

## CHAPTER 1

### ASSESSING THINKING FOR LEARNING - IMPLICATIONS FOR RURAL SOUTH AFRICA

#### 1.1 INTRODUCTION

Rural Zulu-speaking children are constantly faced with problems of daily life, and successfully resolve these problems through the application of the appropriate linguistic and cognitive skills required of such experiences. Yet, when they are faced with problem solving within the context of formal learning, the high failure and drop-out rate indicate that they are not able to apply the appropriate problem solving skills which would ensure success in this context (Macdonald and Bourroughs, 1991)

School success is directly related to adequate language (Cummins, 1985), thinking skills and problem solving ability (Blank, 1970; Zachman, Jorgenson, Huisingsh, and Barret, 1984). This is endorsed in The White Paper on Education and Training which states that education, including curriculum, teaching methods and text books, should “encourage independent and critical thought, the capacity to question, enquire, reason, weigh evidence and form judgements, achieve understanding ... and communicate clearly” (White Paper WPJ/1995, chap 4). In the past, tests aimed at evaluating thinking skills in children, have demanded of the child an ability to understand the problem and then demonstrate this by manipulating an object (Piaget and Inhelder, 1968), indicating a response (Piaget and Inhelder, 1968; Donaldson, 1986), or making an analogous judgement (Chen and Siegler, 2000).

However when a child is requested to verbalize the response to the problem situation, we are given the opportunity to understand whether the child is able to organize and manipulate language sufficiently, to express thoughts or ideas at different levels of complexity. This expression may be related to concrete objects and events immediately present, or to ideas and concepts, giving rise to the presence of true cognitive skill. It provides evidence that children are able to demonstrate ‘domain free reasoning processes’ in which the child activates cognitive

processes irrespective of the actual context of the material at hand (Roberts and Stevenson, 1996).

It must be acknowledged that what we witness here, is far more complex than the integration of thought and language alone. It is the culmination of: the child's individual ability; the outcome of the learning opportunities provided by that child's environment; the social and cultural norms surrounding the child; socio-economic reality and consequent nutritional status and the quality and effects of the education the child has received to that point in his/her life. However, despite this, being able to integrate language and thought, or to encode communication, has been shown to be more significantly related to general cognitive ability than to other factors such as age and socio-economic status (Quay, Hough, Mathews and Jarret, 1980).

The school system as we know it, demands of the child an ability to progress from using language primarily as a communication tool, to using language as the primary means of acquiring knowledge. This is achieved through literacy experience (Heath, 1992). Research has shown, that if children in primary school phase and beyond, are to cope adequately with written language - language in its most context reduced and cognitively demanding form, a second stage of language development, and development of associated cognitive skills, must occur (Crais and Lorch, 1994). It is through re-organizing and reformulating the linguistic structures already present in the child's language, both at a micro- and macro-structure level, that this is made possible (Westby, 1982). This will provide children with the ability to reason and express causality, to make inferences, to devise solutions to problems, to anticipate problems and find ways to avoid them.

In view of the fact that problem solving in the formal school context is problematic for rural African children, we must seek to understand problem solving skills through a different context. Social or pragmatic reasoning has been shown to form the basis of abstract logico-deductive reasoning to follow (Hertzog, Birch, Thomas & Mendez, 1986; Vygotsky, 1962). It is therefore, within social reasoning that rural Zulu-speaking children may have a better opportunity to demonstrate their ability to reason and explain.

Through analysing verbal responses to everyday problems presented by primary school children, in which specific thinking skills are targeted, evidence for the development of the second stage of



language and thinking skills may emerge. Understanding these processes will enable us to identify the extent to which such skills are present in children of different ages in the primary school phase, during which the foundation for all subsequent learning is laid. Further, the importance of second stage language and thinking skills in contributing to progress in school may be highlighted. Ability to reason and create causal ties not only facilitates the ability to extract from memory in order to create a new causal representation, it also facilitates the ability to create causal connectives within text for independent learning practice.

The first step towards such an understanding, is the development of a 'non-biased' assessment tool that will enable us to accurately evaluate language and problem solving skills upon which academic success depend. In light of the current controversies over the use of inappropriate tests when evaluating children in a cross-cultural context (Taylor, 1986b), development of a test to evaluate language and thinking requires significant consideration of the profound influence of culture and social circumstances on the development of these skills.

This research study attempts to produce an instrument, which will form this first step towards understanding how rural African children think and solve problems, and verbally express this process. A serious attempt has been made to take as many aspects of culture and social circumstance as possible into consideration, thereby making the test as culture fair as possible. Through using the Test of Problem Solving (Zachman, Jorgenson, Huisingh, and Barret, 1984) as a basic model, the Test of Ability To Explain for Zulu-speaking Children (TATE-ZC), was produced.

For thousands of rural Zulu-speaking children, as well as the thousands of rural children throughout South Africa, academic achievement is threatened. Due to minimal exposure to any form of pre-literacy or pre-school experience (Liddel, Kvasvig, Shabalala and Quotyana, 1994), these children, like other socially disadvantaged children throughout the world (Blank, 1970), are at risk for entering school with a language system inadequate for the demands of literacy and learning. Being able to effectively evaluate this may provide the first step towards an intervention process that could affect the education of thousands of children.

The Test of Ability to Explain for Zulu-speaking Children (TATE-ZC) is a test designed for a rural Zulu culture and presented in Zulu. It provides speech-language therapists, psychologists

and educationists in South Africa with a unique tool, as it is a test designed specifically for a significantly large group of children in this country, for whom we have minimal assessment tools.

## 1.2 CLARIFICATION OF TERMINOLOGY

- **Abstract thinking skills:**

Thinking skills used to solve problems which occur in the absence of any concrete stimuli, or thinking that goes beyond a given stimulus, drawing on world knowledge, previous life experience or formally learned information.

- **Cognitive style:**

It is the manner in which each individual perceives, organizes, processes and expresses personal experience

- **Cognitive skill:**

It is the product of intellectual development

- **Concrete thinking skills:**

These are thinking skills which occur in the presence of a concrete stimulus or in response to a stimulus e.g. a picture, in which all the evidence is present.

- **Cross-cultural multi-lingual setting:**

A setting in which testing takes place where the tester and subjects are not of the same culture or language.

- **Culture:**

Culture is represented by the beliefs, values, behaviours, institutions and language of a group of people.

- **Disadvantage:**

This refers to an enduring state for certain individuals, whose background, attitudes and general capabilities have failed to equip them adequately to cope with life's opportunities.

- **Deductive explanation:**

An explanation based on logical reasoning.

- **Empirical explanation:**

An explanation based on observable evidence.

- **Explanation:**

It is the verbal response and solution which reflects how an individual has applied thinking skills to a problem presented.

- **Intentional explanation:**

An explanation based on a psychological motivation, desire or an achievement of a goal.

- **Literacy Experience:**

This is any experience related to literacy in the form of reading or writing. It may take the form of exposure to books, hearing stories or actually reading. It may take the form of pre-writing skills such as pencil and paper tasks, drawing or writing.

- **Linguistic skill:**

The ability to use the grammar and vocabulary of a language accurately.

- **Non-biased assessment:**

An assessment in which culture and language of the individual, do not impact negatively on the results.

- **Non-mainstream:**

A non-dominant group of individuals who are culturally or socio-economically different to the dominant western middle-class and often Standard English speaking group, on which tests are usually standardized.

- **Problem solving:**

It is the process whereby we reconcile something new with something known. It requires the ability to formulate what is known, to hypothesize about various solutions, to select the appropriate answer, and collect, integrate and evaluate this new knowledge. It is achieved through applying thinking skills.

- **Second stage language development:**

This refers to the development of language beyond the initial developmental processes, which give rise to metalinguistic skills, narrative ability and reasoning. It occurs in response to exposure to literacy.

- **Social or Pragmatic reasoning:**

It is the ability to analyze, think logically and understand the causal relationships within this context of a social situation.

### 1.3 ABBREVIATIONS

- **BICS:** Basic Interpersonal Communication Skills
- **CALP:** Cognitive/ Academic Language Proficiency
- **RA:** Research assistant
- **TATE-ZC:** Test of Ability to Explain for Zulu-speaking children
- **TOPS:** Test of problem solving



- **ZS:** Zulu-speaking

Abbreviations used for the analysis of thinking skills:

- **AP:** Avoiding the problem
- **DC:** Determining the cause
- **DS:** Determining the solution
- **EI:** Explaining Inferences
- **NW:** Negative why questions

#### 1.4 BRIEF OUTLINE OF CHAPTERS

Chapter 1 deals with the background and motivation for the study, and the context for the research problem. Chapter 2 deals with the theoretical issues related to language, cognition and problem solving skills, and the influence of culture and disadvantage on these central concepts. Chapter 3 deals with theoretical issues related to cross-cultural evaluation, and development of 'non-biased' test material. Chapter 4 deals with the methodological procedures applied in the development of the test instrument as well as to the procedures for the main study. It also describes the analysis of the data. Chapter 5 deals with the presentation of results from the main study and discussion of these results where appropriate. Chapter 6 deals with the integration of the results, discussion on relevant issues relates to this research, limitations of the study and recommendations for further research. Chapter 7 concludes the discussion by re-visiting three essential questions.

## 1.5 SUMMARY

Chapter 1 provides the context, motivation and background to the study. The issue of adequate language, thinking skills and problem solving ability for academic success was stressed. Focus was placed on the lack of 'non-biased' test material for rural Zulu-speaking children. The value of a test instrument such as the TATE-ZC as the first step towards effective intervention was noted. A section on clarification of terminology and abbreviations was followed by a brief outline of the chapters.