CHAPTER 4
THE RESEARCH METHODOLOGY USED IN THE STUDY

4.1 Introduction

In this chapter I will describe and motivate the choice of the research methodology I developed and used to investigate the particular problem of this study. It will contain the reasons for its choice and include the overall research model, the planned data collection methods and the data analysis in detail.

4.2 Conceptions of social reality

Cohen and Manion (1989) contend that there are two competing views of the social sciences. The first, labelled the traditional or established view, is that the social sciences are similar to the natural sciences and therefore have to do with the discovery of natural and universal laws which control and determine both individual and social behaviour. The second, called the social view, contends that people differ from inanimate natural phenomena and from each other. These two contrasting positions and the reflections on educational research which flow from them, therefore, have their origin in different conceptions and interpretations of social reality. How the social world is viewed is based on the assumptions which underpin it. These assumptions according to Cohen and Manion (1989) can be grouped into three broad areas.

4.2.1 Ontological assumptions

These have to do with the very nature and essence of the social phenomena being investigated. According to one school of thought reality can be seen as being objective in nature and external to the individual while a competing view sees it as coming out of and therefore a result of one's own consciousness and cognition.

4.2.2 Epistemological assumptions

These assumptions are concerned with the basic form and nature of knowledge, how it is acquired and how it can be transferred to others. On the one hand knowledge is seen as being real and hard and capable of being communicated in a tangible form. Uncovering social knowledge in this way will require the researcher to take on an observer role and a positivist perspective. On the other hand, knowledge is seen as being more subjective, based on experience and insight of a more personal nature. According to this perspective knowledge comes from

within the individual. Investigations under this view will impose on the researcher the need to be involved with the participants and work from an anti-positivist viewpoint.

4.2.3 Assumptions regarding human nature

This group of assumptions deals with the nature and origin of man as well as the relationship between human beings and their environments. The first view of human beings takes a deterministic perspective and sees them as being conditioned by and reacting mechanically to their surroundings. The alternate view moves from a position of voluntarism and sees the individual as the initiator of his own actions and therefore the creator of his own environment.

According to Cohen and Manion (1989) the stance which the researcher adopts with regard to these three sets of assumptions will have direct implications on which research methods are chosen. Investigators choosing the positivist position and who view the world as real, hard and external to the individual, will use methods traditional to this type of research. These will be mainly quantitative and will make use of techniques such as surveys, tests and experiments. The purpose will be nomothetic in that the methods and processes will aim at deriving universal laws which govern and explain the phenomena being studied.

Researchers who take a more idiographic, subjective or anti-positivist approach will use more personal, qualitative methods such as observation and personal constructs. Their main concern will be with how individuals create, modify and interpret the world in which they find themselves.

These two approaches viz. nomothetic and idiographic, represent the two opposing views on a qualitative and quantitative continuum. In doing research investigators need to decide where to position themselves on this continuum (Cohen and Manion, 1989).

In deciding which of these two methodologies to choose I refer back to the opening paragraph (p.1) of the first chapter:

> "The story which unfolds on the following pages represents, on the one hand a personal
> educational journey into my own convictions and on the other hand a systematic and

planful search for educational answers to some of the issues which I believe will help
to provide quality education for the street children of our country."

Firstly, having been a teacher myself for twenty two years and for the remaining thirteen years
having worked closely with teachers in schools, I did not feel comfortable taking on the distant
and detached observational role of a clinical researcher. During my journey I wanted to
"immerse" myself in the reality of the problem, be part of it, experience it from the inside and
in so doing construct my own understanding of it and hopefully some of its solutions. These
solutions I believed lay within the situation, myself and the participants in the research and not
outside our beliefs. I agree with Burton (1986) who believes that problems are best solved by
those who own them, that knowledge is best acquired through interaction between what we think
and what we do, that meaning in education is more important than findings and that professional
questions should be answered on personal levels. Secondly, the nature of the study, being one
of a gradual, incremental and cyclical application and evaluation, lent itself far closer to a more
qualitative type of research. For these reasons I decided to conduct my research within a
qualitative paradigm.

4. 3 Action research as a qualitative research design

4.3.1 The origin and definitions of action research

Action research had its origin in the work of the American social psychologist Kurt Lewin
(1948) in the 1940's. The aim of this research was to join the experimental approach of social
science with social action in order to solve important social problems. Action researchers were
concerned with problems which grew out of communities rather than personal knowledge. They
worked to discover new knowledge which could be applied in these communities. During the
1970's this approach was adopted and used by the teacher research movement in Britain,
America and Australia. It was out of this movement that Carr and Kemmis (1986, p. 162)
proposed their widely accepted definition of action research:

> "Action research is simply a form of self-reflective enquiry undertaken by participants
> in social situations in order to improve the rationality and justice of their own practices,
> their understanding of these practices, and the situations in which they are carried out."

Elliott (1981) sees action research as the study of a social situation with a view to improving the quality of action within it.

If these definitions are applied to the educational context then Ebbutt's (in Burgess, 1985) synthesis of Elliott's and Kemmis's working definitions of educational action research, is appropriate. In his view action research is concerned with the systematic study of attempts to change and improve educational practice by groups of participants by using their own practical actions and by reflecting upon the effects of those actions.

Cohen and Manion (1989) mention a number of characteristics of action research. Firstly, it is essentially an on-the-spot procedure designed to deal with a concrete problem, located in an immediate situation with the findings applied immediately. Its main justification in the context of schools is the improvement of practice. It is empirical in that it relies chiefly on observation and behavioural data. This means that over a period of time information is collected, shared, discussed, recorded, evaluated and acted upon. In terms of education, the participants in the above definition could be a teacher or pupils and the social situation a shelter for street children or a school for them.

With regard to education Carr and Kemmis (1986) state that action research has been applied widely in education and covered areas such as school-based curriculum development, professional development, school improvement programmes, systems planning and policy development.

4.3.2 Types of action research

On reviewing the literature on educational action research Grundy (1987), Walker (1990) mention three types of action research. These three modes are based on Habermas's theory of constitutive knowledge interests i.e. that different kinds of knowledge are shaped by the particular human interest that they serve. For Habermas (1972) knowledge is never the result of a "pure" act of the mind which is removed from everyday concerns. Rather it arises out of the needs of people and is shaped by historical and social situations.

The three modes of action research are:

- *Technical action research*

   Walker (1990) states that this type of research emphasises rule-following, control and pre-packaged materials designed by outside "experts" for implementation. She further argues that the aim of this research is to promote "efficient and effective" practice by the teachers but is not concerned with their understanding of this practice. Change is reproductive and teachers are used as change agents.

- *Practical action research*

   Again Walker (1990) believes that this type of action research promotes the development of the teacher's personal judgement and understanding when decisions concerning classroom change are made for the benefit of the pupils. Choices for action are made because they are intelligent and are not merely correct and claim to provide guidance rather than direction. The research focusses on action which is informed so that change can be promoted in the classroom. However, Walker (1990) argues that practical research still lacks the critical element of how classroom action evades the wider social, political and structural environment and the climate in which the action is located.

- *Emancipatory action research*

   It is Grundy's (1987) opinion that emancipatory research promotes change through a critical consciousness which exhibits itself in political as well as practical action. Walker (1990) argues that the guiding ethic of this type of research should be the social and political ideals of justice, freedom and equality. Persons engaged in this research should do so with the purpose of changing education in the interests of those who are exploited and oppressed. Street children would therefore fall into this category. In this paradigm, research is carried out not merely to investigate the teacher's own teaching methods but to see if his or her interaction in the classroom is indeed democratic, transformative and empowering. Teaching is seen as a political act.

In trying to decide into which of the three types of research to locate my study, I took a more flexible interpretation of emancipation and extended it across the three levels. I therefore decided that my research would contain elements which were technical, practical and emancipatory. With regard to the emancipatory aspect of the research I realised that I would have to be accepted into the school and by the street children on a basis of trust. My involvement would have to deal not only with the technical and practical aspects of teaching

them but also with their "political" agendas and those of the school. These would be difficult and sensitive matters.

4.3.3 The process of action research

Lewin (1948) outlined the process of action research as a sequence of spiral steps. At the start the researcher becomes aware of a social problem which needs to be addressed and a desirable outcome which needs to be achieved. Lewin called this the general idea. This idea is examined with the means available and the plan to achieve this objective is formulated. If this planning is successful two aspects emerge. Firstly, the overall plan is conceived and secondly, the decision on the first step of action is made. This first step of action is then implemented. It is then followed by a period of fact-finding in order to:

- Evaluate the action.
- Learn and gather further insights.
- Be used as a basis for planning the next step.
- Be used as a basis to modify the overall plan.

Each subsequent phase is then composed of a circle of planning, executing and fact-finding about the result of the action.

Both Elliott (1981) in his *Action research: A Framework for self-evaluation in schools* and Kemmis and McTaggart (1988) in *The action research planner* make use of, adapt and expand on Lewin's spiral step sequence. Kemmis and McTaggart (1988), in their model extend the initial planning or reconnaissance phase beyond mere fact-finding to include discussion, negotiation, exploration of opportunities, assessment of opportunities and the examination of constraints. They also include a strong monitoring function throughout the implementation stage which includes an emphasis on rethinking, reflecting, understanding, discussing, re-planning and learning.

Elliott (1981) argues that the model should allow for a change in the general idea, that the reconnaissance should include not mere fact-finding but also an element of analysis. He argues that the implementation is not always straight-forward and easy and says the evaluation of the implementation stage should not occur until the extent to which it has been completed has been

monitored.

Ebbutt in Burgess (1985) is of the opinion that the action research cycles should not only contain feedback of information between cycles, but should also allow for smaller feedback loops within cycles. This would encourage adjustments to be made on an ongoing basis as new problems and solutions are perceived.

4.3.4 The action research model to be used in the study

In designing the model to be used in my own research, I drew on all four of the above models, adapting and adding to them to suit my purpose. If an emancipatory approach was to be considered, I felt the "political" and environmental influences impacting on the study should also be included in some way. I felt that the model should also capture the incremental nature of the solutions which I envisaged. Figure 4.1 shows my conception of the action research model I used in this study.

The model starts with a general idea around a problem that exists or has been experienced in practice. The problem in terms of this study centred essentially around three issues. Firstly, understanding what personal qualities a teacher needs to possess and use when teaching street children to enable them to cope psychologically and emotionally in a formal school setting. Secondly, understanding and creating an appropriate classroom and school environment, atmosphere and teacher/ learner relationship. Thirdly, discovering the best way of teaching street children in a school specially created for them. Specifically it was concerned with the teaching of science themes to grade eight children off the street, street children who were housed in shelters and other children who were at risk. However as supplementary information it also made use of grade seven, nine and ten students and the teaching of Mathematics and Science to all these grades.

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Figure 4.1   Action research model

The general idea involved finding a psychological, emotional and cognitive teaching style best suited to their needs and abilities when reintegrated into a special school established for them

The first phase of the action research model is concerned with reconnaissance. This phase is necessary to investigate the context of the research problem and to collect relevant information which surrounds and informs it so that a general plan for the research can be established.

Necessary information and background knowledge can be gathered by using the following techniques:

4.3.4.1 Exploration and observation

This stage would involve understanding the participants in the research, visiting the possible sites of the research to see if they were suitable and accessible, becoming familiar with the environment surrounding them and observing the influences acting on them. In terms of this study this would involve a number of aspects. Initially it would require me to find, have access to and become familiar with a number of street children. Through this close contact and observation I would gain some understanding of their psychological, educational and emotional requirements. Later I would need to establish or find a suitable formal school context in which to apply the action research model.

4.3.4.2 Discussion and negotiation

This aspect would concern contacting organizations and other relevant people to obtain the necessary information, consent, assistance and permission regarding the study. It also would involve discussing with them whether it would be possible to carry out the study there, negotiating my and their requirements for the research as well as establishing the starting date and duration of the research.

4.3.4.3 Explanation

During both the discussion and negotiation all those involved in the study would be provided with the relevant information concerning my background, the nature of the research, what the research wanted to achieve, how it would impact on the children and school and to what extent the participants would be involved.

4.3.4.4 Evaluation

The purpose of the above activities during the reconnaissance phase would be firstly, to examine and assess the context of the study for concerns, possibilities, opportunities and constraints and secondly, to devise a general plan for the research.

4.3.5. The general plan

After completing and assessing the reconnaissance phase which took eight months I decided, because of the time constraints, to use an action research process which consisted of three cycles. Each cycle would consist of three phases. Firstly, during the planning phase (P) all the influences, both positive and negative, proximal and distant, which affected the problem and which had been collected during either the reconnaissance or previous cycles, would be considered. Based on these experiences and sources of information, an approach would then be worked out for the cycle and then implemented (I). This implementation would be carefully monitored and reflected on throughout and on completion, evaluated (E) systematically. Conclusions would then be drawn and considered in the next cycle. In order to explore the emancipatory interests of the research the contextual, environmental and "political" influences impacting on the study would also be considered. At the end of each cycle the general plan would be assessed and revised as necessary.

I also decided that the introduction of the methodology would be incremental over the three cycles. In other words, I would first start with a few components of the cognitive teaching style and then add more, when and if necessary, as the cycles progressed. The quantity and particular aspects which would be added would be as a result of the experience gained in the reconnaissance phase or previous cycles. This is shown by the increasing size of the circles on the diagram of the model. Hopefully as the cycles progressed and more solutions were applied to the problem, it would diminish. This is shown by the decreasing size of the problem circles in the diagram of the model.

Apart from the educational progression I would also consciously try to apply the tenets of an emotional and psychological mediation approach. I would monitor and evaluate my and their emotional and psychological reactions to the classroom process and as the cycles progressed make necessary changes, adjustments and additions.

4.3.6 Data collection during the reconnaissance phase and the three cycles
4.3.6.1 Introductory remarks
Woods (1986) mentions that ethnographic studies are often accused of being impressionistic, subjective, biassed and idiosyncratic. However, when dealing with social knowledge we do not deal with absolutes either objectively or subjectively. Two issues arise out of this. Firstly, how

can external validity be achieved by ensuring generalizability and secondly, how can internal validity be attained so that what is found is genuine and not clouded by a personal interpretation or presence.

With regard to external validity two approaches can be used. On the one hand an idiographic course can be adopted whereby generalizability is not possible and what is "discovered" is descriptive and particular only to the situation being studied. Woods (1986) states that there are no "truths" to be discovered or "proofs" to be made: rather the aim is greater understanding of the social action in the situation under study. On the other hand generalizability can be achieved in ethnography by the use of a nomothetic approach whereby the study is spread over a wide base of operations. In terms of this study carrying it out in more than one school was not possible.

Internal validity can be strengthened in ethnographic studies through the use of triangulation. Cohen and Manion (1989) define triangulation narrowly as the use of two or more methods in the study of some aspect of human behaviour. However Denzin (1978) extends this methodological approach to include other types of triangulation.

- *Time triangulation* - This is achieved through longitudinal studies.
- *Space triangulation* - This is achieved by using different research settings.
- *Theoretical triangulation* - This is concerned with the use of competing and supporting theories in the investigation.
- *Investigator triangulation* - This refers to the use of more than one observer in the research setting.

To these I have added my own type of triangulation - *Data triangulation*. This refers to using different sources and types of data to support findings.

These forms all aim at convergence, reciprocal complementation or the correction of procedures and results (Denzin, 1978).

Using a multi-method approach for data gathering, has two advantages. Firstly, more than one method can reduce researcher bias and distortion which the exclusive use of a single method

might bring. If different and contrasting methods are used and yield substantially the same results, a reinforcement of the findings is experienced and reliability can be achieved. Secondly, it can overcome the problem of "method-boundness" where only certain familiar and preferred methods are used.

Cohen and Manion (1989) mention six occasions where triangulation is particularly appropriate:

- In settings where a more holistic view of educational outcomes is sought.
- In areas where different teaching methods are to be evaluated.
- In places where complex phenomenon requires elucidation.
- On occasions where controversial aspects of education need to be evaluated more fully.
- In areas where established approaches yield a limited and frequently distorted picture.
- In settings where case studies are undertaken.

In terms of my study I feel that the first five points above correspond closely with its nature and scope because it considers an holistic view of a new teaching method and psychological approach to learners in a complex and novel situation.

Cohen and Manion (1989) state that in deciding to use a multi-method triangulation approach three broad questions need to be answered:

1. Which methods should be used?
2. How should the methods chosen be combined?
3. How should the data be used?

With regard to the first question the kinds of information the researcher will require and what he will do with it, will determine the choice of methods. If general predictions are sought statistical methods will probably be more effective. Conversely, information representing more personal or phenomenological perspectives would need methods which concentrate more on process such as journals or interviews. Combined methods often break down traditional distinctions between normative and interpretive, and idiographic and nomothetic approaches (Cohen and Manion, 1989). The answer to the second question will be determined by the objective of the study, the specific situation and the relative weightings given to each method. With regard to question three, researchers will try to attach some kind of meaning on

quantifiable data, while with qualitative data they will attempt to draw meanings or explanations from the data themselves.

Internal validity can, therefore, be strengthened in qualitative, action research studies by the use of different forms of triangulation. In an attempt to achieve an acceptable measure of internal validity, I decided to concentrate on two forms of triangulation. Firstly, in terms of multi-method data collection, I would use some techniques which were reactive whereby participants would be required to respond to stimuli such as questions in an interview, questionnaire or achievement test. Other methods would be less obtrusive and require for example, the recording, at a later stage, of observations made during a lesson. The data collection methods would vary from oral and written to technological and, although predominantly qualitative, would also include some quantitative information where necessary.

To introduce investigator triangulation I proposed to triangulate lesson observations made while teaching and afterwards from video recordings, with another independent and competent observer. In this way different perspectives on the lessons would be gained. Through interviews and questionnaires I would also ascertain the views and experiences of other participants in and connected to the study.

Using these methods I would attempt to make sure that different perspectives influenced the analysis and the conclusions drawn from it. I include the methods chosen and the motivation for their choice below.

4.3.6.2 Teacher observation

Woods (1986) states that the central idea of participant observation is to penetrate the experiences of others within a group or institution. However, by becoming personally involved one acts on the environment and is acted upon by it. One needs to combine this deep personal involvement and commitment with a level of detachment. It requires the researcher to blend into the environment without identifying so strongly with it that a research perspective is lost.

Throughout the entire reconnaissance phase and the three cycles I decided to use the technique of overt observation. In other words, the house father of the shelter, principal, staff and learners would be aware of my purpose at the school and I would have their permission and approval to

carry out the research there. During the implementation of the reconnaissance stage and each of the cycles my role with the street children at the shelter, in the classroom and school would be twofold. Firstly, I would immerse myself as far as possible in their environment and life style at the shelter and their whole school environment. In so doing I would experience, observe and record all that happened. Secondly, as a teacher, I would teach the lessons and observe and record what took place on a psychological, educational and emotional level in the classroom. These observations would be used in part to write up my diaries each day and would be data triangulated with observations of the video recordings, questionnaires and interviews with others.

4.3.6.3 Interviews

As a method of verifying observations made, interviews can be very useful. In terms of research in schools there are a number of different forms the interviews can take. Hopkins (1985) states that school interviews can include those between:

> Teacher and pupil/s
>
> Observer and pupil/s
>
> Pupil and pupil
>
> Teacher and observer
>
> Teacher and other involved adults

For interviews to be effective a number of factors need to be considered:

The relationship between the interviewer and those being interviewed

For those being interviewed to share their feelings, experiences and thoughts freely, a relationship of trust, confidence, togetherness and a bond of friendship needs to be established between themselves and the interviewer. To achieve this the researcher needs to cultivate and display various qualities such as being understanding, non-judgmental, sensitive, sympathetic, fair and having a sense of curiosity. In order to attain the above relationship, especially in the teacher/child interviews, it is sometimes necessary to balance the power relationship between the two by stepping outside the teacher role during the interview.

The atmosphere of the interview

The interview should be characterised by an atmosphere of naturalness. To achieve this naturalness the interviewer needs to be as unobtrusive as possible and not to "suggest" or "lead" those being interviewed. The more voluntary the nature of the interview, the more chance there is of creating this naturalness and a sense of reciprocity. A less formal venue helps create an atmosphere which is more relaxed and less confrontational. However, it may be difficult to achieve a naturalistic and relatively democratic relationship with pupils who are a captive audience and perhaps have a language problem. A possible way around this problem could be to interview groups rather than individuals. This method has the advantage of putting individuals at ease, having individuals correct, add to and prompt each other, but also the disadvantage of certain individuals dominating or withdrawing (Kvale,1996).

In terms of this study interviews were planned with the house father of the children at the Doxa Deo shelter, the children themselves at the school and some of the past and current teachers teaching them. With regard to the interviews with the children concerning their perceptions and feelings about myself as a person and teacher as well as the teaching methods being used, I decided to ask Magdel, the school councillor, to carry out the interviews. I did this because of the close and trusting relationship she had established with the boys and to provide a situation where they would not feel intimidated or embarrassed by my presence or feel that they needed to give me the answers that they thought I wanted. Using her as the interviewer I believed would allow them to be more open, candid and honest.

4.3.6.4 Questionnaires

Questionnaires can be regarded as formalised and stylised interviews where the interviewer is removed and replaced by a structured transcript with responses missing. Hopkins (1985) says that questionnaires which ask specific questions about aspects of the classroom , curriculum or teaching methods are a quick and simple way of obtaining information from pupils. However, when dealing with street children who are unsophisticated and whose primary language is not that of the questionnaire, the composition, language and structuring of questions should be clear and uncomplicated. The usual five point scale should be reduced. According to Hopkins (1985) questionnaires, if designed well, are easy to administer, follow up and their data can be quantified if necessary. They do, however, require extensive preparation to get clear, unambiguous and relevant questions. It is also difficult to develop questions which explore

issues in depth. Their effectiveness also depends on the ability of the children to read and comprehend what they have read. Sometimes children may be frightened to answer honestly and candidly and may try to produce the "correct" answers. In applying the questionnaires with the children I realised that they would need practical assistance I would probably have to guide them through the questions verbally.

In the study I planned to administer questionnaires to the children and the teachers at the school. With regard to the children the purpose would be to collect background information, to establish what kind of school and classroom atmosphere and environment they sort, how they wished to be treated by teachers and their peers, the applicability and effectiveness of the cognitive teaching style model and on myself as a person and teacher. In terms of the teachers I wanted to discover what their observations, experiences and perceptions of teaching street children were. These I could triangulate with my own.

4.3.6.5 Video recordings of all lessons

Hopkins (1985) says that the video recorder in classroom research, can be used in at least three ways. Firstly, it is useful in obtaining visual and aural material on the total teaching situation. Secondly, it can be used to concentrate on specific teaching incidents and thirdly, as an aid to diagnosis. It also has the advantage of enabling the researcher to review events and situations again and again. In this way the origins of problems can be diagnosed, the effects of innovations observed and behavioural and relationship patterns between pupils and teachers and pupils and pupils established. Hopkins (1985) is also of the opinion that the video camera, if conspicuous, can be intimidating and distracting to pupils. However this factor can be neutralised by introducing the camera into the class sometime before the beginning of the research and by familiarising the pupils with it. The novelty of its presence soon wears off. The camera needs to be positioned strategically so that it records what is required.

During the study I decided to record all planned lessons on video tape. These would be used for later observation, analysis and evaluation by myself and another competent triangulator.

4.3.6.6 Recordings in a researcher's diary

Keeping a diary on a regular basis is a way of recording observations, reflections and reactions

to people, places and events. In this way a record is obtained on three levels - what one experiences, thinks and feels. Hopkins (1985) mentions that information can be "issue related" whereby the focus is on particular incidents or general impressions of the school, classroom, their climate, environment, relationships or incidental events.

The diary is an uncomplicated way of collecting on-going information and in so doing provide continuity. It provides opportunities for the researcher to revisit events and situations conveniently, it can help to connect related incidents and help to expose emerging trends. It is advisable when writing the diary, to make use of other sources of data such as video recordings, audio tapes and transcripts. Triangulation with these sources will contribute to the validity of the writing. During this study I decided to use two types of diaries. The first was a combined diary written during the reconnaissance phase in collaboration with Magdel. During this time both of us were simultaneously exploring and delving into the mysterious world of street children taken off the street and housed in a shelter. On returning from our two day a week visits we would take time to discuss and swap ideas concerning our experiences, observations, emotions and thoughts. Then we would write up our diaries independently. The second type of diary was a personal one written privately. This diary began when I started teaching at the school established for street children and other children at risk. I wrote the field notes for this diary in a book I kept open on my desk each day and in which I jotted down incidents, interactions, reflections, observations and significant events as soon after their occurrence as possible. On arrival at home I reviewed and reflected on these notes, watched the video recorded lesson if I had taught one, studied any other data source that had been completed that day and then used all these sources to write my diary.

It is important for the time lapse between the experiences of the day and the recording of them in the diary, to be as short as possible. The greater the time between the two, the more difficult it is to retain a conscious awareness of one's thoughts at the time of the events so that an accurate reconstruction can be captured. This is why I decided to record my observations in my diary each day. In terms of this study much of the success of the research would depend on the honesty, accuracy, and strength of the material written into my diary.

The keeping of a comprehensive diary on a regular and ongoing basis takes personal discipline,

is time consuming and can lend itself to the possibility of being subjective.

4.3.6.7 Lesson evaluation and triangulation of the lessons

Apart from observing the lessons while I was teaching them, I decided to apply a dipstick type evaluation of the formal teaching style, teacher/learner relationships and classroom atmosphere at three discreet points along the study - once in each of the three cycles. The evaluators in each case would be myself and another independent and competent observer. The purpose of these observations and evaluations would be to compare the teaching style, classroom atmosphere and teacher/learner relationship observed with that of the model being introduced and to triangulate the findings.

In order to evaluate how closely the lesson fitted the cognitive teaching style model described in chapter three, I developed a classroom observation schedule. I adapted this schedule from the Key Indicator Study Observational Schedule (Moonsammy, Van der Westhuizen and Abrahams, 1994) which had been communally developed by the CCD staff and which was used as a research instrument for assessing whether teachers had transferred the CCD's cognitive teaching style into their classroom practice.

The instrument had three sections and covered the following areas:

Section A: **Teaching practice and the deliberate teaching for thinking.**

        Part 1 - Cognitive questioning

        Part 2 - Teacher feedback

        Part 3 - Cooperative learning

        Part 4 -   The role of language in learning

        Part 5 -   The use of learning aids and text

Section B: **Learner behaviour**

Section C: **The relationship between the teacher and learner**

Each of the above sections contained a number of positive statements. I assumed that each statement represented a desirable and observable aspect with regard to the cognitive teaching style. I provide an example below.

CLASSROOM OBSERVATIONAL SCHEDULE

Part 1: Teaching practice -   Deliberate teaching for thinking

	VE	E	SE	A
a. The teacher's questioning style encourages	....			
confidence in the pupils.	....			
b. The teacher's questioning encourages	....			
the pupils to participate in the learning.	....			

I also assumed that the greater the degree that these aspects were present or evident in the lesson, the closer the lesson was to the model. Secondly, a four point rating scale with the following categories appeared next to each statement. Numerical values were allocated to each category as follows:

Very evident (VE)	3
Evident (E)	2
Slightly evident (SE)	1
Absent (A)	0

By evident was meant recognisable, present, observable, noticeable and visible. All concepts used in the schedule were defined and explained. After each statement had been scored, the values were totalled and converted to a percentage. It was then assumed that a high percentage value would represent a lesson which strongly represented the cognitive teaching style model and a low percentage the reverse. An example of this observation schedule can be found as Attachment 4A in the Appendix.

As mentioned I decided to use this schedule in a number of other strategic places throughout the study. I selected random lessons in each cycle and after reviewing the lessons on the video recording, evaluated them against the model using the instrument. This was to see how close the match was between my lessons and the teaching style of the model.

In an attempt to overcome the subjectivity of my own observations with regard to the above lessons and to build in an element of validity, I used the process of triangulation as outlined

earlier in this chapter. An experienced independent observer watched all the above random videos and scored them on her own using the schedule. In relating the lessons to the cognitive teaching style model I averaged our scores.

4.3.6.8 Written achievement tests for the pupils

Kerlinger (1986) mentions that achievement tests can be used to measure present proficiency, mastery, and understanding of general and specific areas of knowledge. They are also measures of the effectiveness of instruction and learning. There are two types of achievement tests - standardised and specially constructed tests. Standardised tests are professionally constructed, cover general educational content and are quite reliable and generally valid. Specially constructed tests are usually teacher-made and are used to measure more limited and specific achievements such as concept understanding of a specific content area or the recall of factual knowledge. In terms of this study written tests set and conducted by me after each cycle would be used as well. Examinations written in June and November would also provide additional data on academic performance.

4.3.6.9 Psychometric tests

On arrival at the school in 2002 the children were placed in grades according to their previous history and from information received from other educational institutions they had attended. Some who had come directly off the street were tentatively placed in grades of their choice. However it was obvious from initial interactions with them during the reconnaissance phase at the shelter and at the beginning of the year at the school that their actual academic abilities especially in both English and Mathematics did not seem to match or correspond to the grades in which they had been placed. The initial impression was that they were far lower. Before embarking therefore on any teaching strategy I decided it would be useful to obtain some baseline proficiency levels in literacy, numeracy and also gain some insight into their individual learning potential. In order to obtain this information we approached the Industrial Psychology Department at UNISA. They kindly agreed to test the children in these three areas. Their report includes the following motivations for the tests used. (UNISA assessment, 2002)

Assessment of numerical proficiency or numerical literacy was included to provide information on how proficient the children were with mathematical calculations needed in everyday life.

English proficiency was also tested for the middle and higher grade groups because proficiency in language often impacts on learning especially when the medium of instruction is not the first language of the learner. English ability, if English is the medium of instruction, has generally been found to be an important predictor of academic performance. Inadequate language proficiency could prevent the realization of ability into commensurate levels of academic performance (UNISA assessment, 2002). Finally present and future learning potential was assessed. The tests used for the different grades were:

Grade 7:

English and Mathematics: Junior Scholastic Proficiency Battery (JSPB)

This test measures the effectiveness with which a pupil has utilized his aptitudes and learning opportunities for obtaining proficiency in certain scholastic fields of study. The two sub-tests that were used were English- Second Language and Mathematics. In the English - Second Language test the learner's vocabulary, ability to spell, language usage and correct use of punctuation are regarded as valid indications of his proficiency in English. For the Mathematics sub-test the child's ability to manipulate and solve mathematical problems is considered to be valid indication of Mathematical ability. The reliability and valid indexes for the JSPB are of an acceptable level, however some questions can be asked with regard to these factors when the test is applied to disadvantaged learners.

Learning Potential:

The learning potential test used was the LPCAT (Learning Potential Computerised Adaptive Test). This test provides an indication of children's present level of general non-verbal figural reasoning performance as well as their future potential level of performance. The test was developed specifically for South African conditions and does not depend on language proficiency or prior learning opportunities. In order to make the test more culture fair, to minimize the effects of the substantial language diversity and variance in socio-economic and educational opportunities, the test makes use of non-verbal figural content. It is done on a computer using two keys - space bar and enter keys. In a further attempt to improve the culture fairness it has been constructed as a power and not a speed test. There is therefore no overall time limit to the test.

Grade 8,9 and 10:

Numerical Literacy:

The test used was the Basic Numerical Literacy. It is a multiple-choice test that covers the basic knowledge and comprehension of numbers as well as the application of basic numerical knowledge and concepts.

English:

English proficiency scores were obtained by using the Proficiency Test - English Second Language (Intermediate Level). This test is used to ascertain the learners' knowledge and skill regarding a defined field of experience or subject matter not attached to a specific syllabus. The contents of the test include only tasks which fall into the capabilities of Second Language English learners at a junior high level i.e. Grade 7 to 9. The test determines the learners' knowledge and skill in language that is not solely attained as a result of curricular activities but also from extra-curricular English contact and use.

Learning potential:

The LPCAT was also used for these grades.

4.3.6.10 Miscellaneous documents:

Often during the course of the research cycles spontaneous documents arise. These are as a result of on the spot decisions or unpredictable or unplanned events. In this category fall the spontaneous tribute one of the children wrote for me, class rules that we developed at the beginning of the year, stories that were written for me by students and the expulsion motivation that was written for four children towards the end of cycle three. Other miscellaneous documents which provided useful information throughout the year were attendance registers and the learner's individual and group worksheets.

4.3.6.11 Conclusion:

Table 4.1 provides a summary of the different data gathering methods used during the reconnaissance phase and the three cycles.

Data source	Reconnaissance	Cycle 1	Cycle 2	Cycle 3
1. Combined diary	X			
2. Personal diary		X	X	X
3. Learner's questionnaires		X	X	X
4. Learner interviews			X	

5. Teacher questionnaires	X		X	X
6. Lesson evaluation and triangulation		X	X	X
7. Cycle achievement tests		X	X	X
8. Examinations			X	X
9. Video tape analysis		X	X	X
10. Psychometric tests	X			
11. Miscellaneous documents	X	X	X	X

Table 4.1. Data gathering sources

4.3.7   DATA ANALYSIS

4.3.7.1 The process of data analysis

Data analysis according to Miles and Huberman (1984) contains three sub-processes. Firstly, data reduction involves reducing and condensing the mass of data in an anticipatory way while keeping the research question and conceptual framework in mind. Secondly, data display is an organised, compressed gathering of information that allows conclusions to be drawn. This reduced set of data is used as a basis for finding meaning. Thirdly, the drawing of conclusions and verification involves the researcher in interpretation and the drawing of meaning from the data. These three processes happen before data collection when study design and planning are being done, during data collection as an interim and early analysis and after data collection to draw conclusions.

Qualitative analysis allows for interim analysis and requires different types of inquiry at different points in the research. The collection and analysis of data takes place throughout the study. This has the advantage of allowing adjustments and correcting mistakes as the research progresses. However, there are disadvantages as well. Data needs to be condensed at the same time as more is being collected. As the study progresses data collection needs to concentrate on the emerging categories and themes. After the initial reduction of data has occurred, Miles and Huberman (1984) put forward a set of "tactics" for making meaning of the information. These tactics I have included in Table 4.2.

NO	DESCRIPTION	EXPLANATION
1.	Noting patterns and themes.	
2.	Seeing plausibility.	Making intuitive sense.
3.	Clustering.	Conceptual grouping.
4.	Making metaphors.	Figurative grouping of data.
5.	Counting.	Seeing "what's there."
6.	Making comparisons.	Clustering and distinguishing observations.
7.	Partitioning variables.	Unbundling variables.
8.	Subsuming particulars into more general categories.	
9.	Noting relations between variables.	
10.	Building a logical chain of evidence.	Assembling a coherent understanding.

Table 4.2   Tactics for making meaning of data - modified after Miles and Huberman, 1984.

When analysing information two levels of understanding are encountered. Firstly, there is the descriptive level where the questions of what is happening and how events are progressing are answered. The second level deals with reasons and explanations - the why questions. Why questions focus on causality. Miles and Huberman (1984) maintain that qualitative research, because of its nature, is well suited to finding causal relationships.

4.3.7.2 The data analysis process used in this study

The process of trying to make meaning and sense of a wide range and quantity of data is a daunting task. I realised that I would have fifteen and three quarter hours of analysed video recordings, 140 pages of diary, transcribed interviews, questionnaires from pupils and teachers, results from written tests and examinations, completed triangulation observation schedules, results of psychometric tests and other spontaneous and miscellaneous documents to process and analyse. How was I to make sense of this mass of information in terms of the research questions I had asked? In broad terms I decided to make use of both an inductive and deductive approach. Inductive to arrive at regularities and categories, and deductive to verify and find evidence for them.

In order to structure the analysis of the data, I constructed a data analysis table. (Table 4.3). It

includes three levels of formality in the analysis, the stages in the analysis that they represent, and the activities that inform them. It must be stated that these levels, stages and activities often occur concurrently and therefore do not follow each other sequentially. For example, while reflecting later on a lesson I had taught at school, I would also be busy transcribing interviews, analysing achievement tests and starting to code my diary.

Level one - Initial impressions on reflection

In the process of carrying out primary activities such as teaching and data gathering processes such as interviewing, reviewing video recorded lessons and completing questionnaires and writing my diary in the evenings, I would have to function on two levels. Part of me would be concerned with carrying out the function. At a second level I would be involved in metacognitive analytical thoughts about what was occurring in front of me while I was busy with the task. For example, while busy with the cognitive questioning process during a lesson I could also reflect on the ability of the pupils to answer and the relationship that was developing between the learner's and me.

Level	Stages in the analysis	Activities in the analysis
1	Initial impressions on reflection.	Interviewing Reading through completed questionnaires Teaching and testing Viewing video recordings Writing my diary Reading documents Observing psychometric testing

2	Secondary impressions when reflecting on and reviewing the processing of data sources.	Transcribing interviews
		Summarising and processing questionnaires
		Summarising triangulated lesson observation schedules
		Reflecting on and analysing documents
		Marking and summarising achievement tests and examination results
		Transcribing lesson processes and observations from video recordings
		Analysing psychometric testing results
		Reviewing learners' worksheets
3	Formal thematic analysis	Study of raw data
		Coding of raw data
		Listing of categories
		Comparing and clustering of categories
		Noting relations between categories
		Unbundling of categories
		Subsuming of categories
		Building logical chain of evidence
		Linking understanding to the research question

Table 4.3.   Summary of data analysis process

Even at this early stage I decided to compile a list of recurring observations, key events, preliminary regularities, emerging categories and tentative themes within categories.

Level two - secondary impressions while reflecting on and reviewing data processing

In order to display, access and later collate the data, it would be necessary, in most cases, to change the mode in which it had been captured. For instance tape recorded interviews would need to be transcribed so that they could be studied in detail.

In the case of the video recorded lessons it would be necessary to capture the process of the lessons and my reflections and observations with regard to them, systematically. Reference information connected to these activities would also need to be collected. To capture the flow

of the lessons, my comments and observations and the reference information on the tape, I decided to use a standard written format like the one I included as Attachment 4B in the Appendix. This would be done to standardise the observation and reflective process and to display the data in a form I could use later for further analysis. In column one I would record the flow and process of the lesson. In column two I would attempt firstly, to capture critical events happening in the lesson and secondly, my reflective comments on them. Column three would reflect and serve as a reference.

Before further analysis and interpretation could be undertaken most of the other data sources would have to be converted into a form where they could be displayed. Therefore, the instruments used would have to be analysed, processed and the findings summarised in the most useful way. I include this process below.

Pupil questionnaires

Demographic information:

These questionnaires which were completed by the learners in cycle one provided information with regard to name, age, grade at school, where they stayed, where their home was, the size of their family, what national group they belonged to, what their career aspirations were and how long they had been on the street. Responses were grouped into categories and counts made so that trends could be discovered.

Questionnaire 1:

The two open questions on this questionnaire were designed to establish what kind of school and class environment and atmosphere the learners wanted. It also dealt with how they would like to be treated by the teachers and peers. Categories were established and counts made.

Questionnaires 2 and 3:

After the students had completed questionnaires two and three with regard to the cognitive teaching style, I decided to summarise the information. To obtain an overall picture of the students' responses to the first eight or ten fixed selection questions, I planned to construct a table. The responses of each student would be recorded horizontally and the total number of response per question calculated vertically. The questions chosen were designed to obtain information in the following areas. Firstly, general comments regarding the lesson (Questions

1,2,3), secondly, how they responded to the level of English being used (Question 4) and thirdly, how they had experienced various aspects of the cognitive teaching style model (Questions 5 to 10). I planned to use the aggregate responses to each question as an indication of how the class as a whole had experienced these areas. A copy of this table can be found as Attachment 4C in the Appendix.

I planned to apply a thematic analysis and a word count to the two open questions regarding what they liked and disliked about me as a teacher and thought about the lessons. When doing the thematic analysis I would first read through the replies carefully, identify, label and then colour code emerging categories. Later I would draw up a frequency table of the categories. This would show where the weight of the pupils' opinions lay. I hoped that the word count would provide some information with regard to the pupils' ability to write English and their confidence and willingness to do so. I also hoped that the themes emerging from the open questions would support or refute the first ten fixed selection questions. A copy of this table can be found as Attachment 4D in the Appendix.

The lesson observation instruments

As mentioned, I planned to complete lesson observation schedules by myself and an independent triangulator on three different occasions - one for each of the cycles. In order to collate the two scores I decided to use a summary table I designed the table to show the scores of the triangulator and myself separately and the average score of both. A copy of the summary of these lesson observation scores can be found as the Annexure 4E in the Appendix.

The table would also record the scores for each part of a section and the total scores for all the sections. Finally a total score for the lesson would be calculated. In order to make the different scores comparable each would be converted to a percentage. The purpose of the display of data in this form was firstly, to obtain a match of the observed lesson with the cognitive teaching style model and secondly, a breakdown with regard to its different aspects. A copy of this table can be found as Attachment 6 in the Appendix.

Marking and summarising achievement tests

After marking the tests at home or in the presence of the pupils I converted them into

percentages and established an average percentage for the class and the range.

Reflecting on documents

If any spontaneous documents relating to the study, such as letters or reports, became available they would be analysed in a thematic way. Again the processing of these sources of data took place at two levels. On an operational level, they were transcribed, read, summarised and calculations were done if needed. However on a metacognitive level, what was revealed by them, was monitored, reflected and commented on. These secondary impressions were used to modify and add to the list of emerging regularities, categories and themes.

Level three - Formal thematic analysis

After the completion of the reconnaissance and each cycle I would embark on a formal thematic analysis of the information I had collected and displayed. In doing this I was influenced by the work of Ely (1991) and Miles and Huberman (1984). The combined process that I worked out for myself was as follows:

1. *Study all forms of the raw data intensely to develop an intimate and detailed knowledge of it.*

This involved reading carefully through my diary, the lesson observations, the transcribed interviews, the summary of the pupil questionnaires, the summaries of the lesson observation schedules, the written test results and other less regular data sources such as the miscellaneous documents.

2. *Note and record the initial impressions from the data sources*

I would start this process by re-reading the diaries. As I read through them I would begin to code them by colour coding paragraphs. For instance, if the paragraph was concerned with the problem of pupils not being able to respond to cognitive questioning because of a lack of vocabulary, I would write "language issue" in the margin. If however, the piece was about the discipline in the school, I would record "contextual issue" on the side. If it was an emotional or psychological issue this would be noted. From these notes in the margin of the diaries, regularities, key issues and repeated observations would begin to emerge. It was from these that categories would arise. As these categories began to repeat themselves, I would colour code them and record them in a list as potential final categories.

The next step would be to work through the lesson summaries for the cycle in the same way as the diary, colour coding the sections and events concerned with categories. During this process the categories I had found in the diary would be confirmed and new ones would also emerge. As I worked through the lessons I would mark incidents as evidence and support for the categories I had found in my diary and the lesson summaries. The new categories would be colour coded and added to the growing list. Following on this I planned to study the transcripts of the interviews, and the summaries of the questionnaires in the same way for further evidence of existing categories, for new categories and for evidence that would discount existing categories. Old and new categories would be colour coded. This tactic can be found as number four in Table 4.2.

3. *Listing categories*

Using the above method I would work through all the descriptive data and establish a list of all the categories emerging from the different data sources. I believed that the list of categories would grow and change as I moved through the reconnaissance and each of the cycles. This would be due to the changes I had made to the existing methodology, because of any new additions made to it and because of new interpersonal strategies I had used with the learners. On revisiting the categories and looking for themes within them, and later working with the interpretation of them, it might be necessary to collapse some of the categories. This tactic can be found as number 8 in Table 4.2. This occurred, for instance, when I brought the relationship between the teacher and the pupils and the category dealing with student behaviour together, and when I joined the importance of the concrete stage of conceptual learning with cognitive questioning.

4. *Collating the different data sources under the categories*

At this point, apart from an overarching mental interlinking of the data sources that I had done, each source had been analysed independently. Before any interpretation could be done it would be necessary to collate the different data sources under the various categories.

An important aspect of qualitative research is that of trustworthiness or validity. Ely (1991) says the researcher needs to ask if the process of the research has been carried out fairly, and does the product of the research represent as closely as possible the experiences of those involved in it. As mentioned, in striving for validity the concept of triangulation is significant.

The triangulation of data depends on the convergence of information gathered by different methods. The following diagram (Figure 4.2) from

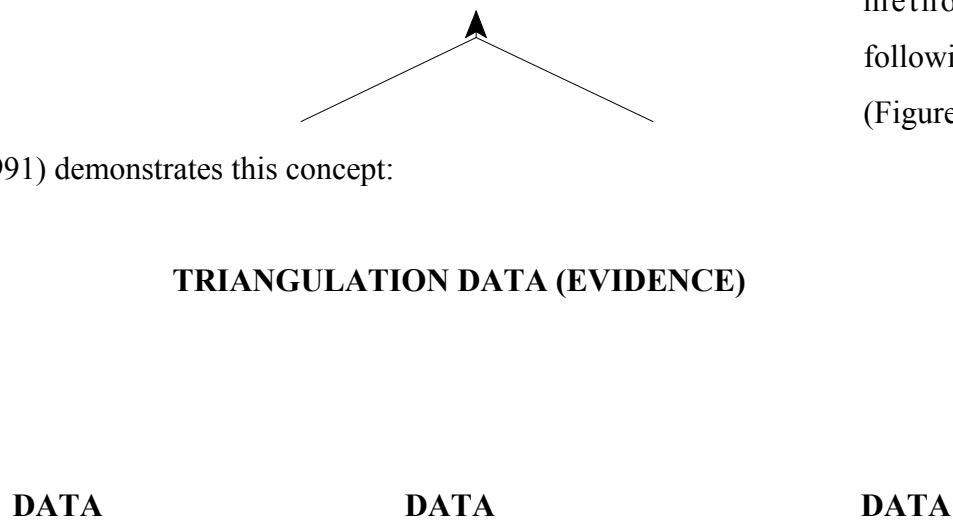Ely (1991) demonstrates this concept:

TRIANGULATION DATA (EVIDENCE)

DATA   **DATA**   **DATA**

Figure 4.2. Triangulation of data

In order to increase the validity it was also important to strive for evaluator triangulation as shown in Figure 4.3.
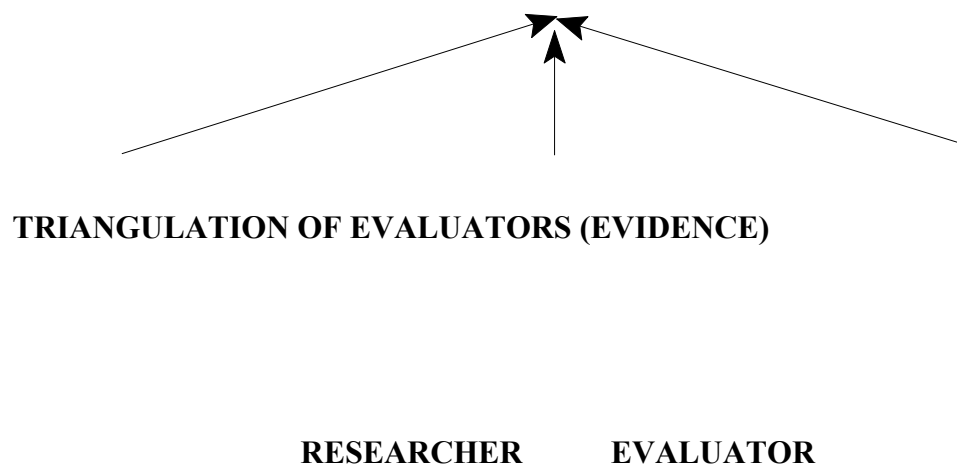
TRIANGULATION OF EVALUATORS (EVIDENCE)
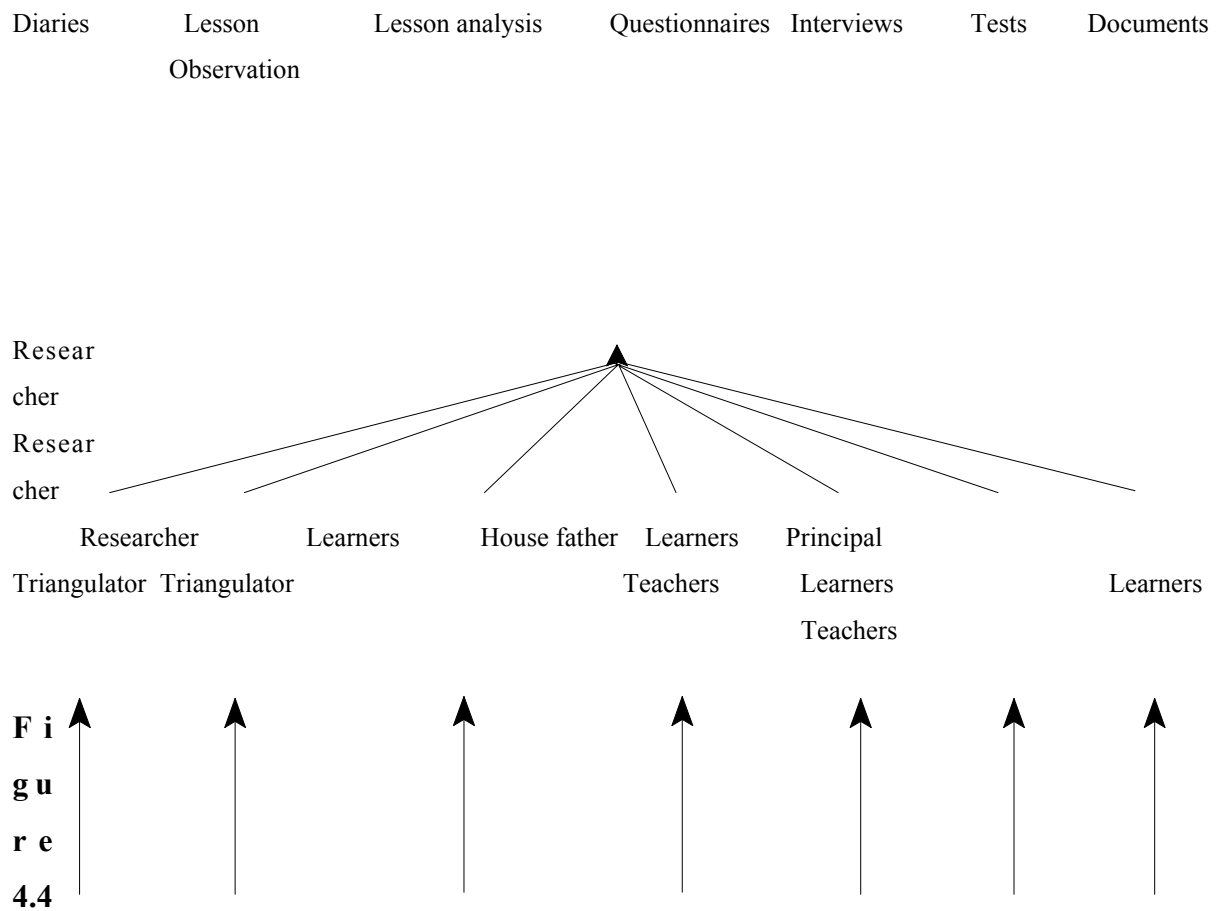
RESEARCHER   EVALUATOR

Figure 4.3. Triangulation of evaluators

In terms of this study it was therefore necessary, in order to achieve a level of validity, to triangulate as many different types of information from as many sources as possible. The

triangulation for category evidence for this study is captured in Figure 4.4.

CATEGORY EVIDENCE

Diaries   Lesson   Lesson analysis   Questionnaires Interviews   Tests   Documents
                 Observation

Resear
cher
Resear
cher
       Researcher   Learners   House father   Learners   Principal
Triangulator Triangulator   Teachers   Learners   Learners
                                                                        Teachers

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. Category evidence of study

In this figure data triangulation is achieved horizontally with the different data sources and

evaluator triangulation for each data source vertically.

In order to achieve this triangulation it would first be necessary to collate the different data sources under one category. I would begin this process with the two largest sources of data namely my diary and the lesson observations. Using the notes in the margins and the colour codes in both these documents I would collect all the data concerned with one category.

To these two sources was added the relevant, colour coded category information from the interviews, the questionnaires and the written tests as well as from unexpected sources of information such as the miscellaneous documents.

5. *Searching for sub-themes within categories*

The next stage of the analysis process would be to take the collated evidence for each category and study it for sub-themes within the category. This I would do by reading through the collations and listing themes with supporting evidence and data references. As an example I include the list I created during cycle one with regard to the category of language.

The language category - Cycle one

1. The subject knowledge and therefore the specific Scientific English ability of the teacher. The use of the word "rotate" when describing the effect of a force on a toy windmill (Lesson observation, Lesson 3, Tape 3).

2. The general English language ability of the teacher. Having to translate "exert" or "acts on" downwards to "pulls or pushes" or "does something to" (Diary, 2002:04:16, p.16).

3. The ability of the pupils, when listening, to understand the English of the teacher. The difficulty pupils experienced when discussing friction (Lesson observation, Lesson 6, Tape 6).

4. The ability of the pupils to use English to formulate answers to questions and express their understanding. Difficulty in explaining how brakes work on a bicycle (Lesson observation Lesson 4, tape 4 or the concept of gravity Lesson observation, Lesson 4, Tape 4).

5. The ability of the learners to translate verbal ideas into written ones. Sentences were contracted and often words left out (Diary, 2002:04:16, p 16].

It was after these five steps were complete that I was able to begin the process of writing down my interpretations of the analysis.

4.3.8 Conclusion

This then was the action research design which finally formed the basis of the study. It was used to see if aspects of the cognitive teaching style were applicable and suitable when teaching street children and what psychological and emotional issues were pertinent when interacting with them in a formal classroom setting. The basic design was developed before the start of the reconnaissance but was adapted and refined as the process unfolded and as I was faced with realities I had not and could not have anticipated beforehand.