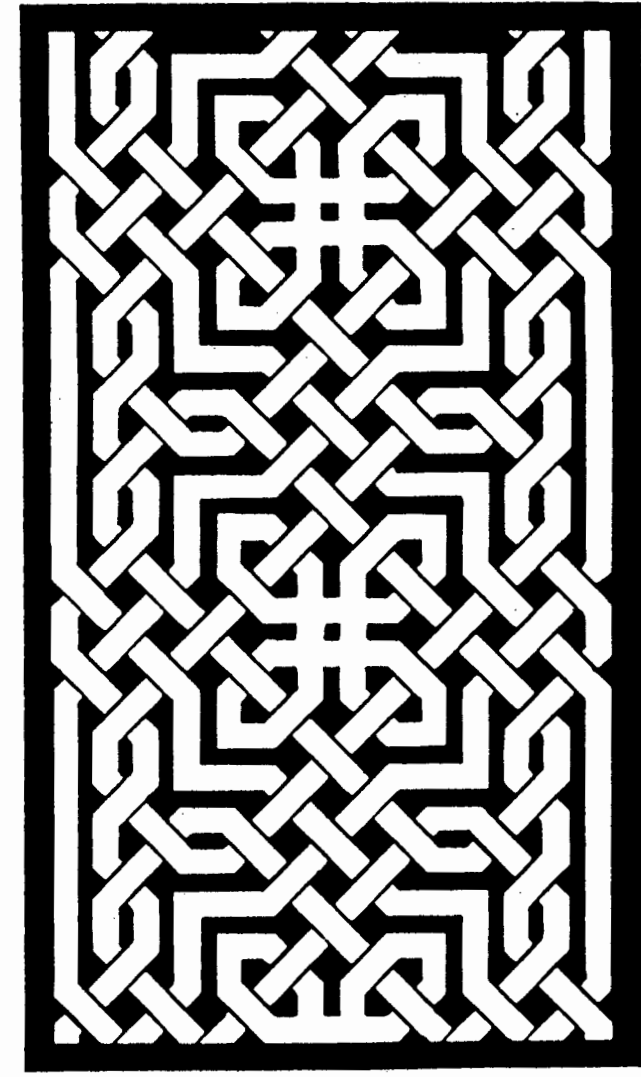
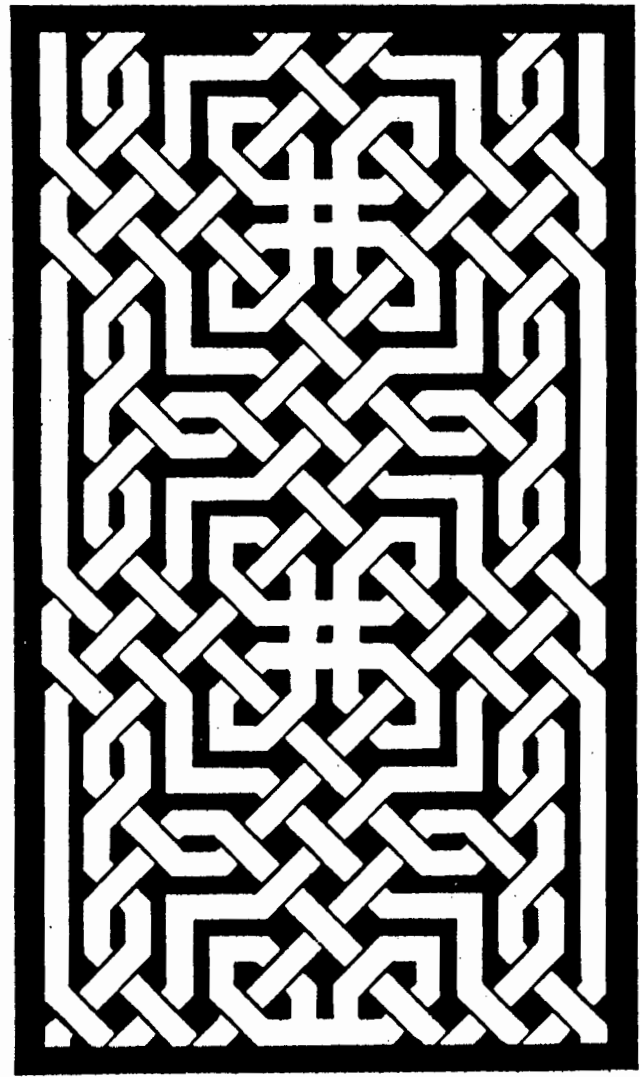
1. Draw some circles - on the plain paper
2. Use all the objects to draw circles with
3. How are you going to use the string; pencil and pin to draw a circle?
Why is it a good idea to use the pencil, pin and string to draw circles?
4. Can you make some interesting patterns with circles?
5. What things around the house and school are circular?

Economical Weaving

Colour this pattern so that the same colour never crosses itself.

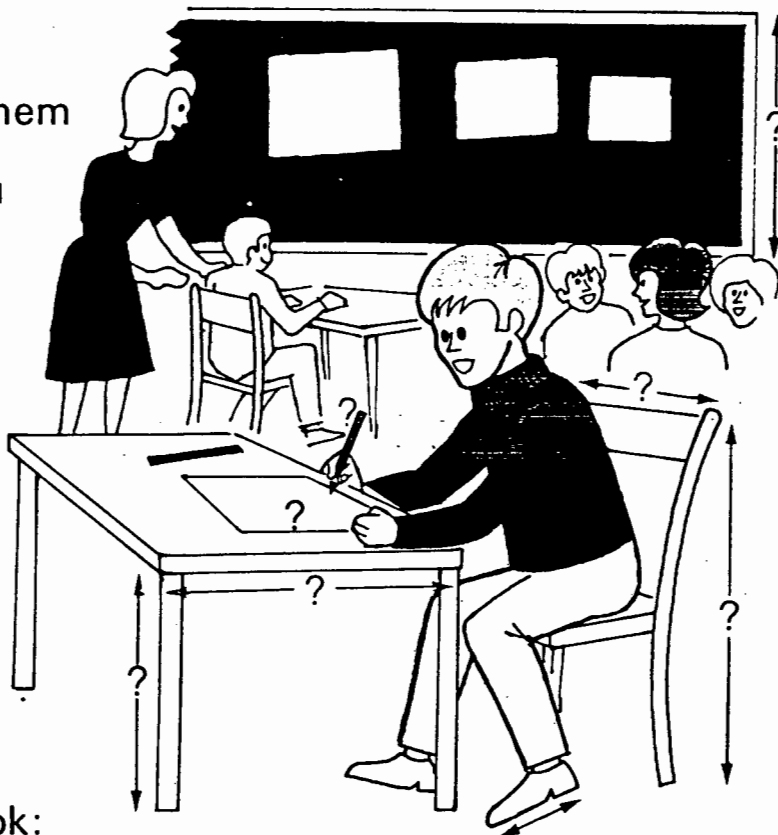
It is possible with 5 colours.

Try it!



Guess some lengths in your classroom.

Now measure them
with a rule or a
centicube rod.



Make a list like
this in your book:

	my guess	my measurement
the length of my pencil	<input type="text"/> cm	<input type="text"/> cm
the width of my table	<input type="text"/> cm	<input type="text"/> cm
the height of my table	<input type="text"/> cm	<input type="text"/> cm
the length of this workcard	<input type="text"/> cm	<input type="text"/> cm
_____	_____	_____
_____	_____	_____

APPENDIX E.

1. What are patterns?
e.g. on board - Why are these patterns
2. Can we make patterns with other things?
3. What about letters?
4. What about numbers?
5. Activity.

Awareness of Shapes

Why are they these shapes

Why do we use squares and rectangles?

Why don't we have round houses?

Why don't we have square houses?

Why a round ball and not a square ball

Geoboards

people - children to make

CLEAR DIRECTIVES

finished product

jot down points - to order thinking

- * Worksheets not too easy
- * Dotty paper and draw own squares
- * How did they know how to draw a square
What rules did they follow?
- * Allow 1 group to follow directions.



Triangle Spirals

Copy this spiral ...
... use dot isometric
paper ... start near
the centre.

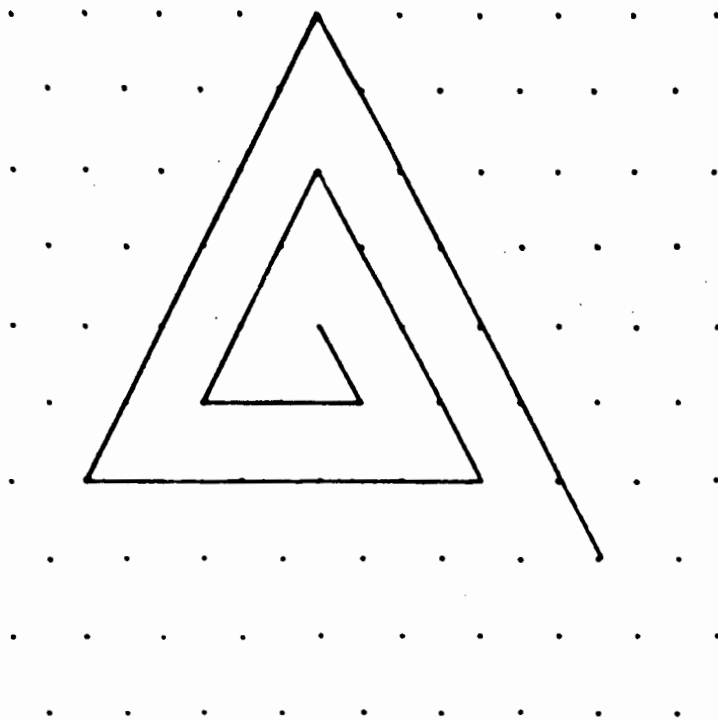
Count the number of dots
on each line.
Write them in a list:

2	3	4					
---	---	---	--	--	--	--	--

Guess how many dots on
the next line.

Count them.

Can you see a pattern?



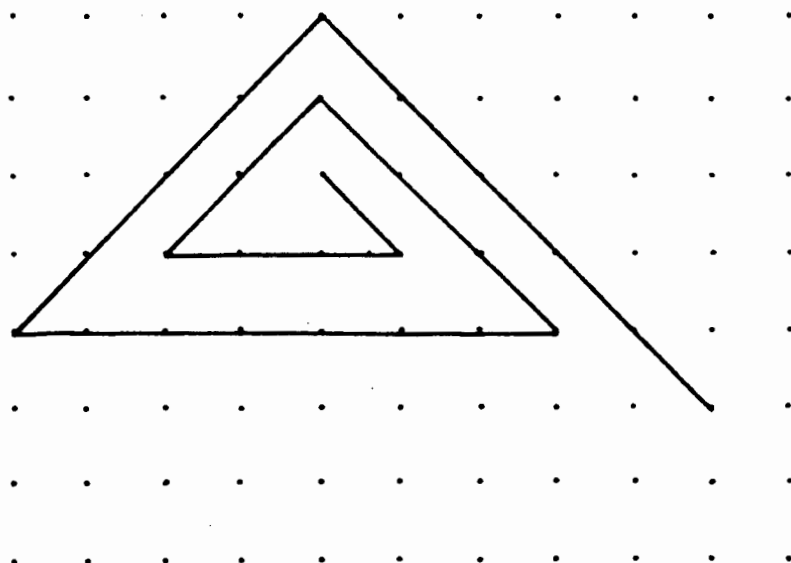
Copy this spiral ...
... use dot square paper
start near the centre.

Count the number of dots
on each line.

Write them in a list:

2, 4, 3, 4, ...

Guess how many dots on
the next line. Count them.



Can you see a pattern this time?
If not, write your answer like this

2		3	4				
	4						

Project A

TOWARDS A LIBERATING PEDAGOGY FOR MATHEMATICS EDUCATION.

1. INTRODUCTION:

The work that I have done for this particular project has marked tremendous growth for me as teacher and as person. The recommended reading opened up a new world to me. I discovered thoughts and ideas that affirmed many of my own ways of thinking about the educative process. Paulo Freire's works, in particular, provided an experience which only be described as a homecoming. I also became aware of many other important issues concerning myself as teacher and how I related to my pupils and the many ways I had unwittingly reinforced the oppression I despised. In the past when I voiced my concerns about the use of authority and discipline to colleagues most of them regarded me with disdain. After all it was for the good of the children that authority and discipline were exercised. But whose "good" had we actually been concerned with? In my experience, at the various schools I have taught at, it was definitely not the child that concerned us most.

What frightens me is the fact that after seventeen years of academic learning (domestication?) it has taken a masters course to bring about critical thinking as to how I experienced the education system that I was involved in. I have only now understood how I could be employed as an agent of the oppressing school system as found in the white schools in the Cape Province.

While reading and attending lectures specifically designed for this project I was able to experience myself as a worthwhile person. For the first time in any learning situation I was treated as an equal and not a lower form of life. The content of discussions and lectures made me aware that I had been subjected to oppression and domestication through past learning experiences. Reading works of Fromm and Freire I was brought to the awareness that to escape from the domestication brought about by my previous learning experiences and socialisation I would have to allow myself to develop into a loving, non-narcissistic person. This discovery supported the growing realisation of my own self - worth.

2. The educational system as I have experienced it:

As an under - graduate I was exposed to lecturers whom I regarded very highly. They used this opportunity to literally brainwash me into a system of Christian National Education. These people, whom I admired and considered to be philosophers and thinkers, merely because they happened to occupy certain teaching posts at a university and had certain academic qualifications, were no better than the people who use mass meetings and slogans to stir certain emotions and ideas amongst the people. I was given an orientation to the theory of Christian National Education - which is the educational philosophy for white schools controlled by the government.

I was shocked to discover that in actual fact I had been thoroughly taken in by the ideas as they were presented - mainly because of the people who presented them and not because of any thought on my behalf.

This system of Christian National Education has been bothering me ever since I realized that many of my uncertainties, insecurities, and heartaches concerning my teaching practice stemmed from the things I had been coerced into learning. I quote one of the more trivial things that bothered me. Unfortunately, while teaching, it didn't appear so trivial.: "Die bron van die opvoeder, spesifiek die onderwyser - opvoeder, se gesag." (Gunter, 1973:155)

Gunter says that the teacher's authority is founded in the fact that the teacher stands in place of the parent. (What am I, a mere baby-sitter?) He points out that I, as teacher, am a representative of society and therefore must inculcate the values of society in the children. He does not state what I should do if I hate what society and its values are doing to the people I care about. To make matters worse, he goes on to give God the blame for having to enforce some irrational and inhumane rules on children. Furthermore, he says that we are superior in knowledge, wisdom and experience and we, as teachers, will know what is good and bad. This I see as being extremely dangerous because this amounts to playing God and it assumes that I know the child better than the child knows him/herself. Experience has taught me that these, so called, ignorant children can teach me quite a lot about the world about me.

I could never see myself as fitting into this mode of teaching and I always ended up hating myself thoroughly when I was pressured enough into trying to put it all into practice. I had the idea that every person, child or adult, has certain strengths and weaknesses and that a child's strengths could very well supplement my weaknesses and vice - versa. I have never thought it necessary to use heavy - handed discipline on children. I thought that learning experiences were shared experiences and that children were entitled to be their own masters. But Christian National Education does not recommend a very friendly relationship with the children. Dovey (1984:4) cites the example of Anne, a teacher, who felt that it was important for her to establish a friendly relationship with the children. She found this to be virtually impossible and says: "... but here the classroom situation is something awful." While studying Christian National Education I cannot remember ever being invited to question, critically, the theory that was being presented. At eighteen years of age I was afraid of the authoritarian "teachers" that had taken charge of my learning. I stood in awe of them and I could not summon the courage to question them or the theory. Because they presented themselves as experts their teachings were safe from any criticisms from their students.

The language style used to convey this philosophy to students was very grandiose and even biblical at times, serving to further alienate the students from the lecturers and imposing the idea that I, as student, was totally ignorant and incapable of such exalted thoughts. Who was I to question the great minds who could write like that? Now, on hindsight, I realise just how ridiculous some of the concepts of Christian National Education are, especially if one regards them in the light of the gross inequalities that exist in South African society, today. To quote Gunter: "Omdat die deure van die skole in 'n demokrasie vir almal oop staan, vorm die skool ook 'n lewende eenheid - in - verskeidenheid, wat deur gemeenskaplikheid van waardes en doelstellings, intelligente samewerking 'n gevoel van samehorigheid en vrye geestesinteraksies gekenmerk word." He says many things about democracy and equality but our very situation in the R.S.A. makes these statements look rather ridiculous.

The theory of Christian National Education requires children to behave in total obedience to authority. They are forced to obey this authority by the application of severe discipline with the result that children become enslaved to total obedience through fear.

Reading through these text books again I experience revulsion as I picture children being dominated by superior adults and being led to lead quiet obedient lives in service of "volk en vaderland" (Afrikanerdom being the actual implication).

Oppression is made easier, for those in seats of power, if our children are to grow with this kind of educational thought.

Whenever I thought about the principles of Christian National Education that I was trying to implement I experienced the uneasy feeling that I was doing someone's dirty work and often asked myself if what I was doing in my classroom wasn't labelled as brainwashing when used by certain socialist countries?

During April this year I visited a school for Asian children in Rylands Estate, Cape Town, where I taught and supervised students who were practice teaching. The teachers there were shocked when they saw video-taped material of a lesson taught at a school for white children. They had never seen white discipline and authoritarianism at work!

I now feel a lot of bitter resentment towards the education system as it exists in schools for whites in the Cape Province. This feeling is reinforced when I witness and experience the inhumane, frightened people who are making and perpetuating this policy of Christian National Education stopping at nothing to promote Afrikaner power structures.

3. **The necessity of such a strict and authoritarian system of education.**

In our capitalist society financial groups have arisen which are reluctant to relinquish the power and control they have over people because this control ensures their powerful and wealthy existence.

To maintain their powerful positions in society these elite need as many obedient, domesticated workers as possible. Their wealth and power has accumulated because they have been in a position to exploit the workers who are totally dependant on the sale of their labour to keep themselves clothed, fed, and sheltered. Unemployment and an unjust system of education makes the bargaining power of these oppressed people that much less and the power of the oppressors that much more. These oppressors definitely do not want the oppressed to become critically aware of this exploitation. So, they use their power and methods of control to ensure that schools will continue producing obedient, domesticated people.

To increase their wealth, and likewise, their power, the power - groups that control production need increasing numbers of consumers to create a demand for the endless line of products that are produced.

To create this market the producers have to make the ordinary people believe that they are incomplete as they are. By buying a certain product their lives will become more complete. Good, obedient "products" of the school system will believe experts (authorities) when they are told that they are not quite up to standard. These people then are vulnerable to suggestions as to how to be more acceptable to society and so begins the vicious circle of our modern consumer - orientated society. The oppressed believe what is told to them by the technocrats and experts. The oppressors ensure that the oppressed are socialised into having a high regard for these so - called experts. This is successfully achieved at school. One merely has to consider the social prestige and the privileged career opportunities available to matriculants who have achieved in science and mathematics to realise that this is true.

To maintain this taken - for - granted assumption that technicians and experts are to be respected and believed unquestioningly, they enjoy an exalted status within our society.

Many people living in our consumer - orientated society have lost the most basic human quality - the ability to love, because of an over - emphasis on technicism and materialism. Man has been alienated from the people closest to him resulting in dehumanisation. He tries to be the person he or society thinks he is supposed to be: "Whose artificial smile has replaced genuine laughter, whose meaningless chatter has replaced communicative speech, whose dulled despair has taken the place of genuine pain." (Fromm, 1979:16)

Man feels powerless to change much of the structure of his society and sees his reality as an unchangeable certainty. We forget that our society has been established by other people, like ourselves, and therefore should easily be open to change. We cannot experience ourselves as the shapers of our own fate: we follow herd - like the recommendations of the so - called experts and in so doing lose our dignity and are de-humanised.

So, while man remains immobilised by his modern lifestyle of technicism and consumerism he is controllable by the oppressors. Children who have been subjected to strict authority and discipline in school are likely to grow up to be obedient and domesticated adults. And so the task of controlling the oppressed is made so much easier for the oppressors.

4.1 The social training - ground : The School.

Our schooling system plays right into the hands of the elite ruling class or oppressors. At school, teachers reinforce the social construction of our reality and school pupils are not to rock the boat. Christian National Education as enforced in the schools of the Cape Department of Education ensures that children are subjected to strict authority and discipline. Anyone trying to effect change is discouraged from doing so. Teachers are made to feel insecure and strategies are used to break down the unconventional methods used by teachers who try and humanise their teaching. (Dovey, 1984)

As our children are not taught to question the so - called expert or authority, they are doomed to live the same empty existence that their parents and teachers are living, instead of questioning that which rules their life - world experience. This is why Paulo Freire's works have come to mean such a lot to me as a teacher.

Bringing the learner towards critical consciousness will have to be seriously considered by educators if we are genuine in our attempts in trying to create a happier and more meaningful way of life for our children.

4.2 Mathematics education reinforces the social construction of our reality.

Does mathematics, as we present it in our schools, reinforce the oppression that is prevalent in society? To answer this question I quote the following: "It is necessary to increase the interaction between maths education and critical education; if maths education is not to degenerate into one of the most important ways of socializing children into the technological society and at the same time destroying the possibilities of developing a critical attitude towards precisely this technological society." (Skovmose, 1985:337)

"For over 20 years I worked under the delusion that I was teaching mathematics. The social pressures I put upon the kids were designed to make my maths teaching more effective. I now realise that I was really teaching social passivity and conformity; academic snobbery and the naturalness of good healthy competition, and that I was using mathematics as an instrument for achieving these things." (Masterman in Maxwell 1986:2)

Because man lives in a society that is determined by technology every individual's life is determined by this technology. Skovmose (1985:348) says: "In the educational system maths education serves as the most significant introduction to the technological society. It is an introduction which both endows (a part of) the students with the relevant technical skills, and at the same time endows (all) students with a "functional" attitude towards the technological society. "(Functional is seen from the perspective of the dominating power structures.)"

Some children learn that they can easily cope with certain technical skills or the mathematics as taught at our schools and become aware of their superiority and even start behaving as an elite group. The children who are singled out as the "brains" of the school probably hate being classified as "different." This classification often serves only to alienate them from their peers and make them feel even lonelier than they already are. These children are just as unable to think critically about their situation as those who are not the bright ones and are therefore forced to engage in various stressful behaviours to be acceptable or to try and compensate for their loneliness.

On the otherhand, because society regards the ability to achieve at mathematics as indicative of intellectual ability the children who feel they cannot cope with the maths are subordinated both to the subject and to those children achieving well. They experience themselves as having little intellectual or societal value. Society may accept these people but usually behaves paternalistic towards them. Society really values the technologists, scientists and mathematicians.

Unfortunately the children in our Christian National Education dominated schools remain oblivious to the forces that are shaping their lives and easily fall prey to people who want to dominate them.

5. **Critical mathematics education - a necessity?**

Mathematics education is not neutral as the above quotes prove. A critical mathematics education is necessary to bring the children to an awareness of the socialisation that occurs in our mathematics education. This will ensure that a process of democratisation is implemented. (Skovmose, 1985).

Critical mathematics education must educate the children to an awareness: an awareness of the constraints that society forces on them. They must be aware as to how these constraints are enforced. The children must be aware of oppression in all its forms.

6. **A critical mathematics education programme - is it possible in South Africa?**

The education crises we are experiencing at the moment in our country serves to emphasise the fact that change is of utmost importance.

The attempts by Frankenstein, in Massachusetts (Frankenstein, 1984.) and Gerdes, in Mozambique, (Gerdes, 1985.) based on the theory of Freire, to bring the educatee to conscientization seems to possess very little that can be successfully applied in our school system.

6.1 **Change and how it could occur.**

A violent revolution to overthrow the oppressors and start a new educational system can be instituted. But the danger constantly exists in this revolutionary type change that one group of oppressors is merely exchanged for another group who act in the so - called interests of the people. This new group of oppressors then in turn oppress others and in so doing cause themselves and the oppressed to be dehumanised.

The question of change is an extremely difficult one especially in the South African context. When, on the one hand, I see the slow change causing teachers and students around me to feel angry, bitter, resentful and hostile and on the otherhand I see the reluctance of the people who are responsible for the determination of our educational policies reluctant to relinquish any control then I wonder if a violent revolution isn't the only answer

Freire cautions: "The man who has made a radical option does not deny another man's right to choice, nor does he try and impose his own choice." (Freire, 1977.) Freire also emphasises the important part that radicals have to play when change must occur pointing out that radicals are the people most likely to bring about solutions that will be found with the people and not for them. He warns against sectarians whom are unfree people. This change cannot be superimposed on the people. (Freire, 1977.) I, as a teacher can be an effective agent of change with the children in my class if I work within a pedagogical framework that will bring about a liberation within my classroom.

The attempt by Gerdes in Mozambique failed because it wasn't a truly liberating pedagogy that had been instituted. There is no evidence of the Freirian concepts of dialogue, trust, love and hope. "His (Gerdes) examples of dried fish and

circles, freedom fighters and multiplication and similar points of relevance are sadly weakened by his inability to transcend an essentially basic level of maths education to deal with square roots, tucked so neatly at the end and so obviously without any significant social link." (Mitchell, 1985.)

The oppressed people in our country have made a very pertinent demand for an alternative education. But considering what some student teachers have included in worksheets that could be used for this alternative mathematics education (Breen (ed), 1986.) I do not regard these as forming the basis of a liberating pedagogy that will bring pupils to regard themselves as in control of their lives, as worthy people and dignified humans. It will make them aware of injustices and of many other taken - for - granted assumptions in society. Children should not see themselves as mere interpreters of data but as people who can generate meaningful knowledge.

These worksheets must go together with a pedagogy and class atmosphere that will allow children to feel that they are in control of themselves and that they are capable of changing power - structures within their classroom reality.

Doing these worksheets in schools, especially schools for black, coloured and asian children could easily raise criticisms as to why do they do the "alternative" (easier?) maths but the white children continue with traditional (elitist) maths?

Many traditionalist teachers would not accept this kind of material and would rather go on teaching in the traditional way. I have an idea, too, that this material would be banned in the schools where they would be of most learning value.

If the tables of power were to be turned, this type of education material should not be necessary - a free and just society is the aim of those who propose the change. So educationists need to look further ahead. They need to consider establishing a pedagogy that will maintain a free and just education.

Primary schools have a further problem in that pupils may not have developed the reading and writing skills necessary to cope with this kind of activity. Designing an alternative mathematics education for the primary school child often boils down to shopping lists, questions involving marbles or walking to school. These activities tend to be contrived and unauthentic.

The alternative mathematics worksheets could be used profitably in classrooms but teachers would have to use them judiciously. Advantages of using this kind of material are:

- (1) They deal with familiar and interesting examples i.e. they are directly related to the child's life - world experience.
- (2) The teacher and child experiences the "problem" as novel and they experience an equality of being learners within that given context.
- (3) They will break the strongly held belief in our present day society that there is always one correct answer.

- (4) Children could realise the usefulness of collecting data and putting it in an orderly form.
- (5) Children realise that there is a big difference between a "fact" and its interpretations.
- (6) Attitudes towards knowledge and learning of maths would be changed. (Fasheh, 1982.)

6.2 The characteristics of a liberating pedagogy:

As a teacher wanting to provide a liberating experience for the children in my class I would want a pedagogy that:

- (1) will make my pupils aware that there are various forms of oppression within their world and that these forms of oppression force them into certain ways of thinking and doing.
- (2) will make them aware that this oppression has dehumanised them and thus they see themselves as valueless and unable to change their situation within the world.
- (3) will enable the children in my classroom to take charge of their own learning that they may experience a sense of having the ability to be in control of their own lives and that they may see themselves as human and possessing all the wonderful gifts that go together with being a dignified human.
- (4) will provide the opportunity for the children to relate to me as the teacher in a sense of dialogue. Freire describes this dialogue as one where there is a united reflection and action. It is essential that this dialogue be founded on love, humility, faith, trust, hope and critical thinking. If one takes all these facets into consideration then it is unlikely that this pedagogy will fall into the trap that Wheeler warns us of when he says that we are not to be "warm, accepting therapists." Therapists tend to be there to listen only and to give affirmation to the client but the teacher in dialogue with the child has not only to listen but he has to respond to the child as a co-learner.
- (5) will be relevant to the pupils - but not only in a social context. It must stimulate their learning and powers of thinking and must culminate in very personal learning and growth.
- (6) will be democratic enough to give children the ability to opt out where they feel the wish to. This could be vital feedback for me, the teacher.
- (7) will show children that mathematics is an activity that does not always give rise to neat, correct work and pre-packed formulae but that the process of learning to mathematise can be essentially "messy" and trial - and - error is often the way of searching for "solutions."

- (8) will make it clear that mathematising is a general human activity and is not only for the elite. "That axioms are not God-given or Nature-given but rather they are statements that evolve with time and through a long and hard process." (Fasheh, 1982:4.)

This type of pedagogy will result in attitude change amongst the learners and teacher, too. Values and basic assumptions will change as well. Fasheh, (1982) warns that this type of pedagogy might be costly to the teacher. The price the teacher pays varies directly with the power of authority (subtle or direct) and the effectiveness of the teacher.

6.3 Essential structures of a liberating pedagogy:

I think that to reach this kind of pedagogy one would have to try and combine the ideas of Freire, Wheeler, Gattegno and others who propose the humanisation of mathematics education.

Children must become aware of their ability to change existing constraints with which they are faced in the classroom. Only then will they be on the way to liberating themselves. The power of the learning process must be in their hands. (Giroux in Freire, 1985.) Wheeler and Freire agree that children and teachers have to experience education as a humanising process and by combining the ideas of these two great men I feel that we could have a sound basis on which to humanise maths education and make it critical.

6.3.1 Humanisation and Democratisation:

Whereas Freire perceives the learner as dehumanised and has to be humanised by a liberating education, Wheeler says it is mathematics that has to be humanised. The learner has to be brought to a consciousness of his own power as a dignified human who is in control of his own learning and the reality around him.

Wheeler's thoughts on humanising maths accord with the Freirian thought of the democratization of the learning process. According to Freirian thought the educator may not start from predetermined points and he may not elaborate "itineraries" for research. This accords with Wheeler's idea that the child must have the freedom to take his learning where he wants to take it. In this sense the teacher is no longer the "expert" or agent of the oppressor but seen as participating with the children as co-learners in the educational situation.

"The teacher is (no longer) the - one - who - teaches but one who is himself in dialogue with the students who in their turn while being taught also reach. They become jointly responsible for a process in which all grow." (Freire, 1972:55.) This "growth" experience is emphasised by all those who propose a humanist approach to maths. (see Kent and Hedger, 1980.) Wheeler says that teachers cannot possibly consider themselves to be experts because we, the teachers are educating for an "unknown" future. (Wheeler, 1971.)

6.3.2 The task not the teacher.

Wheeler emphasises that the teacher is not to use his individuality or personal characteristics to motivate the children to learn. This will lead the children to try and establish what would please the teacher and try and obtain that rather. This way of teaching would heavily emphasise the hidden curriculum. This is supported by Freire's thought that it is not the educators role to "speak about our own world view, nor to attempt to impose that view upon them but rather to dialogue with the people about their view and ours." (Freire, 1972:68.)

Whereas Freire emphasises the generative themes and the reality of the educatees life - world Wheeler emphasises that the task must enjoy the focus of the learner's attention.

Here one can discuss the relevance of the task to the learner. If one is to think of relevance merely in terms of social situations then we are going to have worksheets as designed by the U.C.T. student teachers (Breen (ed), 1986) abounding in the classroom. It is necessary to go further than this when thinking of relevance in terms of the children within our classrooms. One would hardly think that the topics chosen by Kent and Hedger (1980) were relevant but the crux of their teaching was the relevance of presentation. To be caught up only in things that have social relevance will not provide for this "growing tall" experience where children could develop as in the case of Simon described in the article. It is interesting to note that Freire says that once man's critical perception is embodied in action, a climate of hope and confidence develops which leads men to attempt to overcome the limit situation (of their reality). It seems obvious that if we are to teach in a Wheeler way children will come to believe in themselves and the power of critical thought that leads to problem solving. So they will develop the confidence and certainty that will enable them to be more hopeful about their own abilities.

6.3.3 Dialogue

Freire's pedagogy is based on the idea of dialogue and Wheeler also emphasises the necessity of a dialogue with the children. If one considers the phrases/questions he would use one will see that the responses to them reveal ways of thinking both of the teacher and the child. (Wheeler, 1970.) So it is a dialogue and not merely a communiqué. Freire warns us strongly against the use of the latter.

6.3.4 Activity never passivity.

Another important feature that arises from both Wheeler's and Freire's work is that of activity or praxis. Wheeler says that activity is personal whereas (book?) knowledge often seems impersonal. The child feels a sense of ownership over that which he has "done." Freire maintains that through praxis the educatee may experience himself as in control. It is therefore clear that activity is essential to allow the child to experience ownership and control of his/her labour as well as able to transform their reality. Freire says that oppressed man is submerged in a culture of silence and is thus an object, kept there because of his inability to act within his reality. (Freire, 1985.)

Education as it is practised in our schools today seeks to keep man submerged in this culture of silence and Wheeler also rejects this "education for adjustment (... but some people will always have to be dustmen...)" as the greatest "contemporary wickedness" (Wheeler, 1971:39.) He says, as does Freire, that education should show the children that they can transcend what society expects them to do. When one can act out these choices and transcend the expectations then you are subject and in full control of your own existence.

I think that at the basis of Freire's and Wheeler's work we find concepts which are basic to the thought of Fromm and his vision of man: namely that man is a naturally active being and it is only due to the pressure of modern life and work that he seeks an unnatural "laziness." Dennis Gleeson (1980:5) says: "The importance of Freire's contribution to the sociology of knowledge rests in his timely introduction of an alternative concept of man - man standing on his own feet as an active enquirer, rather than a passive receiver of the ideas of others."

Gleeson questions the practicability of Freirian theory but admits that one cannot reject it either. Undoubtedly there are questions regarding the ways to apply these theories in our classrooms. The only way I can help anyone towards liberation from the dreadful oppression that permeates our everyday existence is by using a combination of these educational theories. For, I feel, that there is scope to make it practically possible within the schools of today. I may find ways of adapting syllabus topics to fit in with these ways of thinking whereas with the alternative maths programme it will be more difficult and I would stick out like a sore thumb within the school. What is more, I would probably be dismissed or even worse I could find myself behind prison bars. Subtlety will have to be the key issue here.

7. Practical implications

7.1 Activities

Activities as suggested by Breen (1986) will be the way I would choose of implementing the theories that I consider would result in a liberating pedagogy. These include:

- (1) mathematical investigations. (Appendix A)
- (2) do, talk and record activities (Appendix B)
- (3) deep structure activities (Appendix C)

Deep structure activities are those that seem to be the least accessible to teachers at present. It is extremely difficult to draw up these activities. Criteria which I would use when compiling worksheets of this nature would include:

- (1) Everyone must find entry into the activity but the task must not be so easy as to appear trivial.

- (2) It must be engaging and challenging
- (3) It must present exciting opportunities
- (4) Does it problematise a reality?
- (5) Does it give the children power over their own learning?
- (6) It must be clear about what is to be learnt.
- (7) The rules that are to apply must be clearly understood by the class.
- (8) It must present opportunities for pupils to explain their thought processes and how they came to solutions.
- (9) It must create opportunities to generalise findings.
- (10) Does the worksheet present maths as imagery and movement?
- (11) Does it encourage the child to think intuitively about mathematics?
- (12) Will the worksheet create tension/conflict/or any other dynamic situation in my classroom?
- (13) The work must: lead to changing levels of ability and must transform attitudes, confidences and performances.
- (14) Are any constraints that exist on the worksheet necessary?

7.2 Support structures

To maintain oneself in this mode of teaching one will require affirmation and support from colleagues, friends and family. (Dovey, 1984.) Colleagues will have to be persuaded that this is a good method of teaching. This could be done by showing video-taped material of children engaged in these kinds of activities so that teachers can see it working and then feel the need to teach in this way.

Study groups could also be formed where teachers could meet and exchange ideas and worksheets that they have found to be good. This must be an informal social experience where teachers can relate to each other in a warm and friendly way. Here we as teachers could help keep one another critically aware of society around us and in the schools.

8. Conclusion

The time for playing safe is over within the context of the schools in our racist, oppressive society in South Africa and it is about time that those who have convictions about a fair and just society and education started acting from the strengths of those convictions.

I think that the type of pedagogy as set out in this essay will give children confidence in their intuitive thought processes and will help them demystify the taken - for - granted assumptions that inhabit their life - world experience of mathematics. I do not believe that children who have been exposed to this kind of pedagogy would face the world fatalistically or statically.

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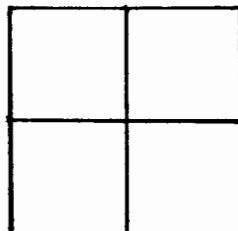
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APPENDIX A

CHESSBOARD : A MATHEMATICAL INVESTIGATION.

How many squares here?
Five! Where are they?

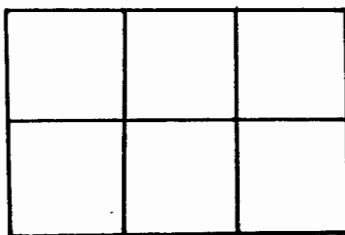


How many squares on a 3 x 3 board?
on a 4 x 4 board?

So how many squares on a chessboard? (8 x 8)

What about other rectangular boards? e.g.

How many squares here?



Can you generalise your results?

How many squares on a $m \times m$ board?
on a $m \times n$ board?

(No. 26)
(Hardy (ed), 1982)

APPENDIX B

DO, TALK AND RECORD ACTIVITIES.

To play the Shade-in game you will each need four pieces of scrap paper. You'll have to fold each piece of paper in half and then in half again. Then fold the piece twice more. When you unfold the paper you should find that the fold lines mark out sixteen equal sections. Each group will need one die marked with one sixteenth, one eighth, one fourth, two eights, three sixteenths, and one half. Each of you should throw the die in turn. The score on the die tells you how much of one piece of paper to shade in. Gradually the first piece of paper will become completely shaded in and you will need to move on to the next sheet of paper. The first to shade all four bits of paper is the winner of round one. By turning the four bits of paper over, you can play a second round.

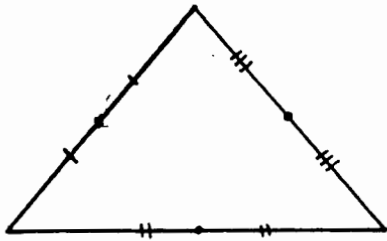
BUT nobody is allowed to shade in any part of their paper without first telling everybody else in the group what areas they are going to shade and why. That's why the game is called the What-and-Why Shade-in game.

(Breen, 1986.)

APPENDIX C.

DEEP STRUCTURE ACTIVITY.

For the next three days, arrange yourselves in groups of your own choosing, and see if you can make any theorems of your own arising from the diagram below:-



(Breen, 1984.)