Development and Evaluation of an Assessment Method for the Career Counselling of Children with Dyslexia: A Case Study Approach

Thesis submitted to

Martin Luther Christian University, Shillong

for the Degree of Doctor of Philosophy

By

Sajma Aravind

under the supervision of

Dr. Gideon Arulmani

Declaration

I hereby declare that this thesis entitled

Development and Evaluation of an Assessment Method for the Career Counselling of Children with Dyslexia: A Case Study Approach

submitted to Martin Luther Christian University, Shillong for the degree of

Doctor of Philosophy

is a bonafide effort made on my part under the supervision of

Dr. Gideon Arulmani

This work has not been submitted to this or any other university for the award of any degree or diploma. Any other source of information utilized in the study has been duly acknowledged by me.

Place: Bangalore, Karnataka

Date: 3rd August, 2018

Sajma Aravind
Research Scholar
Martin Luther Christian University

Dedication

I dedicate this thesis to the loving memory of

Ankita Srivastav

a loving friend and an extraordinary colleague

Certification

This is to certify that the thesis entitled

Development and Evaluation of an Assessment Method for the Career Counselling of Children with Dyslexia: A Case Study Approach

submitted by Sajma Aravind to Martin Luther Christian University, Shillong for the degree of Doctor of Philosophy embodies original work done by her under my supervision. This research work has not been presented for any degree or diploma to this or any other University.

Place: Bangalore
Date: 3rd August, 2018

Dr. Gideon Arulmani
Supervisor

Acknowledgement

My most sincere thanks is due to many people over the five years of this arduous journey.

First and foremost, I thank Dr. Gideon Arulmani, who has not only been my mentor and guide for this research, but also a pillar of strength and support during many difficult times. This work would not have been possible without him. For his wisdom, patience, and utmost faith in my abilities, I express my deepest gratitude.

This research was built on the contribution of the best and most brilliant minds in the field of learning disabilities. I thank Dr. Sonali Nag for her constructive and valuable inputs at every stage of this journey.

I thank all members of my expert panel whose wide experience and unmatched expertise have been building blocks in this research. Thanks goes to Prof. Sunder Rao, Dr. Gayatri Krishna, Dr. Akila Sadasivan, Dr. Kamala Mukundan, Ms. Veena Venkataramu, Mr. Sachin Kumar, Ms. Bindu Vijaykumar, and Ms. Laila Thakkar for their valuable time and insightful inputs.

My heartfelt gratitude to all the students and parents for participating in my research and letting me into their lives. I thank them for trusting me with their stories, concerns, and hopes. I also thank the management, principals, and teachers who permitted me to work in their schools and gave me access to their students in spite of hectic academic schedules.

I extend my heartfelt gratitude to Prof. Glenn Kharkongor for his valuable insights at various junctures of my journey. Along with him, I also thank the Doctoral Committee members Dr. Sairabell Kurbah and Dr. Melari Nongrum for being supportive of my requests and extending their cooperation throughout.

My most sincere thanks to the team at The Promise Foundation for their unwavering and enthusiastic support. I thank my colleague, Rayan Miranda, for sharing his academic expertise for this research. I also thank him, Laxmi Sutar, Robert D'Souza, Sandra Buela, and the support staff at The Promise Foundation for managing my professional responsibilities during my absence at work.

I express my gratitude to my academic colleagues turned friends, Suchitra Ramakumar and Chakradhar Buddha, for the stimulating discussions and constant encouragement. I also take this opportunity to cherish forever my memorable interactions with Ankita Srivastav.

I am indebted to my parents, Rathi Aravind and Aravindakshan K. V. for always being there for me. I thank my sister, Sajna Aravind and her family, Rahul K. A., and Mihika Rahul for their love and support.

I thank my dear friends, Lawrence Fernandes, Mishal Andrade, Nivita Vijay, and the faculty and students of the 2008-2010 batch of the Post Graduate Department of Psychology, SDM College, Ujire for being there whenever I needed them.

Abstract

Assessment is a key component in career guidance and serves to help a person to understand their interests, aptitudes, and potentials to identify careers for which one is suitable. However, this objective is achieved successfully only when the assessment methods that are used are suited to the client's requirements. A commonly used method of assessment for career guidance in the Indian context is tests. This research investigates the suitability of tests for a special group, students with dyslexia. Students with dyslexia experience difficulties with reading and writing. Due to these difficulties, the use of tests with students with dyslexia may generate results that do not reflect the person's true potentials. This study has aimed at developing a form of assessment that could address the needs of students with dyslexia.

This research aimed to use the case study approach to address the issue of suitability of standardised, psychometric tests career assessment tools for children with dyslexia and the development of a career assessment method for children with dyslexia. The study comprised two groups – the Study Group and the Comparison Group. The Study Group comprised six students, three boys and three girls, with a diagnosis of dyslexia. The Comparison Group comprised 1,200 students with no known history of learning disability, with approximately same number of boys and girls. One of the objectives of the study was to compare the Study Group and the Comparison Group on the quality of their performance as well as level of difficulty experienced in taking a standardised, psychometric test of aptitude. The aptitude test used in this study was the Multiple Potentials Test-5 (MPT-5) (Arulmani, 2005). The Tests and Me Questionnaire was developed to assess the difficulty experienced in test-taking. The next objective of the study was to assess the performance of the Study Group on two

alternate forms of the MPT-5. The two forms, called the Extended Time Form and the Oral Form, offered two types of accommodations to the students that were commonly availed by students with learning disabilities in educational settings. The final objective of the test was to construct a Learning Skills Profile (LSP) Tool that can plot the areas and severity of difficulties experienced by the student in his or her learning profile. The purpose behind the development of the student's learning skills profile was to use the data obtained to select the most suitable of the two accommodations, for a given student.

Both the Study Group and the Comparison Group were administered the MPT-5 and the Tests and Me Questionnaire. Analysis of the scores for both these tests indicated that, on the whole, the Study Group (students with dyslexia) obtained lower scores on the MPT-5 as against the Comparison Group (students without dyslexia).

Next, the two alternate forms of the MPT-5 were administered to the students of the Study Group, followed by the Tests and Me Questionnaire. Analysis of the scores indicated that all students in the Study Group performed better in the alternate forms as compared to the standardised test. The level of difficulty reported for the alternate forms was also lower than that reported for the standardised test.

Finally, the LSP Tool was used with the students of the Study Group and a learning skills profile was developed for each student. The learning skills profile yielded useful information to explain the students' preference for one or the other alternate forms. However, individual variations were found in the students' performances. Information collected through detailed interviews with the parents and students of the

Study Group were used to identify other important influences that could affect the suitability of a student for an alternate form of test.

Recommendations are made for career counsellors to increase their awareness and sensitivity about career development needs and challenges of students with dyslexia. The study also presents career guidance resources, in a draft form, which could be used in assessments for career counselling for children with dyslexia.

Table of Contents

Index of Tables

Index of Figures

Glossary

Acronym	Full Form
ICF-CY	International Classification of Functioning, Disability, and Health-Children and Youth Version
LSP Tool	Learning Skills Profile Tool
MPT-5	Multiple Potentials Test-5
MPPQ	Multiple Potentials Parents Questionnaire
S	Standardised aptitude test
T	Extended Time Form
O	Oral Form
L	Linguistic
AL	Analytical-Logical
S	Spatial
P	Personal
PM	Physical-Mechanical

Chapter 1

Introduction

The background to this study emerges from the researcher's personal experiences, over the last seven years, as a counselling psychologist with specific specialisation in career psychology. She conducts career counselling sessions for students in individual, small group, and workshop settings, and has conducted programmes for more than 3,000 children over the last seven years. She is also a lead trainer in a certificate course in Basic Skills for Career Counselling through which she trains other professionals in this method of career counselling. As a part of her work as a counselling psychologist, the researcher also works in a special needs clinic where she administers different psychometric tests to assess children for their reading, writing, and spelling skills, as well as tests to measure their intelligence quotient (IQ). These tests are usually conducted on children, ranging from 5 years to 18 years of age, to identify the presence of learning disabilities contributing to their academic difficulties. The tests are also conducted as a follow up to earlier assessments, to evaluate current level of functioning. Her professional experience, therefore, spans both career guidance and counselling and assessment of children with learning disabilities. These experiences of working with students, especially students close to high school and higher secondary education, brought to light the unique challenges that children with learning disabilities face as they prepare to enter higher education.

Career guidance and counselling are increasingly recognised as making substantial contributions to the individual's wellbeing and prosperity trajectories (e.g., Organisation for Economic Co-operation and Development [OECD], 2004; www.unworldyouthreport.org). It has been found, for example, that good quality career guidance is closely linked to high quality performance in the world of work

(OECD, n.d.). At the heart of good quality career guidance lie suitable forms of assessment that help the career chooser develop a deeper sense of self, personal interests and aptitudes. Assessment itself has become a subject of controversy, particularly with reference to the quantitative and qualitative approaches to assessment and testing (e.g., Arulmani, 2015a). However, whatever the method of assessment may be, it must be culturally and psychologically suited to the needs and realities of the person being assessed. Most forms of assessment have been designed to suit the needs of the "mainstream". The fact that more than 5 to 15% of school-going children could be students with dyslexia (Diagnostic and Statistical Manual of Mental Disorders [DSM-5]; American Psychological Association [APA], 2013) has hardly been taken into account. These are individuals with difficulties with reading and comprehension. If these individuals are subjected to forms of assessment that rely on a well-developed proficiency for reading, it is unlikely that results obtained would reflect the person's true potentials. This study has aimed at developing a form of assessment that could address the needs of students with dyslexia. This introductory chapter lays out the background for this study and introduces its main constructs.

1.1. Career Counselling

Different forms of counselling have emerged to address different types of difficulties and problems. Problems could be related to broad areas such as handling emotional or behavioural issues or to specific areas of life such as education, relationships, or career. This research focuses on the specific area of career counselling.

Watts (2013) defined career guidance services as being "…concerned with helping individuals to choose between the full range of available opportunities, in relation to their distinctive abilities, interests and values." This definition highlights two main objectives of the career guidance process: to help clients understand their interests and abilities and to help them explore different career options. The starting point for this process would be to help clients such that their self-understanding is deep enough to make effective career choices. Different career counselling approaches lay emphasis on understanding different aspects of the individual for career choice. Some methods focus on understanding interests while others focus on aptitudes, talents, and skills. Assessment for career counselling is central to the theme of this research. Again, different career counselling systems use different methods to assess an individual. Some systems take the psychometric approach while others take the qualitative approach.

1.2. Assessment

Assessment is a key component in almost all forms of career counselling. It often forms the first step in the counselling process that lays the foundation for further steps in the counselling process such as identifying suitable career alternatives and planning career paths. This section defines assessment and the methods of assessment that are used in career counselling.

Assessment can be referred to the process of systematically collecting information for a particular purpose using different tools or methods. Assessment methods may vary according to the purpose of the assessment, the type of data or information that is to be collected, and the theoretical orientation of the assessor.

In career counselling, the purpose of assessment is to help clients to understand their interests, abilities, beliefs, and needs, such that they are able to make effective career choices. Different career counselling methods employ different methods of assessment to collect data about the client. While some methods may use tests to assess the client's interests and talents, other methods may use interviews with the client to collect information. Broadly, these assessment methods can be classified under two approaches: quantitative and qualitative approaches. The next section looks in detail at these two approaches.

1.2.1. The quantitative approach to assessment.

The quantitative approach, broadly speaking, is based on the trait-factor theory in psychology which assumes that the individual has traits or attributes and that these traits can be measured. Assessment that is based on this approach seeks to measure traits and quantify them, that is, assign a numerical value to the trait. The most common assessment method that follows a quantitative approach is a psychological test which is described as a ". . . device or procedure designed to measure variables related to psychology" (Cohen & Swerdlik, 2005, p. 5-6). Psychological testing is based on a logical positivist, empirical epistemology which emphasises that only knowledge that can be verified in an empirical manner is meaningful. "Good" psychometric tests use the constructs of validity and reliability to ensure that the test yields accurate and objective information.

Tests are also based on several other assumptions. A test consists of items that seek to assess a sample of human behaviour. The person's performance on these selected items is then used to make a prediction about the whole behaviour. Thus, another main assumption that tests rest upon is that the individual's performance on the items of a test can unveil an attribute or predict behaviour in real life.

Tests measure an attribute and assign a score (a numerical value) to it. For most tests, this score is interpreted against a norm. The norm indicates the performance of a large representative group on the test. Thus, in effect, norm-based tests are useful to understand how much of an attribute an individual possesses in comparison to that of a larger, representative group.

Tests are so commonly used in assessment that the two terms, *assessment* and *testing* are often used synonymously. However, technically there is a difference between the two. Testing is defined as ". . . the process of measuring psychology-related variables by means of devices or procedures designed to obtain a sample of behaviour" (Cohen & Swerdlik, 2005, p. 3). Hence, while testing is a form of assessment, the term *assessment* is a broader concept that encompasses testing as one of its methods.

1.2.2. The qualitative approach to assessment.

The other approach to assessment is the qualitative approach. In contrast to the quantitative approach, this approach is based on the epistemological notion of subjectivity and focuses on describing rather than measuring (Arulmani, 2015a). This approach places the individual and his or her context at the centre of the assessment process. This approach uses methods such as observations, interviews, and discussions that yield descriptive data about the individual which is then analysed to yield a subjective understanding about that individual on certain attributes.

Qualitative methods of assessment aim to collect in depth information about the individual. The information collected using these methods is non-numerical and is usually in the form of verbal descriptions. Qualitative methods often help the assessor to answer questions pertaining to the *how* and *why* of the situation at a micro level. These methods often require the assessor to spend considerable time with the assessee

to collect the required information. Some methods of data collection such as interviews require one-on-one interactions with the assessee. While these are the strengths of the qualitative method, they are also seen as the practical challenges of this approach especially when it comes to situations where a large number of people have to be assessed in relatively shorter time spans.

1.2.3. Quantitative versus qualitative approaches.

Both the quantitative and qualitative approaches have their own strengths and limitations. The main strength of the quantitative approach is that it can give valuable information in a relatively shorter time, at lower cost. Another main advantage of quantitative methods like tests is their compatibility to the group format: A large number of people can be assessed at the same time. It is, hence, more cost and time effective. The strength of the qualitative approach lies in its ability to gather detailed information about a client. Qualitative methods often help the assessor gather information that may not be possible to gather through standardised tests.

Both these methods also have their disadvantages. Psychological tests are effective only when they are constructed, administered, scored, and interpreted in a culturally resonant manner. Thus, while a good test should be easy to administer and score, constructing a test that meets the necessary statistical rigour is not easy. On the other hand, a test that is well-constructed may not yield the right results if it is administered, scored, or interpreted in the wrong way. Hence, the assessor must always choose to use appropriately constructed tests and follow all accompanying rules of administration, scoring, and interpretation to get accurate results.

Some of the practical limitations of the qualitative methods have already been listed above: They are time consuming and less amenable to the group format. Another main limitation of the qualitative method is assessor bias. Since qualitative

data collection methods often do not follow a fixed and standardised format, it is possible that the assessor's pre-conceptions and biases affect the assessment process.

A third approach to assessment that attempts to circumvent the shortfalls of purely quantitative or qualitative approaches is the mixed methods approach to assessment. In a mixed methods approach, both quantitative as well as qualitative assessment methods are used to gather information about the individual. Thus, information collected using one method is verified and validated against information collected using the other method. Thus, a mixed methods approach to assessment is not simply about collecting both quantitative and qualitative data, but using these in tandem to collect more comprehensive information as compared to that collected using any one of the approaches (Creswell, 2009).

1.3. Assessment in Career Counselling

Different career counselling methods have used different assessment methods to collect information about the client. While Western career counselling systems have, over the recent past, strongly taken to qualitative methods of career assessment (Bassot, 2014; Reid &West, 2014), the use of psychometric tests for career counselling remains in-demand and is common practice in India. However, the common trend is for tests that have been developed in the West to be imported and used in the Indian context (Arulmani, 2014a; Hansen, 2005). The main reason for this is that test construction is an expensive, time consuming, and rigorous process. In some cases, Indian norms may be developed for tests that were originally developed in the West. In such cases, the test may still be linguistically and culturally alien to the Indian context.

It is here that the point that is critical to the objectives of this study emerges. In a developing country like India, financial and human resources are often constrained. As a result, as and when tests are developed they almost exclusively cater to the larger, "regular" population. Some of the characteristics of such tests are:

- They are paper pencil tests.
- Tests are language mediated (most tests are in English).
- Tests are generally speeded or power tests. Speeded tests are tests in which all items have a uniform (generally low-middle) level of difficulty and a time limit is established so that the tests assess the speed with which the test taker responds to the items, with accuracy. Power tests, on the other hand, have items with higher difficulty levels and allow the test taker more time to answer.

Central to the objectives of this study is career counselling for individuals who do not belong to this "mainstream group". The specific group that is examined in this study is children with dyslexia. The next section introduces dyslexia in more detail.

1.4. Dyslexia

Dyslexia refers to a developmental disorder that is characterised by difficulties in skills related to reading. A developmental disorder refers to delays, disorders, or impairments that occur in developmental domains such as cognitive, communicative, social, or motor abilities. Developmental disorders are present at birth or emerge during early childhood (Odom, Horner, Snell, & Blacher, 2007). The delay or impairment typically leads to a functional impairment in one or more areas of the person's life (Thambirajah & Ramanujan, 2016). Dyslexia is one such disorder.

A succinct definition of dyslexia is provided by Nag and Snowling (2012) when they describe it be ". . . a developmental disorder affecting the skills involved in the

reading and spelling of words, in the absence of any intellectual impairment with symptoms ranging from mild to severe" (p. 6), and manifesting in various subtypes. The International Classification of Diseases and Related Health Problems, Version 11 Beta Draft (ICD-11 Beta Draft; https://icd.who.int/dev11/l-m/en) classifies dyslexia under developmental learning disorder which is described as ". . . characterized by significant and persistent difficulties in learning academic skills, which may include reading, writing, or arithmetic". Based on this, the ICD-11 Beta Draft categorised developmental learning disorder into three types:

1. Developmental learning disorder with impairment in reading: It is characterised by ". . . significant and persistent difficulties in learning academic skills related to reading, such as word reading accuracy, reading fluency, and reading comprehension".

2. Developmental learning disorder with impairment in written expression: It is characterised by ". . . significant and persistent difficulties in learning academic skills related to writing, such as spelling accuracy, grammar and punctuation accuracy, and organisation and coherence of ideas in writing".

3. Developmental learning disorder with impairment in mathematics: It is characterised by ". . . significant and persistent difficulties in learning academic skills related to mathematics or arithmetic, such as number sense, memorization of number facts, accurate calculation, fluent calculation, and accurate mathematic reasoning".

According to the ICD-11 Beta Draft, dyslexia generally manifests during the early school years when these academic skills are taught. It is also important to note that a diagnosis is given only when difficulties in academic skills cannot be explained by the following:

- Disorder of intellectual development

- Sensory impairment (vision or hearing)
- Neurological disorder
- Lack of availability of education
- Lack of proficiency in the language of academic instruction
- Psychosocial adversity

1.4.1. Characteristics of dyslexia.

As described by the ICD definition, dyslexia is characterised by difficulties in reading skills such as reading speed, accuracy, or reading comprehension (https://icd.who.int/dev11/l-m/en). Dyslexia is characterized by difficulties in reading and reading comprehension. Reading is marked by additions, omissions, distortions, substitution of words, and slowness in reading (APA, 2013; https://icd.who.int/dev11/l-m/en). As a result of challenges with reading comprehension, individuals with dyslexia often tend to rely on general knowledge when answering questions from a given text (https://icd.who.int/dev11/l-m/en). Difficulties with grammar and vocabulary, spelling, and speed of processing are also common in dyslexia (Nag & Snowling, 2012; https://icd.who.int/dev11/l-m/en).

It is also commonly associated with comorbid conditions such as attention deficits, numeracy difficulties, motor coordination difficulties, and anxiety symptoms. About 30-50% of children who have dyslexia, also have one or more comorbid conditions (Sahoo, Biswas, & Padhy, 2015; Thambirajah & Ramanujan, 2016). Conditions such as speech and sound disorders, attention deficit disorders, and emotional disorders may be present comorbidly with dyslexia (Nag & Snowling, 2012). Children with dyslexia vary in the type and severity of difficulties exhibited and, therefore, no two children would exhibit the same profile of difficulties.

There is lack of reliable data on the prevalence of learning disability in India, however, some Indian studies have estimated the prevalence at 10% of the school-going population (John, George, & Mampilli, 2004; Rehabilitation Council of India [RCI], n.d.). Prevalence is estimated to be higher among boys than among girls.

1.4.2. Importance of self-understanding for children with dyslexia.

Self-understanding, from the view point of career counselling, refers to deepening the person's knowledge of personal interests, aptitudes, and talents. While self-understanding can be insightful and beneficial to any person in the career counselling process, it can be even more so for the person with dyslexia. Many studies highlight the effects of such self-knowledge not only on the career choice process but on overall well-being. Anctil, Ishikawa, and Scott (2008) studied college graduates with learning disabilities who were academically successful (as indicated by their GPA) and found that they constructed a profile of their strengths and weaknesses. This knowledge helped them to take career decisions which had made them successful. Knowledge of abilities, strengths, and weaknesses have enabled children with learning disabilities to make decisions about their career, even when it required them to oppose the influences of significant others (including parents) in their lives (Anctil, Ishikawa, & Scott, 2008; Nag, 2014).

1.4.3. Assessment for career counselling for persons with dyslexia.

The characteristics of dyslexia described above raise questions as to whether standardised test formats would yield effective results when used for persons with dyslexia. Recognizing this as an impediment, school boards in India offer children with dyslexia (and children with other types of disabilities) certain accommodations and concessions when taking school exams. Examples of the most common of such accommodations include allowing extra time for writing exams, permitting the use of

a scribe or a reader during exams, and taking the exam in a separate room (Central Board of Secondary Education, 2017; Council for the Indian School Certificate Examinations, 2017). Some studies have tried to investigate how modifications made on test items can affect its readability for children with learning disabilities. For example, Johnstone, Liu, Altman, and Thurlow (2007) found that, on the whole, modifying test items to make them more "learning disabled-friendly" increased the chances of children giving the correct answers. The study also revealed that the type of modification made had an effect on improving the chances of giving the correct answer. Some modifications such as lowering vocabulary level and removing prefixes were found to be more helpful in improving scores compared to other types of modifications, such as reducing the text load and presenting the text with a bold typeface.

Thus, in general, it is possible that adjustments made in standardised testing procedures contribute to making tests more "friendly" to children with learning disabilities such as dyslexia. Such special adjustments are termed as *modifications* or *accommodations.*

It is important to understand how we can assess children with learning disabilities in a sensitive yet effective manner. In listing the important skills that career guidance professionals should keep in mind when working with children with learning disabilities, Nag (2014) highlights the importance of being able to adapt standardised tests in order to collect meaningful data and to identify the person's potentials through means beyond the marks they are given for academic performance. Nag (2014) goes on to explain that difficulty with reading speed, for example, can have implications on the child's suitability to take a timed test. However, an

important concern that arises here is for the career counsellor to understand what kind of accommodations will benefit the child. As described earlier in this chapter, children with dyslexia can exhibit a varying range of strengths and difficulties in their "dyslexia profile". Differences may be seen both in the nature of the difficulties and its severity.

Thus, while a student may carry the diagnosis of dyslexia, it is important to note that the nature of this condition is such that each individual presents a unique profile. Therefore, taking a broad nomothetic approach that rests on general principles may be less suitable than a more ideographic, individual-specific approach. Hence, the case study method was selected as the method to be used to understand the unique profile of difficulties and needs of students with dyslexia. The next section describes the case study method in more detail. .

1.5. The Case Study Method

Given the importance of accounting for unique variations in the profiles presented by individual students, the case study method has been used as an important research method in this research. The case study method can be defined as an ". . . intensive, systematic investigation of a single individual, group, community or some other unit in which the researcher examines in-depth data relating to several variables of people or a unit" (Heale & Twycross, 2018). In the case study method, an event or phenomenon is investigated in its context by the examination of a unit or multiple units. In a sense, the unit is the universe. The evidence for examining the cases come from multiple sources and can include numerical and descriptive data. To understand the phenomenon, the information about the unit/units under study could be juxtaposed against other comparable units with a view to gaining deeper insights about the unit

under study (Yin, 2009). The case study method is used in research to study a phenomenon in its context (Baxter & Jack, 2009). This method seeks to understand the *how* or *why* and asks questions pertaining to a phenomenon, from an idiographic view point, as opposed to surveys or experiments that explain incidences and frequencies, from a nomothetic view point (Yin, 2009). The strength of the case study lies in its ability to provide holistic and in-depth explanations of phenomena. The case study method requires the researcher to look beyond the quantitative data and understand the event from the subject's perspective (Zainal, 2007). Thus, while quantitative analysis seeks to understand patterns in data at the macro level, case studies observe the data at the micro level (Zainal, 2007). Given the central aim of this study, which is to understand the needs of students with dyslexia and given the individual specific requirements of this target group, the case study method has been adopted for this research

1.6. Problem Formulation

1.6.1. Problem statement.

Based on the above discussion, the problem this research focuses on may be formulated as follows: Dyslexia is a developmental disorder that is characterized by difficulties in skills related to reading, writing, and spelling, in the absence of any intellectual impairment. These difficulties may manifest as word reading accuracy, reading fluency, and reading comprehension. There could be significant and persistent difficulties in learning academic skills related to writing, such as spelling accuracy, grammar and punctuation accuracy, and organization and coherence of ideas in writing. As a result, persons with dyslexia are typically slower in their responses to tests and have difficulties in presenting their ideas in a logical and

sequentially organised manner. Assessment, either quantitative (using psychometric tests) or qualitative (using interviews and observations), is central to any form of career guidance. The features of dyslexia affect the individual's performance on a psychometric test when he or she is required to meet the standardised requirements of the test such as completing the test within the stipulated time period. Further, in almost all cases, the norms of a given test are developed on the performance of a sample that is not affected by dyslexia. Hence, these norms are not representative for an individual with dyslexia. As a result, a psychometric exercise with persons with dyslexia is not likely to yield a reliable result with the high likelihood of the individual underperforming on the test. A qualitative, interview based approach to assessment might be more suitable for a person with dyslexia. But here too the results might be blunted by the assessee's characteristics of poor verbal fluency as well as the subjectivity brought to the exercise by the interviewer. Further, this approach is highly time consuming and may not be suitable when a number of individuals need to be assessed. At the same time, it has been estimated that the prevalence of dyslexia could range between 5-15% (about 10% in India) among school-going children across all cultures. Despite the urgency of the situation, little or no work has been done to develop career counselling assessment systems that are specifically suited to the needs of persons with dyslexia. Therefore, the problem that this research addresses is the development, not merely of a device, but of a system of assessment that would bypass the skill deficits manifested by children with dyslexia and allow the career counsellor to accurately develop a profile of the individual's interests, assets, and talents. This system comprises an initial assessment that helps to understand the learning skills profile that a student with dyslexia displays. The results of this assessment can inform the counsellor as to what kind of accommodations incorporated into the

standardised testing process would best benefit the student. It is anticipated that, at the end of this research, recommendations could be made for the development of specific career counselling programs that could offer relatively better career development advice for persons with dyslexia.

1.6.2. Research questions.

1. Is there a difference between students without dyslexia and students with dyslexia in the quality of their performance on a standardised, quantitative assessment of aptitudes? If so, what is the nature of this difference? How does it affect the process of career counselling for students with dyslexia?
2. How do accommodations improve the test performance of students with dyslexia?
3. How can an individualised learning skills profile contribute to understanding the student with dyslexia's performance on alternate forms of a psychometric aptitude test such as the Multiple Potentials Test-5 (MPT-5)? How can an individualised learning skills profile inform the selection of accommodations to ease test-taking and thereby improve the test performance of students with dyslexia?

1.6.3. Research objectives.

Based on initial field experience and a review of the literature, the following objectives were formulated for this research.

The first objective of the research was to compare the performance of high school students without dyslexia, with the performance of students with dyslexia on the MPT-5(Arulmani, 2005), to understand the difference, if any, between these two groups on the quality of their performance on a standardised, quantitative measure of aptitude.

The second objective was to compare these two groups on the level of difficulty they experienced in taking a standardised, quantitative aptitude test by constructing a self-report measure (the Tests and Me Questionnaire) for this purpose.

The third objective was to construct a Learning Skills Profile (LSP) Tool based on the International Classification of Functioning, Disability, and Health-Children and Youth Version (ICF-CY; World Health Organisation [WHO], 2002) to understand the test-taking difficulties of students with dyslexia from a functions rather than a deficits perspective.

The next objective was to assess the performance of students with dyslexia on two alternate forms of the MPT-5 constructed for the purpose of this research. The two alternate forms offered one type of accommodation each: One form was an Extended Time Form and the second was an Oral Form. The research aimed at examining the relative effectiveness of the two alternate forms by drawing upon data from the LSP Tool, a re-administration of the Tests and Me Questionnaire, and a comparison of students' performance on the two alternate forms of the MPT-5.

The final objective of the research was to use the findings to make recommendations on how information from the LSP can help to identify what mode of accommodation is most effective to improve ease of test-taking amongst students with dyslexia.

1.7. Conclusion

In summary, career counselling can play an important part in helping persons with disabilities to not only identify suitable career options but also to identify personal potentials and navigate barriers to increase their participation in society. Assessment, if conducted in a person-centred manner, can help identify strengths and

interests that the person can capitalise on. This research focuses on assessment for career counselling for children with dyslexia. The language and cognitive challenges that characterise dyslexia make many of the current assessment methods unsuitable for children with dyslexia. The aim of this research is to develop a method of assessment that is sensitive to the test-taking difficulties of children with dyslexia.

The next chapter reviews the literature and discusses important concepts that have been touched upon in this introduction. The literature review will aim to create the framework for this study by understanding what and how much is currently known about career assessment for persons with dyslexia.

Chapter 2

Review of Literature

This chapter introduces the key concepts related to this study. This study is located around three main constructs: (a) dyslexia, (b) career counselling, and (c) assessment in career counselling. Undergirding the methodology for this research is the case study approach. The chapter examines the need for career counselling for children with dyslexia. It also examines the challenges in assessment for career counselling of children with dyslexia. It develops an argument for the case study being the most suitable method for this study and concludes with building of the rationale for the need of this study.

2.1. Dyslexia

Dyslexia is a type of learning disability that is characterised by difficulties with reading. In order to understand the concepts of learning disability and dyslexia, this section first focuses on understanding what disability is.

2.1.1. Disability.

Disability is a complex, multidimensional condition that can affect all spheres of life. The extent of impact of disability on one's life is influenced by many factors. Some factors are related to the disability itself such as the nature of the disability (for e.g., sensory disabilities, orthopaedic disabilities, cognitive disabilities), the severity of the disability (ranging from mild to profound), and nature of onset (congenital versus acquired). In addition to this, the experience of the disability is also affected by other factors such as age (e.g., Pentland, McColl, & Rosenthal, 1995), gender (e.g., Synder, 1999), and socioeconomic status (Taylor, 2010).

The understanding of the concept of disability has changed considerably over time. The earlier, medical model looked at disability as an inherent characteristic of the person and focussed intervention on treating the physical difficulties experienced by the person (Brisenden, 1986). The alternate social model viewed disability as a product of the environment and shifted focus of the intervention to the psychological and social aspects of the disability (Crow, 1996). The most current model, a bio-psycho-social model, combines both the medical and the social model and views disability as the result of interaction between health, psychological, and social aspects of a person's environment (WHO, 2002). In this model, disability is viewed as a product of the interaction of health conditions, and how the person and the environment react to it. According to this model, two persons with the same type of health impairment may experience different levels of disability depending on how they themselves and their environment perceive it.

The presence of a disability impacts one's participation in many areas of life. Of interest to this research is the impact of disability on the career development of an individual. While people with disabilities may experience career development tasks and career development challenges that are similar to people without disabilities, they also face certain unique challenges as a result of their disability. A comprehensive review of literature by Enright, Conyers, and Szymanski (1996) on the impact of disability on career development identified that factors such as decision making-ability, self-concept, age of onset of disability, type of disability, and gender are prominent influences on the career development process of individuals with disabilities. The World Health Organization's (2011) World Disability Report found that, in children, the presence of a disability often affects educational attainments. Examples of some of the challenges that children with disability experience in

education are limited access to education, lack of relevant resources, difficulty in coping with academics, and stigmatization by teachers and peers (Banerjee, Mehendale, & Nanjundaiah, 2011; Hitchings et al., 2001; Luzzo, Hitchings, Retish, & Shoemaker, 1999). These challenges also continue further on as they transition into the world of work. It was reported that children with disability, as they enter adulthood, are faced with reduced job opportunities, are more likely to be unemployed and earn lower incomes (WHO, 2011).

While many countries are now striving to create an inclusive environment for people with disabilities by enacting laws, it is common for these legal provisions to be poorly realised in the actual work place. It has been difficult to estimate the prevalence of disabilities in India due to the differences in the definitions of disabilities employed by population surveys in India (Jeffery & Singal, 2008). However, even the census, which adopts a narrower definition of disabilities (as compared to the National Sample Survey), estimated the number of persons with disabilities in the 2011 survey to be as high as 27 million (Census of India, 2011). In India, the labour market participation of working age disabled persons (38.8%) is lower than that of non-disabled persons (64%) (Mitra & Sambamoorthi, as cited in Powers, 2008). Thus, a large number of India's population is straddled by career development challenges with very little or no services to address their challenges.

Amongst the different kinds of services that are offered to persons with disabilities, career counselling has been recognised as an important component in programs and services for students with special needs (Phelps & Hanley-Maxwell, 1997). Reports from many countries, both high-income and low-income, indicate that people with disabilities, when provided with the right kind of support in their career

development, can transform into strong and contributing members of the workforce (Parmenter, 2011).

This study focuses on the interface between career counselling and a specific type of disability, namely learning disability. The following section examines the concept of learning disability in detail.

2.1.2. Learning disability.

The term *learning disability* was first introduced by psychologist, Samuel Kirk in 1963 and, in general, refers to difficulties that a person experiences in learning. Other synonymously used terms are *learning difficulties* and *learning disorders*. The term *learning disability* has different meanings in different countries. While in the U.S. the term refers to dyslexia, in the U.K. learning disability refers to intellectual disability.

Learning disability is today viewed as a developmental disorder. Developmental disorders are described as ". . . neurobiological conditions that interfere with the acquisition, retention, or application of specific skills or sets of abilities" (Thambirajah & Ramanujan, 2016, p. 5). The International Classification of Diseases and Related Health Problems, Version 11 (ICD-11 Beta Draft, https://icd.who.int/dev11/l-m/en) labels it as *developmental learning disorders* (DLD). The ICD-11 Beta Draft defines learning disability as characterised by ". . . significant and persistent difficulties in learning academic skills, which may include reading, writing, or arithmetic" (https://icd.who.int/dev11/l-m/en). A learning disability is only diagnosed when difficulties with learning are present in the absence of other conditions such as mental retardation and/or any neurological, sensory, or motor deficits. Diagnosis should also rule out the possibility that the difficulties in learning are as a result of improper education, lack of proficiency in the language of

academic instruction, or psychosocial adversity (APA, 2013, https://icd.who.int/dev11/l-m/en.).

The onset of learning disability occurs in childhood and is most often detected during the early school years when academic difficulties surface. Learning disabilities vary in the type and severity of difficulties exhibited. Conditions such as speech and sound disorders, attention deficit disorders, and emotional disorders may be present co-morbidly with learning disability (Nag & Snowling, 2012). The latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013) has placed the prevalence of learning disability at 5-15% among school-going children across all cultures with a higher prevalence among boys compared to girls.

Learning disability has been categorised into three types by the ICD-11 Beta Draft (https://icd.who.int/dev11/l-m/en.):

2.1.2.1. *DLD with impairment in reading*.

The most prevalent form of learning disability is difficulty in reading, commonly known as dyslexia. It is characterised by impairment in the development of reading skills such as reading speed, accuracy, and/or comprehension. It is also frequently associated with difficulties in spelling.

2.1.2.2. *DLD with impairment in written expression*.

The main feature here is difficulties with written expression such as spelling accuracy, grammar and punctuation accuracy, and organization and coherence of ideas in writing.

2.1.2.3. *DLD with impairment in mathematics*.

This category of learning disability is characterised by difficulties in skills related to mathematics such as number sense, memorization of number facts, accurate

calculation, fluent calculation, and accurate mathematic reasoning. This form of learning disability is commonly known as dyscalculia.

Due to the varied nature of difficulties experienced in the different types of learning disabilities, this research focuses on one type, namely, DLD with impairment in reading or dyslexia.

2.1.3. Dyslexia.

Dyslexia is one of the most researched and best understood forms of learning disability (Hulme & Snowling, 2009). It has been variously referred to as *reading disorder* or *reading difficulty*. The concept of dyslexia has changed over the years since the condition was first identified and several attempts have been made to define dyslexia. Snowling (2000) describes these efforts starting from the first reported case of dyslexia in the British Medical Journal in 1896 wherein it was referred to as congenital word blindness. A number of theories have been propounded that attempt to explain and describe dyslexia. Rather than presenting the various schools of thought, this review interweaves the main theoretical constructs under the headings: approaches to understanding dyslexia, characteristics of dyslexia, and diagnosing dyslexia.

2.1.3.1. *Approaches to understanding dyslexia.*

An early epidemiological study of dyslexia conducted in 1975 by Rutter and Yule on the Isle of Wight is considered as a landmark study in the field. An important early milestone in the approaches to understanding dyslexia as exemplified by this study was the introduction of the discrepancy approach to identifying dyslexia. This approach is based on the assumption that intelligence is correlated with reading ability and that the intelligence quotient (IQ) can be used as a measure to estimate the expected level of reading ability. Hence, a discrepancy between IQ and reading

ability would help in identifying children with dyslexia (children whose reading ability was lower than what was expected on the basis of their IQ). The study also helped to distinguish children with specific reading difficulties as compared to children with reading difficulties in the context of general learning problems (children with low reading ability but at the expected level for their intelligence).

However, the discrepancy approach to understanding dyslexia encountered problems and was criticised for many reasons. The most important criticism was that this approach over simplified the concept of dyslexia. As research progressed in the field of reading and dyslexia, it was found that learning to read was a complex process resulting from the interaction of multiple processes such as phonological, visual, and semantic processes.

2.1.3.2. *Characteristics of dyslexia.*

The main symptoms of dyslexia are difficulties with aspects of reading such as accuracy, speed, and comprehension. Oral reading is characterised by additions, omissions, distortions, and substitution of words; slow pace of reading; and errors in comprehension (APA, 2013; https://icd.who.int/dev11/l-m/en). Difficulties with reading comprehension have a cascading effect and manifest in the form of inability to recall facts, and to draw inferences or conclusions from the material read. As a result of their poor reading comprehension skills, children with dyslexia very often use general knowledge to answer questions from the given material rather than information from the material itself (Thambirajah & Ramanujan, 2016). Children with dyslexia also experience difficulties with grammar and vocabulary, and speed of processing (Nag & Snowling, 2012). Dyslexia is also frequently linked to spelling difficulties which often persist into adolescence even after progress in reading skills has been achieved. As a result, these individuals often cannot produce written work at

the same rate as their regular peers. In writing, they show errors in punctuation and are likely to omit, repeat, or insert small words or word endings. They find it difficult to proof read or edit their written work.

Attention deficits, speech sound disorders, numeracy difficulties, motor coordination difficulties, and anxiety symptoms are common co-morbid conditions. Conduct disorder and hyperactivity syndromes may be present during later childhood and adolescence (Nag & Snowling, 2012). The following table taken from Thambirajah and Ramanujan (2016) shows the indicators of dyslexia in different stages of schooling:

Table 1

Indicators of Dyslexia in Different Stages of Schooling (Thambirajah and Ramanujan, 2016)

Preschool child	Primary school child	Secondary school child
Trouble in learning the letters of the alphabet/akshara	Slow progress in reading	Oral performance better than written performance
Lack of grasp of rhyme	Slow, effortful reading	Slow laboured reading
Difficulty in learning nursery rhymes	Difficulty in reading from board; difficulty in reading unknown words	Misreading words; errors of substitution, omission, etc.
Mispronouncing words	Making numerous reading errors; slow laboured reading	Fear of reading aloud
Difficulty in naming objects and colours	Poor spelling	Poor spelling

Obtaining reliable data on the prevalence of dyslexia or even learning disability in India has been challenging. In India, the two major population surveys, the Census and the National Sample Survey, both conducted by the Government of India, do not collect data on learning disability. Some Indian studies have estimated the prevalence at 10% of the school-going population (John et al., 2004; RCI, n.d.).

2.1.3.3. *Diagnosing dyslexia.*

As described above, the diagnosis of dyslexia has been a debatable issue with some even negating the existence of the condition (Siegel, 1999; Sparks & Lovett, 2009). This is contrary to other types of disabilities for which often clear guidelines are specified for assessment. For example, the disability guidelines document released by the Ministry of Social Justice and Empowerment in India (2001) provides specific guidelines for evaluation and certification of mental retardation, locomotor/orthopaedic disability, visual disability, speech and hearing disability, and multiple disabilities. The document states the degree of disability that is eligible for concessions, the authorities that can issue disability certificates, tests that should be used to assess the disability, and validity of the disability certificate.

In India, further confounding the problems of diagnosis is the unique socioeconomic and cultural situation of the country. Poor quality of education, multiplicity of languages, and stigma associated with any kind of disability are some of the factors associated with unreliable diagnoses of dyslexia. Studies have shown that learning disabilities are under-recognised in India. The average age at which children are diagnosed is 11.36 years, approximately 6 years after the symptoms are first noticed (average age: 5.5 years) (Crawford, 2007).

Snowling (2000) highlights the shortcomings of the discrepancy approach in diagnosing dyslexia. She quotes examples of studies wherein children who initially met the discrepancy criteria, after a few years did not meet the criteria as a result of remediation. Also in the discrepancy approach, the cut-off point taken as indicative of disability is arbitrary. Shifting this point higher or lower could affect whether one receives a diagnosis or not. The last point presented as a criticism against this

approach is that the psychometric tools that are used to assess reading ability could also affect the diagnosis.

Often children with dyslexia are referred for assessment by the school for reasons such as academic under performance or behavioural problems. Diagnosis usually follows several steps such as interview with the parents, gathering information from school or teachers, analysis of child's written work, interview with the child, and administration of tests on the child (RCI, n.d.).

Though dyslexia is a well-researched form of disability, few studies have tried to understand it from the perspective of career counselling. The next section focuses on career counselling.

2.1.3.4. *Culture and dyslexia.*

The most current conceptualisation of disability take a biopsychosocial perspective and view it as the result of interactions between health and the psychological and social aspects of a person's environment (WHO, 2002). Disability is seen as a product of the interaction of health conditions and how the person and his/her environment react to it. Cultural overtones, therefore, become a key factor in the way disability is experienced. Two persons with the same type of health impairment may experience different levels of disability depending on the manner in which their cultures interpret it. Dyslexia is related to difficulties with skills related to reading and writing. Both of these skills are greatly influenced by culture. In certain cultures, reading and writing skills are culturally endorsed. In India, for example, students are expected to conform to the demands of mainstream education, which places a heavy emphasis on the student's ability to read and comprehend texts, memorize, and express acquired knowledge in the written form. Meeting these academic demands and obtaining good marks are seen as crucial to pave the way for

success in higher education and, thereby, future career development. Most students are prepared to accept that academics must be prioritised over all other pursuits and that their most important duty is to consistently obtain high marks in school. However, students with dyslexia experiences difficulties with reading, writing, and spelling which are precisely the tools through which education is imparted in mainstream schools. In such contexts, the presence of dyslexia may lead to greater stigma as compared to other contexts where these skills may not be valued as much. Hence, the diagnosis of dyslexia and the attitudes associated to it may vary from one cultural context to another.

2.1.3.5. *Dyslexia in other languages.*

There are numerous view points from which dyslexia has been studied. The most prominent amongst these is the understanding that dyslexia is a developmental disorder (Nag & Snowling, 2012). This implies its etiology could have a neurological basis. Argued from this perspective, dyslexia could be present irrespective of language type. It must also be kept in mind that the features of a given language affect the manifestation of the symptoms of dyslexia. A language like English for example has great variability in letter-sound correspondence and hence is often referred to as opaque. On the other hand, a language like Kannada is described to be more transparent since letter-sound correspondence is much higher. Therefore, while it is highly likely that dyslexia would manifest across languages, the severity of its manifestation would be influenced by a number of factors. Further, very little research has been conducted on non-English languages. Hence a scientific understanding of the manifestation of dyslexia in other languages is still in its early stages.

2.2. Career Counselling

2.2.1. What is career counselling?

According to the Organisation for Economic Co-operation and Development (OECD, 2004, p. 19), career guidance ". . . refers to services and activities intended to assist individuals, of any age and at any point throughout their lives, to make educational, training and occupational choices and to manage their careers". There are many approaches to career counselling and most of them are embedded in some theoretical position in the field of career psychology. The earliest approach in career psychology was the trait-factor approach introduced by Frank Parsons (1909). This theory viewed career choice as a process of matching an individual's traits with the requirements of a job. With the changing times, many new theories of career psychology emerged and as a result new methods of career counselling also came into being. Some of these later theories were Ginzberg's theory of occupational choice (1951), Roe's personality theory of career choice (1957), Holland's typological theory of career choice (1971), Super's developmental theory of career development (1990), and Krumboltz's social learning theory of career decision-making (1990). More recently, theorising has been strongly influenced by the constructivist epistemology and includes the narrative approach (e.g., Reid, 2005) and the systems theory approach (e.g., McMahon & Patton, 1995). Another important area of theorising is the cultural approach (e.g., Arulmani, 2014a; Leong & Pearce, 2011). However, it is important to note that while these theories explain the career development process, very few of these theories translate into actual systems or methods of career counselling that could be implemented to work with people. One example of a theoretically driven application for career guidance is Holland's typological theory which has been implemented as a comprehensive method of career counselling,

including psychometric tools and an occupational classification system. Another theoretically grounded method of career guidance developed specifically for the developing world context is the *Jiva* approach to career guidance and livelihood planning (Arulmani, 2009, 2010). The present research uses the Jiva method as its basis and further details are provided later in this chapter.

An important objective for any form of career counselling is the facilitation of clients' self-knowledge in order to help them make informed decisions regarding their career choices. Thus assessment, in some form, is an important component of career counselling. The next section provides an overview of assessment in career counselling.

2.2.2. Assessment in career counselling.

Psychological assessment is an important component in most forms of career counselling. Assessment is defined as ". . . the gathering and integration of psychology-related data for the purpose of making a psychological evaluation, accomplished through the use of tools such as tests, interviews, case studies, behavioural observation, and specially designed apparatuses and measurement procedures" (Cohen & Swerdlik, 2005). In career counselling, different methods of assessment are employed to assess various characteristics of a person such as interests, aptitudes, beliefs, personality traits, and so on to improve the person's self-understanding such that effective career choices are made. In the Introduction chapter, the three approaches to assessment, namely the quantitative, qualitative, and mixed approaches to assessment were described. Of interest to this paper is the quantitative approach to assessment since it is the commonly preferred method within the Indian school system. The most common method of assessment used in the

quantitative approach is the psychological test. The next section examines the logic and rationale that underlie psychological tests.

2.2.3. Psychological tests.

Psychological tests are used in different fields including health, education, counselling, business, and defence to name a few. Psychological tests require the test taker to perform a behaviour that will be used to measure a personal trait or an attribute or to predict an outcome. There are different types of psychological tests. Some of the criteria for the classification of tests are given below:

2.2.3.1. *Attribute measured*.

Tests can be classified into different types depending on the attributes that they measure (e.g., personality, intelligence, motivation, aptitudes, interests, beliefs, anxiety). The structure of the test depends on how the test developer defines the attribute being measured and the theoretical orientation of the test developer. Thus, one may have two tests that purport to measure interest but substantially differ in content because of the difference in the way in which interest is defined.

2.2.3.2. *How an attribute is measured.*

Tests may vary based on how the test assesses an attribute. Accordingly, tests may be categorised as tests of maximal performance or self-report tests. As the name suggests, tests of maximal performance aim to assess the best performance of the test taker. These tests usually present the test taker with clearly defined tasks and score him or her based on how well the task is performed. In psychology, tests of intelligence and aptitudes often fall into this category. However, other attributes such as values, emotions, and attitudes are not related to performance but rather what the client perceives. Such attributes are measured using self-report tests wherein the test taker reports what he or she thinks or feels about the construct being assessed. Self-

report tests rely on the test taker's willingness and capacity to accurately report their thoughts and feelings in the test.

2.2.3.3. *Administration and format.*

Tests can be administered in different ways that include paper-and-pencil tests, computer based formats, verbally-administered formats, or they may be performance based. The format of response options can also vary from binary items to multiple choices to rating scales and open ended answers.

2.2.3.4. *Structure of tests.*

Tests can be classified as objective and projective tests based on how structured the test is. Objective tests are those in which the items are highly structured such as true or false items, multiple choice items, or rating scales. Here, the test taker is required to respond within the given set of response options. Projective tests use items that are unstructured. Here, the items are often ambiguous such as ink blots, pictures, or incomplete sentences. The client is not required to respond in as structured a manner as objective tests demand.

2.2.3.5. *Interpretation of test scores.*

Another classification of tests is based on how test scores are interpreted. For some tests, scores obtained on the test are interpreted against the performance of a large group of people on that test. Here, the test is first administered to a large group that is representative of the people for whom the test is intended. Most attributes are distributed in a bell-shaped normal curve wherein the highest number of individuals clusters around the centre of the curve and the number gradually decreases in both directions towards the extremes. The scores of this group are interpreted by a measure of central tendency, the most common of which is the mean. Further, the standard deviation is calculated to identify the extent to which an individual's score

differs from the group mean. The individual's performance is then compared against the performance of this sample. This set of scores against which the comparison is made is called a norm and such tests are called norm-referenced tests. On the other side are criterion referenced tests wherein the performance of a person on the test is interpreted against some external standard or criterion (e.g., teacher's knowledge of the student).

2.2.4. Assumptions of psychological testing.

Psychological testing is based on many assumptions. Cohen and Swerdlik (2005) list some of the key assumptions:

- Tests measure what they purport to measure. This is called validity.
- The test scores will remain stable over time. This is referred to as reliability. This implies that the individual's behaviour too will remain stable over time.
- Individuals understand test items similarly.
- Individuals can report accurately about themselves. Tests assume that individuals can remember accurately and can assess and report their thoughts and feelings accurately. This is particularly so for tests that use the self-report method.
- Individuals will report honestly about their thoughts and feelings. Even when people can assess their thoughts and feelings accurately, they may choose to not report them accurately. They may instead give responses that are socially acceptable or even lie to skew the test results toward what they consider beneficial for themselves.
- For ability tests, the scores obtained by the individual reflect his or her ability plus some error. This error may be due to factors not related to the attribute being measured such as the environment, the test giver, the test taker, or the test itself.

2.2.5. Commonly assessed constructs in career counselling.

Some of the constructs that have been commonly assessed are interests (e.g., Strong Interest Inventory; Strong, Hansen, & Campbell, 1985), aptitudes (e.g., Differential Aptitude Test; Bennett, Seashore, & Wesman, 1956), personality (e.g., Myers-Briggs Type Indicator; Myers & Briggs, 1962), social cognitions (e.g., Career Belief Patterns Scale; Arulmani, 2008), and career thoughts (e.g., Career Thoughts Inventory; CTI; Sampson, Peterson, Lenz, Reardon, & Saunders, 1996). Two of these constructs, namely, interests and aptitudes have been most commonly researched for their role in career choice making. This research focuses on these constructs.

2.2.5.1. *Interests.*

Interests have been defined as ". . . motivations that determine life decisions" (Walsh, as cited in Dik & Hansen, 2008). Arulmani (2014b) defines interests as activities that a person enjoys, considers worthwhile, and wants to explore further. Many of the earliest career guidance systems such as that of E. K. Strong and John Holland were built on the assessment of interests. These approaches rested on the assumption that interests are stable over time. A meta analytic study conducted by Low, Yoon, Roberts, and Rounds (2005) to quantitatively assess the stability of interests, revealed that interests seemed to become stable between early adolescence to middle adulthood, and hence tend to be an important influence on the educational and occupational pathways that people choose.

2.2.5.2. *Aptitude.*

The second important pillar on which career guidance is based is aptitudes. Like interest, aptitude too has been researched extensively in terms of its structure and importance in the career guidance process. Aptitudes ". . . reflect how *likely* [emphasis in original] an individual is to be successful in the performance of a certain

task" (Arulmani, 2014b, p. 613). A review of job performance research revealed that tests of ability seemed to predict performance in almost all types of jobs better than any other type of predictor (Gottfredson, 2003).

2.2.5.3. *Interests or aptitudes: Which is more important?*

Arulmani (2014b) brings up the issue of the controversy in interest and aptitude testing in the field of assessment for career counselling. He narrates how career assessment started with aptitude testing as a response to the call of the labour market to identify people with skills required for the jobs available during the Industrial Revolution. However, as the field grew, assessment of interests became a part of the process of career counselling. Arulmani explains how the inclusion of interests in the assessment process was fuelled by the shifts in the political and philosophical standpoints during early to the mid-20th century.

This research focuses on the assessment method that is part of a particular method of career counselling, namely the *Jiva* approach to career and livelihood planning. The next section describes the main components of the Jiva method as well as the rationale behind the choice of this method.

2.2.6. The Jiva method of career counselling.

Jiva is an approach to career counselling that was designed to address the career development and livelihood planning needs of students from high school to higher secondary school specific to the Indian context (Arulmani, 2009, 2010). The following sections highlight some of the main components of the Jiva method.

2.2.6.1. *Approach to assessment.*

The Jiva approach makes two important contributions to the assessment of interest and aptitude. The first unique point, which is also an important contribution to the career counselling literature, is the concept of *potential*. Most career

counselling methods focus only on one of the two pillars described earlier, that is, interests or aptitudes. In methods that assess both, instruments to assess interests and aptitudes are often based on different theoretical frameworks and hence, do not yield readily useful information to the person receiving career counselling (Ackerman & Beier, 2003; Arulmani, 2014b). Assessments based on different theoretical frameworks may inform a person about his/her interests and abilities but restricts him/her from utilising this information in the career choice process. Arulmani (2014b) points out that few studies ". . . have investigated interest-aptitude relationships within the *same* [emphasis in original] construct, based on the same theoretical reference point" (p. 618). Arulmani's (2014b) Jiva approach to career and livelihood planning proposes the construct of *potential* which the author describes as the overlap between a person's interests and aptitudes. The notion of potential presents us with a construct whereby the interests and aptitudes of a person can be viewed from a single perspective and thereby integrate both interests and aptitudes into the career choice process.

The second unique point of the Jiva approach is that it takes a mixed methods approach to assessment. The Jiva method uses assessment methods that are a blend of quantitative (psychometric tests) as well as qualitative (analysis of qualitative data such as hobbies and accomplishments) methods. The method aims to tie in with the person's lived experience. It encourages the counsellor to dialogue with the client and guide him or her toward identifying and rating relevant aspects of his or her experiences. At the same time, it uses the psychometric logic of a rating scale to provide the counsellor an objective frame of reference. Arulmani (2014b) adopts a profile approach in the assessment of multiple potentials.

2.2.6.2. *Framework for assessment.*

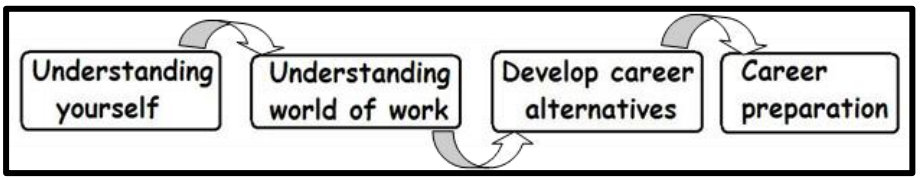
The Jiva method of career counselling bases its concept of potential on an assessment of interests and aptitudes within the same theoretical framework, namely, the Multiple Potentials Framework (Arulmani & Nag-Arulmani, 2004). This framework is adapted from Gardner's (1983) Theory of Multiple Intelligences. Gardner proposed the idea of multiple intelligences in his book *Frames of Mind: The Theory of Multiple Intelligences*. Describing the existing notion of intelligence (based on IQ) as being limited, Gardner proposed that intelligence can be differentiated into specific modalities. The Multiple Potentials Framework, adapted from this theory, looks both at interests, aptitudes, and thus, potential, as falling under five categories: Linguistic, Analytical-Logical, Spatial, Personal, and Physical-Mechanical. The Linguistic potential reflects orientation to language related activities. It indicates interests and abilities such as manipulation of words and expressions, fluency with language, sensitivity to word meanings, verbal reasoning, and ability to convert ideas and thoughts to words. The Analytical-Logical potential reflects skills related to application of logic and reasoning. It implies orientation to activities such as analysing data, identifying patterns and trends, making predictions, finding cause-effect relationships, and solving numerical problems. The Spatial potential reflects ability to visualise and convert ideas into concrete forms. It is manifested as skills related to drawing, art, sensitivity to colours, designs, shapes, and forms. The Personal potential indicates orientation to interact and work with people. It is reflects skills of understanding self and others, ability to analyse people's thoughts and behaviours, and influence them. The Physical-Mechanical potential indicates orientation to machines and physical activities. It reflects understanding of mechanical logic, skill to work with tools and equipment, skill of physical

coordination, and ability to use strength and stamina. The Jiva method adopts an "intra-individual approach" (p. 617) which emphasizes the relative ranks procured by the individual for the five areas. The aim of the assessment is not to identify how high a person's score is, rather it is to identify the pattern of scores across the five factors. This approach lays greater emphasis on the shape rather than the height of the individual's potential profile. The objective is not norm-based comparison but rather a person-centered description.

2.2.6.3. *The Jiva methodology.*

The Jiva method of career counselling is executed in the form of a workshop which is a collection of a set of activities based on four key themes: Self-Understanding, Understanding the World of Work, Developing Career Alternatives, and Career Preparation (as shown in Figure 1 below). Together these key elements are described as the *Career Discovery Path*.

Figure 1
Career Discovery Path (Arulmani, 2009, 2010)



Activities are supported by the Jiva Kit – a compendium of career development materials such as student worksheets, learning cards, flip charts, career dictionaries, and career information cards. The activities and materials of the Jiva Kit have been designed in such a way as to promote student-led learning. The workshop activities are flexible and can be implemented as a one, two, or three day workshop.

2.2.6.4. Validation of the Jiva methodology.

Tracer studies. A three-year post intervention review of 891 students (Arulmani, 2004), who had gone through the Jiva programme as high school students between 2001 and 2004, showed the following:

- 83% of this sample had opted for careers that had been suggested to them after the Jiva programme and were successfully pursuing either a course or jobs in these fields.
- Semi-structured interviews with 156 individuals from this group indicated that participants reported that they had a greater insight into their potentials, higher self-confidence, and felt prepared to make better reasoned career choices. They had successfully completed their courses and were fruitfully employed, or they were pursuing further education.

Quasi-experimental intervention studies. A doctoral study (Sangma, 2014) tested the Jiva programme through a quasi-experimental waiting-list control study with a sample of 492 male and female high school students in rural and urban areas of Meghalaya. Post-intervention assessment indicated that career preparation status, career belief patterns, and academic achievement motivation levels improved to statistically more significant levels amongst the intervention group (individuals who received the Jiva programme) than the control group (individuals who did not receive the intervention). Another doctoral research presently in progress in Maharashtra is also finding similar trends amongst rural students, using a local language version of the programme (Joshi, 2017). A study of the effectiveness of the Jiva method within a school setting showed that students' self-knowledge and skills to mediate the world of work improved after the intervention (Supreeth & Aravind, 2016). The most recent evaluation of outcomes of the Jiva method with 883 students in government high

schools showed a statistically higher improvement in the career preparedness scores of the experimental group when compared with the control group (Arulmani, Miranda, & Buela, 2018).

Vetting by external agencies. The Jiva approach has been presented to representatives of 32 countries through international conferences, workshops, and public lectures and through sensitisation workshops conducted by the International Labour Organization (ILO, 2013). The Jiva method has been successfully adapted for use in other countries such as Maldives (Arulmani, 2006), Vietnam (Arulmani, 2014c), Sri Lanka (Arulmani, 2016), and Nepal (Arulmani & Aravind, 2017-2018). The assessment system developed by the Jiva method has been adopted for use with immigrants in Sweden (Arulmani, 2015b).

2.2.6.5. *Rationale for selection of the Jiva method for this research.*

As shown in the section above, external investigations of the Jiva as well as its acceptance in other countries point to its reliability. Based on this evidence, the Jiva method was selected for this research for the following reasons:

- The Jiva approach was developed and designed to address career development in the Indian context. Hence, the programme is culturally suited to the context of the students in the sample of the study.
- As described above, the assessment method in the Jiva programme follows a profile approach. The objective of the assessment is not norm-based comparison but rather a person-centred description. This means the outcomes of the assessment are not interpreted against norms. Such an approach is important for this study because, as shown in the review of the literature, the manner in which dyslexia manifests is individual specific. There is no single standard against which an individual can be fairly compared. Hence, this study takes a person-

centred, rather than a norm-referenced approach. The Jiva approach as well, is based on such an understanding of the individual's potentials.

- The researcher is trained in the Jiva method of career counselling and is a practitioner as well as a trainer in the Jiva method.

The next section describes the need for career counselling for children with dyslexia and then moves on to challenges in assessment for career counselling of children with dyslexia.

2.3. Need for Career Counselling for Children with Dyslexia

Children with learning disabilities experience career developmental needs similar to that of their typically-developing peers. But their disability also presents them with career development challenges that are different from that of their non-affected peers.

Academic weakness is commonly associated with learning disability and is often the first strong indicator of the presence of a learning disability. Children with learning disabilities are not able to perform well academically despite their putting in more effort compared to their typically-developing peers. Consistent academic underperformance is very commonly perceived as a barrier to successful entry to higher education and thereby into the world of work (Aravind, Sailo, Nag, & Arulmani, 2011; Hitchings et al., 2001; Nag, 2014). One reason for poor academic performance could be the large amount of time spent by children with learning disabilities on remedial activities. For example, Hitchings and colleagues (2001) point out that investment of time for remedial activities reduces the amount of time available for children in the high school years for career exploration and preparation.

Insensitive evaluation practices in schools further add to the academic challenges experienced by the children (Nag, 2014).

Attitudes related to their disability could also be seen as a challenge for children with dyslexia. For example, Yanchak, Lease, and Strauser (2005) studied career and career-related thoughts in children with disabilities drawing on a sample of 90 individuals of which 46 had a cognitive impairment (28 students had a learning disability and 15 were diagnosed with traumatic brain injury) while 44 had a physical impairment. The study found that individuals with cognitive disabilities had significantly more decision-making confusion and external conflict (conflict between own thoughts and what others wanted for them) related to career decisions than individuals with physical impairments.

Also, affecting the career development of children with learning disability are the lowered expectations of teachers and parents. Many parents tend to become overprotective and take over decision-making for their children regarding career choices (Hitchings et al., 2001; Nag, 2011). Teachers and parents often do not encourage children with learning disabilities to take up sciences since they believed that employers in these fields are less likely to hire them (Alston, Bell, & Hampton, 2002). Nag (2014) reported that the inability to be assertive and the tendency to give up easily were common experiences among children with learning disability. She noted that influences at multiple levels (e.g., family, school, special educators,) can ". . . smother reflection among individuals and reduce their own say in the decision making" (p. 507).

A study of college graduates with learning disabilities who were academically successful (as indicated by their GPA) found that it was their ability to construct a profile of their strengths and weaknesses, that helped them take career decisions

which in turn contributed to their success (Anctil et al., 2008). The importance of knowledge about one's abilities, strengths, and weaknesses in empowering children with learning disabilities to make career decisions is also highlighted by Nag (2014) in her research. This is especially important in the Indian context where it has been found that career related decisions of children with learning disabilities are often taken over by the adults in their lives. This can, in the future, lead to a decreased congruence between the person's interests, abilities, and aspirations and thereby in the quality of their career choices, as well as poor ownership of decisions made on the part of the student (Nag, 2014).

Thus, looking beyond academic weaknesses and helping children with learning disabilities to identify their strengths and abilities should be a key career counselling target. This brings us to the importance of career assessment for children with learning disabilities.

2.3.1. Challenges in assessment for career counselling for children with dyslexia.

While assessment is an important step within career counselling for any target group, its use for children with dyslexia should address certain special considerations. This is because most tests that are available are not developed for and hence do not account for the needs of children with dyslexia.

A comprehensive review of the literature pertaining to career and career-related educational concerns of college students with disabilities was conducted by Enright et al. (1996). One of the areas explored in this literature review was access and accommodation issues. The review points to three areas of concern: (a) accessibility of career services, (b) appropriateness of assessment procedures, and (c) the scope of career guidance. These authors indicate that one of the main challenges in assessment is that existing tools used in the career counselling process are developed for

individuals without disabilities. Such tests do not include individuals with disabilities in their standardisation samples and hence the norms developed for these tests may be invalid for people with disabilities.

Another challenge these authors point to is that many existing tools, being based on interests, yielded a "flat" profile when used with people with disabilities due to their limited life experiences. An example to illustrate this is a study that explored the use of a standardised test on vocational assessment for children with learning disabilities (Winer, Pierce, & Wilson, 1988). The standardised test used in this study is the Self Directed Search-Form - E (SDS-E) which was an alternate form of the SDS developed by Holland for children and adults with difficulties in reading. The SDS-E uses a vocabulary level that is lower than that used in the SDS. This study was conducted with 25 children with learning disabilities studying in junior and senior high school in a rural school district in Southwestern United States. Twenty-one students in the sample had learning disabilities while four had multiple disabilities. The mean age of the sample was 15 and the students were selected for the study by the special education counsellor based on the perceived need for vocational assessment and judged capacity to respond to an English language, paper-and-pencil instrument. The students had varying levels of fluency in English and Spanish. Their average reading level as measured by the Wide Range Achievement Test was 5.9 years and average IQ was 84 as measured by the WISC or WAIS. In the study, the SDS-E was partially self-administered. This means that while the students were asked to read and respond to the test items, they were allowed to ask for assistance if confused by the instructions or unfamiliar vocabulary. It is important to also note that the students in the study had high academic skills when compared to other students in the school, as indicated by their reading levels and intelligence. However, the study

observed that students repeatedly raised doubts about meanings of particular words and phrases. They obtained lower scores on the SDS-E as compared to high school normative data presented by Holland. Responses on a particular scale of the SDS-E also indicated that these students had a restricted range of life experiences and fewer opportunities to develop interests and skills.

Studies such as these indicate that standardised tests when administered to individuals with disabilities might require the application of accommodations. Accommodations refer to adjustments or modifications made in testing formats to, at least partially, bypass limitations imposed by disability. Developing such accommodations is a key objective of this study and this construct is discussed in more detail in section 2.3.2.below.

In reviewing the appropriateness of assessment tools for people with disabilities Enright et al. (1996) point out that there is little research that explores the effect of accommodations on the test scores and this in turn affects interpretation of the test scores. It is also to be noted that in some cases, the accommodation can have a direct effect on the test construct that is being assessed thereby affecting the validity and reliability of the test result. An important recommendation made by Enright et al based on these findings is that the expertise of a professional is sought when considering the impact of an accommodation upon test interpretation when assessing students with disabilities. Another recommendation is to empirically test the impact of accommodation on test interpretation and to report any modifications when drawing conclusions from the test. Enright et al. (1996) have listed the following guidelines for counsellors who administer tests for students with disabilities:

- Consult with students regarding their need and desire for accommodation.

- Refer to students' individualised education plan (IEP), if available, to know the past accommodations availed.
- Use and advocate criterion referenced over norm referenced tests to avoid possible comparisons to inappropriate normative groups.
- In case flat profiles are obtained, encourage work and leisure experiences such as part time paid work, volunteer work, job shadowing, extracurricular activities to broaden their interests.
- Assess how counsellor's perception of student's disabilities may be affecting evaluation of their potential.
- Keep students' disability and record of accommodation confidential.
- Advocate data collection from multiple and alternative sources of information.

The next section explores the concept of accommodations and their impact on testing children with disabilities.

2.3.2. Accommodations in testing.

Often, alternate formats of assessment, are used to assess individuals who, as a result of their disability, cannot participate in regular assessments. These special adjustments are termed as *modifications* or *accommodations.* Cohen and Swerdlik (2005) give examples of such accommodations:

1. The form in which a test is presented, for example, verbally administered test for a person with visual impairment

2. The way in which responses are elicited, for example, when a speech impaired person is given the option of indicating his/her answer by pointing

3. The physical environment where the testing takes place, for example, providing special furniture for persons with orthopaedic impairments

4. The interpersonal environment where the testing takes place, for example, allowing a helper to be present for individuals with severe difficulties in movement

Common assessments formats used for people with disabilities are oral administration, large print or braille format; individual administration; use of an interpreter; use of word processor or non-written methods to record responses, provision of extra time or additional breaks, use of adjustable desks to accommodate when chairs are not suitable (Enright, Conyers, & Symanski, 1996).

A study done at the National Center on Educational Outcomes illustrates this point (Johnstone, Liu, Altman, & Thurlow, 2007). The study aimed at understanding how modifications made on test items affected its readability for children with learning disabilities. An overall finding of the study was that modifying test items improved the chances of children giving the correct answer from 46% to 72%. Closer examination of responses to each item gave further information. Some types of modifications were found to be more effective than others. For example, modifications such as lowering vocabulary level (e.g., substituting complex, unfamiliar words with simple, commonly used words) and removing prefixes (e.g., negative prefix such as *dis*) were found to be more helpful. Other modifications like reducing the text load (reducing the number of words in an item) and presenting the text with a bold typeface did not improve the readability of the item for the children. Another important finding of this study was that for most items, the source of the error was the flawed reading strategies of the children. This indicates that although modifications can be made to verbal tests to make them more readable and comprehensible, the verbal nature of the test itself seems to be a challenge to people with learning disabilities.

Accommodations, as part of educational and career assessment, are well established in some countries. For example, a guide for professionals offering educational and career related services prepared by the National Collaborative Workforce for Disabilities in Washington DC, United States stresses the importance of seeking accommodations at different levels for children with disabilities (Timmons, Podmostko, Bremer, Lavin, &Wills, 2005). This includes accommodations in school, during assessments, in training, and work settings.

Sireci, Li, and Scarpati (2006) conducted a review of literature to identify studies that investigated the effect of accommodations on test performance. This study reviewed 40 papers of empirical studies of the effect of test accommodations on the performance of students with disabilities or English language learners conducted between 1986 and 2001. The subjects of these studies were between Grades 3 to 12 and included students with disabilities (visual and hearing impairments and physical and learning disabilities) and English language learners. These were all students taking standardised tests. The most common accommodations in these studies were oral administration of the test (31% studies) and extra time (20% studies). Other less common accommodations were change in test presentation (Braille or sign language), change in test response format (scribe or transcription), and change in settings (separate room). A consistent finding from all the studies was that accommodations such as extended time improved the performance of the students with disabilities more than it improved that of students without disabilities. Another important finding from this study is that there was a great amount of diversity amongst students with disabilities. This diversity combined with the different ways in which a single accommodation can be implemented made it difficult to make broad generalisations about the effects of a specific type of accommodation on a specific type of student.

It is important to understand how we can assess children with learning disabilities in a sensitive yet effective manner. In listing the important skills that career guidance professionals should keep in mind when working with children with learning disabilities, Nag (2014) highlights the importance of being able to assess individuals and to adapt standardised tests in order to collect meaningful data and to identify the person's potential through means beyond academics. Nag (2014) goes on to explain that difficulty with reading speed, for example, can have implications on the child's suitability to take a timed test.

2.4. The International Classification of Functioning, Health and Disability - Children and Youth Version (ICF-CY)

An important point that arises from the foregoing review is that assessing the nature and severity of learning difficulties is as important as identifying interests and aptitudes. Here, a learning skills profile can serve two important functions in the career assessment of children with learning disabilities: (a) to realistically appraise the suitability of certain courses and careers, and (b) to evaluate the suitability of certain assessment formats such as tests. This study uses the ICF-CY to inform the development of a Learning Skills Profile Tool.

The ICF-CY is a multipurpose classification system developed by the World Health Organization (WHO, 2002) that helps to classify and measure levels of functioning in the context of disability. As shown in Table 2 below the ICF-CY is divided into four main components: body structures (listing the main structures of human physiology), body functions (listing the primary function of each body structure), activity and participation (tasks executed by an individual or involvement in a life situation), and environmental factors (physical, social, and attitudinal

environment in which people live, that can serve as facilitators or barriers to functioning).

Table 2

Overview of the International Classification of Functioning, Disability and Health-Children and Youth Version (ICF-CY) Extracted from WHO, 2002

Body Structures	**Body Functions**	**Activity and Participation**	**Environmental Factors**
s1-Structures of the Nervous System	b1-Mental Functions	d1-Learning and Applying Knowledge	e1-Products and Technology
s2-The Eye, Ear and Related Structures	b2-Sensory Functions	d2-General Tasks and Demands	e2-Natural Environment and Human made changes to Environment
s3-Structures involved in Voice and Speech	b3-Voice and Speech Functions	d3-Communication	e3-Support and relationships
s4-Structures of the Cardiovascular, Immunological and Respiratory Systems	b4- Functions of the cardiovascular, haematological, immunological and respiratory systems	d4-Mobility	e4-Attitudes
s5-Structures related to the Digestive, Metabolic and Endocrine Systems	b5- Functions of the digestive, metabolic and endocrine systems	d5-Self care	e5-Services, Systems and Policies
s6-Structures related to the Genitourinary and Reproductive Systems	b6- Genitourinary and reproductive functions	d6-Domestic life	
s7-Structures related to Movement	b7-Neuromusculoskeletal and movement-related functions	d7-Interpersonal Interactions and Relationships	
s8-Skin and related structures	b8-Functions of the skin and related structures	d8-Major Life Areas	
		d9-Community, Social and Civic Life	

Each of the four components shown in Table 2 is arranged in a hierarchical order (component-chapter-second level domain-third level domain-fourth level domain). The classification is divided into chapters. For example, under the component body functions (b) one of the eight chapters is called mental functions (b1). Chapters are then divided into four domains. For example, under the chapter mental functions (b1), one of the second level domains is called mental functions of language (b167), further under which one of the third level domains is called reception of language (b1670), under which one of the fourth (and final) level domains is called reception of spoken language. Further, as per the ICF-CY, information can be collected from multiple sources such as standardised procedures and tests, assessment instruments, observation, interview with person or proxy, standardised or non-standardised questionnaires, or written materials provided by the person or proxy. The individual's functioning is assessed in three dimensions: frequency, intensity, and effect.

Thus, the ICF-CY is a tool that can be used to understand disability across the lifespan at the level of the body, the individual, and the environment, through a functions rather than a deficits perspective. The Learning Skills Profile Tool, an integral part of this research, was developed using the ICF-CY framework. This development is reported in detail in the next chapter.

The next section explores another important construct in this research, namely, the case study method**.**

2.5. The Case Study Method

This research has adopted the case study method. The study examines six students with dyslexia in depth, to understand the nature of their test-taking

difficulties as well as to identify contextual factors that might have influenced the test-taking process. A question that could arise here pertains to the validity of the results obtained and the generalisability of the findings given the small number of students that were studied. This section develops a rationale and provides a rationale for the use of the case study method.

The case study method is used in research to study a phenomenon in its context. According to Yin (2009), the case study method is used when (a) the researcher needs to address *how* and *why* questions in the research from an idiographic view point, (b) when the researcher has little control over events being investigated, and (c) when the research focuses on a contemporary phenomenon in a real life context. Yin (2009) goes on to provide four applications of the case study method research: (a) to explain presumed causal links in real life interventions that are too complex for survey or experimental designs, (b) to describe an intervention and a real life setting in which it occurred, (c) to illustrate certain topics within an evaluation, in a descriptive mode, and (d) to enlighten those situations in which the intervention being evaluated has no clear, single set of outcomes. As detailed below, each of these applications fit closely with the objectives of the present research.

The case study method is characterised by the use of multiple sources, for example, documents, artefacts, interviews, and observations, to gather information about the phenomenon under investigation. This allows for the phenomenon to be understood from multiple perspectives. The present research draws upon a wide range of data sources including data gathered from psychometric tests, interview with parents and students, and examination of students' assessment reports. A unique feature of the case study method is that the researcher can collect both quantitative as well as qualitative data which can be triangulated with one another. This not only

provides more strength to the findings but also provides a more holistic understanding of the phenomenon under investigation (Baxter & Jack, 2009). The present research collects both quantitative as well as qualitative data about the six students with dyslexia under study. With a view to comparing the performance of the six cases with their peers, this research also includes data from a much larger sample of students without dyslexia.

Zainal (2007) summarises the advantages of the case study method. The first advantage cited is that unlike experiments, in the case study method, the data is examined within the context of its use. The data obtained through present research is examined within the context of test-taking for career guidance. The second advantage is how different case study approaches allow for quantitative and qualitative analyses of the data. As detailed in the following paragraphs, the present research elicits and blends quantitative with qualitative data. Thirdly, the qualitative information collected through case studies not only help to explore the data in real-life settings but also acknowledge the complexities of real life situations that cannot be captured using other methods like experiments or surveys. Students with dyslexia have to engage with assessment systems that are part of much wider and more complex pedagogical system. Hence the present research found the case study approach to be most suitable aligned to its objectives.

Case studies have been criticised and often considered a less rigorous form of research. Yin (2009) lists out four main criticisms directed against the case study method. The first reason is a perceived lack of rigor with this method due to the lack of specific procedures compared with surveys and experiments. The present research attempts to counter this criticism by approaching each of six cases in the study with identical procedures and methods. The second criticism cited is that the case study

method provides little basis for generalisation. However, Yin (2009) counters this criticism by postulating that case studies are not aimed at statistical generalisation, that is, to enumerate frequencies, but rather to analytic generalisation, that is to expand and generalise theories explaining the phenomenon. The present research does not set statistical generalisation as its objective. Instead the aim is to analyse each case and extract key principles related to improving the test-taking experience of students with dyslexia. The third criticism directed toward case studies is that they take long to complete. Yin (2009), however, argues against this point citing that case studies are often confused with ethnography or participant observation. He argues that case studies need not necessarily include ethnographic or participant-observer data, and hence may not take long amounts of time to collect data. The final criticism has to do with the emphasis placed on randomised field trials and experiments as higher forms of research as they seek to establish causal relationships. This has led to downgrading of case studies that do not emphasise such objectives. The objective of the present research is not to establish causality. Instead the aim is to look for trends and patterns that could inform the career counselling process.

There are two main variants of the case study method, that is, the single-case study and the multiple-case study. The *case* in a case study method can be an individual, an institution, an event, or a program. When one such unit is studied, it constitutes a single-case study whereas when multiple units or cases are studied, it constitutes a multiple-case study method. An important question in case study research is identifying what the case is. Baxter and Jack (2008) recommend asking questions such as: Do I want to "analyze" the individual? Do I want to "analyze" a program? Do I want to "analyze" the process? Do I want to "analyze" the difference between organizations? The authors also warn against the common error of

researchers attempting to use the case study method to answer a question that is too broad or having too many objectives. This highlights the importance of placing boundaries on a case to ensure that the objectives of the study remain attainable in its scope (Yin, 2009). This is similar to the application of inclusion and exclusion criteria for sample selection in a quantitative study. However, these boundaries go further from defining the sample to also defining the breadth and depth of the study (Baxter & Jack, 2008).

In general, the multiple-case design is considered to be stronger than the single case design since evidence from multiple cases is seen to be more compelling and hence considered to be more robust. A common temptation in the case study method is to study everything about the individual (Flick, 1998, Yin, 2009). Hence, it is important in case study research to use the research questions to define the unit of analysis, that is, the case. The research questions could lead to choosing a particular unit of analysis over another. However, it may also be noted that the chosen unit of analysis may change during the course of the research with new discoveries from the data collection. Flick (1998) differentiates between theoretical sampling that is used in case studies as opposed to statistical sampling that is used in experiments. In theoretical sampling, cases are selected according to their (expected level) of new insights for the developing theory, in relation to the state of theory elaboration so far (Flick, 1998). The selection of the six cases for the present research rests upon the rationale of theoretical sampling.

It is also important to note that it is not the intention of the case study method to generalise results found from the case studies to the population that the cases are a part of. Yin (2009) differentiates between analytic generalisation and statistical generalisation. Statistical generalisation occurs when ". . . an inference is made about

a population (or universe) on the basis of empirical data collected about a sample from that universe" (Yin, 2009, p. 38). However, in case studies, unlike surveys and experiments, *cases* are not sampling units that are representative of the universe. To the contrary, cases are chosen according to the manner in which the researcher defines the case for the purpose of the study. For example, in a single case study, the researcher might choose to study a case that represents the extreme of a phenomenon that is under study. Findings from such case studies do not intend to be replicated for a population. By contrast, in an analytic generalisation that results from case studies, ". . . a previously developed theory is used as a template with which to compare the empirical results of the study" (Yin, 2009, p. 38). In multiple cases, the manner in which the cases support the theory is linked to the replication of the theory. If the cases show contrasting findings, with two or more cases supporting one theory but contradicting a rival theory that can explain other cases in the study. Yin argues that case study method is not used for generalisation due to the following reasons:

1. The case study method is not suitable for assessing the prevalence of a phenomenon.
2. Since the case study method focuses on the phenomenon and its context, it would require a large number of cases to allow any statistical consideration of the relevant variables.
3. Many important topics could not be empirically studied if it required following a sampling logic.

The multiple case study design has been used in this research for the main reason that this study was interested in exploring the number of different profiles that can be seen in children with dyslexia. Since there are no classifications of children with dyslexia, the case number was not fixed at the start of this research. In the present

study, the researcher used the case study method to explain *why* a particular type of accommodation could have improved or not improved his or her performance on the aptitude test. The case studies in this research also attempt to use the larger picture of the students' childhood history, family background, and educational history to explain test-taking behaviour. The study required the researcher to collect both qualitative and quantitative information. Quantitative information collected through aptitude tests was required since a main objective of the study was to assess performance of students' with dyslexia on standardised tests and with accommodations. At the same time, information gathered from the literature review, the exploratory phase of the study, as well as interviews with the members of the expert panel indicted that various contextual factors related to the child's educational background, previous experiences with tests, family attitudes towards the disability could affect experiences of test-taking. Hence, the study required the researcher to collect both quantitative and qualitative information.

As shown in the discussion above, profiles of dyslexia vary across individuals. Therefore, a survey method may not have been suitable for the purposes of this study. Analytic, rather than statistical generalisation lies at the heart of this study. Against this background, the case study method was selected as most appropriate for this research.

2.6. Conclusion

Career assessment is necessary to identify strengths and interests that one can capitalise on. However, as this review has demonstrated, the effectiveness of career counselling for persons with dyslexia is closely linked to the appropriateness of the assessments systems used. The language and cognitive challenges that characterise

dyslexia make many of the current assessment methods unsuitable for children with dyslexia. However, when the assessment method is suitable, career counselling can play an important part to not only identify suitable career options but also to identify personal potentials and navigate barriers to increase participation in the society. However, as Aravind and Nag (2014) point out, merely assessing interest and aptitude is not sufficient in the case of students with dyslexia. Against the backdrop of the Jiva method, the authors argue how the Learning Skills Profile Tool and the MPT-5 should be used together. The use of the MPT-5 will yield a potential profile that will reflect the students' high potential areas. However, it seems this must be preceded by the use of the Learning Skills Profile Tool in order to understand the student's learning skills profile and understand what accommodations must be offered to the student when administering the MPT-5. The potential profile and the learning skills profile must function as two complementary frameworks of career assessment for children with learning disabilities (also see Aravind, Nag, & Arulmani, 2015). The aim of this research is to develop a method of career assessment that is sensitive to the test-taking difficulties of children with dyslexia.

Chapter 3

Methodology

This research focuses on the assessment of the potentials of children with dyslexia for the purpose of helping them make effective career choices. This chapter describes the various steps and stages this research followed. As reported in the first chapter, the background to this study emerged from the researcher's experience as a counselling psychologist working with children with dyslexia. This may be considered as the exploratory phase of the study, which led to the main research questions. The main study was conducted between 2013 and 2017 with data collected from Bangalore (Karnataka), Kannur (Kerala), Hosur (Tamil Nadu), and Bongaigaon (Assam).

This chapter focuses on the designing of the main study, rationale for sampling, and sampling procedures used, variables examined and controlled, details and rationale for the tools used and the tools constructed, and the approach to assessment and data analysis.

3.1. Exploratory Phase

The researcher's first attempt at understanding the career developments needs of children with learning disabilities focused on developing an impression of the main barriers they faced with regard to their career preparation (Aravind et al., 2011). This study identified barriers such as poor academic record, low confidence levels, anxiety about competing or being compared with students who do not have learning disabilities, and significant others' lack of awareness of special needs. A key learning that emerged from this initial study was that identifying their strengths and weaknesses was important in helping the students to face their challenges. Based on

this initial field experience, the researcher, during the course of her work as a career counsellor, noticed that for some students, awareness of their talents and interests helped them not only to plan for their careers but also brought about an increase in their confidence and wellbeing. Such self-knowledge helped the students to look beyond their deficits (related to the learning disability) and identify areas of strengths that they could build on. This is reflected in the statement made by one student in the study: "I am learning so much more than I thought I would". This study highlighted the importance of the need for a career counselling programme for children with learning disabilities. Although this study is not a part of this present research, for the researcher this study was a stimulus to further engage with the career counselling needs of students with dyslexia. Hence, this may be considered as the exploratory phase which led to the present research. The main study was conducted between 2013 and 2017 with data collected from Bangalore (Karnataka), Kannur (Kerala), Hosur (Tamil Nadu), and Bongaigaon (Assam).

3.2. Objectives of the Study

Based on this initial field experience and a review of the literature, the following objectives were formulated for this research. The objectives are first listed and then explained in subsequent sections.

1. Compare the performance of high school students without dyslexia with the performance of students with dyslexia on the Multiple Potentials Test-5 (MPT-5) (Arulmani, 2005), a psychometric aptitude test that uses the paper-pencil format, to understand the difference, if any, between these two groups on the quality of their performance on a standardised, quantitative measure of aptitude.

2. Construct the Tests and Me Questionnaire to gain a deeper understanding of level of difficulty experienced by students with dyslexia when performing on the MPT-5.
3. Use the International Classification of Functioning, Disability, and Health-Children and Youth version (ICF-CY; WHO, 2002) to construct a Learning Skills Profile (LSP) Tool that can be used to develop individualised learning skills profile for students with dyslexia.
4. Examine the level of difficulty experienced in test-taking amongst students with dyslexia by administering two alternate forms of the MPT-5 using two kinds of accommodations, namely, the Extended Time Form and the Oral Form of test administration.
5. Examine the relative effectiveness of the two accommodations by drawing upon data from the LSP, a re-administration of the Tests and Me Questionnaire, and a comparison of students' performance on the two alternate forms of the MPT-5.
6. Use the findings to make recommendations on how the learning skills profile generated from the LSP Tool can help to identify what mode of accommodation is most effective to improve the performance and ease of test-taking amongst students with dyslexia.

Detailed discussions on the implementation of these objectives are presented in the following sections.

3.3. Designing the Main Study

This study is designed to examine the effect of one independent variable, namely, the mode of assessment, on two dependent variables: (a) the quality of the student's test performance as indicated by a change in scores obtained on the MPT-5

and the alternate forms, and (b) the level of difficulty reported by the student when taking the MPT-5 and the alternate forms. The literature also shows that factors such as developmental stage, schooling grade, socioeconomic status, and fluency in English are likely to be involved both in the overall career development as well as the assessment of children with dyslexia. Since these factors could have a confounding effect, they were controlled for the purposes of this study, by using exclusionary criteria. The study developed a baseline by administering the MPT-5 firstly to a sample of students who did not have dyslexia (Comparison Group) and then compared the performance of students with dyslexia (Study Group) with the Comparison Group. The Tests and Me Questionnaire was constructed to examine the level of difficulty in test-taking amongst students with dyslexia. A Learning Skills Profile Tool was developed to identify factors that could be controlled in order to improve the test performance of students with dyslexia. The most common forms of accommodations available to Indian students with dyslexia are the Extended Time and the Oral forms. Hence, these were the two forms selected for this research. Two modes of assessment were created based on these two forms of accommodations. The MPT-5 was re-administered to the students with dyslexia (Study Group) using both modes of assessment. Changes in level of difficulty in test-taking and resulting changes in scores on the MPT-5 were examined. The LSP Tool was used to identify which mode of accommodation is most effective to reduce difficulty in test-taking amongst each of the students in the Study Group. Convenience sampling was used to compose the Comparison Group while purposive sampling was used to identify members of the Study Group. An expert panel was composed to advise and validate the study design and the tests constructed for this research. Data analysis followed a mixed methods approach drawing upon statistical tools such as quartiles and *z* scores

and classroom observations, analysis of historical information, and interviews with key informants.

3.4. Sampling Procedure

As alluded to above, this research is based on a sample comprising two groups. One group consisted of children with no known history of dyslexia or other learning difficulties. This group was named as the Comparison Group. The second group consisted of children with a reliable diagnosis of dyslexia. This group was named as the Study Group. The following section describes these two groups in further detail.

3.4.1. Comparison Group.

3.4.1.1. *Rationale*.

Since the study aimed at comparing the performance of children with dyslexia against that of children without dyslexia on a standardised aptitude test, one part of the sample comprised a group of students without dyslexia or other learning difficulties. This group served the purpose of a comparative group, that is, a group against which the performance of the Study Group, children with dyslexia, was compared to understand how they are performing differently on the test.

3.4.1.2. *Selection criteria.*

The Comparison Group was matched to the Study Group on all factors except the presence of dyslexia. The following rationale was used to establish the selection criteria for this section of the sample:

1. This study was conducted entirely in English. Poor English fluency could affect students' performance on the tools of this study, since all tools were in English. The literature shows that children from middle and upper middle socioeconomic (SES) groups are more likely to be fluent in English than their lower SES counterparts (Aula, 2014; Ramanathan, 1999). Hence, only students from middle-

upper middle class homes were selected. SES was ascertained by identifying schools that catered to this socioeconomic class and examining parental occupation.

2. In the Indian education system, students start making crucial decisions about subjects and streams for further education during Grade 10 (high school) and Grade 12 (higher secondary school). Grades 9 and 11, respectively, are preparatory years. These students are also under less curricular pressure to prepare for the board examinations. Hence, students belonging to Grades 9 to 11 were selected for the study.
3. As indicated earlier, if the Comparison Group was to serve as a comparative group, the members of this group should have no known history of learning difficulties. This was ascertained in two ways. Firstly, students' school teachers were requested to identify any students whom they knew to have been diagnosed with any form of learning disability. Secondly, students who scored below Grade C (60% marks) in English were removed from the analysis since low academic scores, especially in language subjects, could be an indication of the presence of learning difficulties (Siqueira & Gurge-Giannetti, 2011; Thambirajah & Ramanujan, 2016).

3.4.1.3. *Sampling method.*

The original intention of the researcher was to compose the sample using the principles of randomisation. However due to reasons beyond her control, the researcher had to resort to convenience sampling. The reasons are explained in the section of Implementation of the Study below.

3.4.2. Study Group.

3.4.2.1. *Rationale.*

The Study Group comprises students with dyslexia. This is the group on whom the effectiveness of the standardised aptitude test was evaluated. The same rationale used for the composition of the Comparison Group, namely, middle and upper middle class SES, Grades 9 to 12 and fluency in English, was also used for the Study Group. In addition, the following selection criteria were applied.

3.4.2.2. *Selection criteria.*

The criteria followed for selection to the Study Group are listed below:

1. Students with a reliable diagnosis of dyslexia. This was ensured by establishing that the student had received the diagnosis from a reliable institute or from a qualified psychologist and by examining the assessment report of the professional who assessed the student.
2. Children with comorbid conditions that were present along with dyslexia were dropped from this study. Five such children (with comorbid conditions such as ADHD, eye problems, intellectual disability) were dropped.

3.4.2.3. *Sampling method.*

The sampling technique used here was purposive sampling. Students were selected for the Study Group based on the centre/school's willingness to participate in the study and the student's fit to the above mentioned selection criteria. This group consists of six children with a reliable diagnosis of dyslexia.

3.5. Variables.

The study examines the effect of one independent variable, namely, the mode of assessment, on two dependent variables: (a) the quality of the student's test

performance as indicated by a change in scores obtained on the MPT-5 and the alternate forms, and (b) the level of difficulty reported by the student when taking the MPT-5 and the alternate forms. These constructs are explained in detailed below.

3.5.1. Independent variable under study: Mode of assessment.

As mentioned earlier, the assessment tool being used in this study is called the Multiple Potentials Test-5 (Arulmani, 2005). This is a standardised paper-pencil test consisting of 150 items which assesses a person's aptitudes within a Multiple Potentials Framework. The test is described in more detail in the section on Tools. For the purpose of this study two alternate forms of this test were developed. One alternate form was a paper-pencil form with extra time allowance. The second alternate form was an orally administered version of this test. It is anticipated that the performance of the students in Study Group in the two modes would be differentially effective depending on the student's learning skills profile.

3.5.2. Dependant variables under study.

3.5.2.1. *Quality of test performance.*

By definition, children with dyslexia are the same as other children with regard to their general capacities (APA, 2013; https://icd.who.int/dev11/l-m/en). The ICD-11 Beta Draft specifies that the ". . . impairment in reading is not due to a disorder of intellectual development . . ." (https://icd.who.int/dev11/l-m/en). The DSM-V states that dyslexia is characterised by ". . . reading achievement (i.e., reading accuracy, speed, or comprehension as measured by individually administered standardised tests) that falls substantially below that expected given the individual's chronological age, measured intelligence, and age-appropriate education" (APA, 2013, p. 51). Hence students with dyslexia are likely to be similar to children without dyslexia on all other aspects of aptitudes and talents. At the same time, children with dyslexia experience

difficulties with reading, writing, and spelling. Standardised paper-pencil tests measure general capacities through the medium of language, which is precisely the area of difficulty experienced by persons with dyslexia. It is highly unlikely, therefore, that the results of conducting such assessments would be an accurate reflection of the true aptitudes of the person with dyslexia. Hence, one of the aims of the study was to determine whether the quality of the student's test performance improved such that higher scores were recorded on the administration of the alternate forms of the MPT-5.

3.5.2.2. *Extent of difficulty experienced in taking the test.*

With consistent intervention, many students with dyslexia learn strategies and skills to cope with the deficits in their reading and writing skills (Heiman & Precel, 2003; Kirby, Silvestri, Allingham, Parrila, & La Fave, 2008). However, test-taking remains a challenging task for children with learning difficulties. Children with dyslexia commonly report feelings of stress, nervousness, frustration, helplessness, and uncertainty with test-taking (Aravind, et al., 2011; Heiman & Precel, 2003; Sena, Lowe, & Lee, 2007). These feelings are associated with concerns such as concentrating on the test, completing the test on time, or performing well on the test. Hence, one of the ways of measuring effectiveness of a test was to assess the level of difficulty the student reported when taking any particular form of the test.

3.6. Expert Panel

A panel of experts of 11 individuals was composed to play the role of advisors as well as to vet the tools constructed for the study. This is a multi-layered study drawing both from the field of testing and assessment as well as from the field of dyslexia. Hence, one half of the expert panel comprised experts on the Jiva method of career counselling since a central element of this study is the MPT-5 which is based

on the Jiva approach. The criteria used for the empanelment of these individuals were that they were to have used the Jiva assessment tools for a minimum of 2 years or at least with 50 students. One of the experts has had a long standing career as a higher secondary school teacher. Another expert has more than 30 years of experience in the field of career guidance and is an international consultant in the field. The other half of the panel comprised professionals who were experts in the field of dyslexia. The criterion for their empanelment was a minimum of 20 years of experience in the field. The experts in dyslexia were all associated with institutions or centres that offer services ranging from assessment to intervention for children with dyslexia. Three of the experts worked in schools that cater to children with difficulties such as dyslexia. One of the experts is internationally recognised for her work in the area of dyslexia. The final expert panel for this study comprised five experts in the Jiva approach and six experts from the field of dyslexia.

The researcher first contacted the members of the panel to explain the purpose of the study and obtain their approval to become a member of the panel. The researcher then engaged with each panel member on a one-to-one basis as per the needs of the study.

3.7. Tools: The Multiple Potentials Test-5

3.7.1. Rationale for selection.

The Multiple Potentials Test–5 (MPT-5; Arulmani, 2005) is the standardised tool used in this study as the quantitative measure of aptitude. The MPT-5 is a part of the Jiva method of assessment. It was selected for this research, firstly, because the Jiva method on the whole has been developed to address career development in the Indian context and it is already embedded in the country's cultural realities. Since

dyslexia presents in a varied range of difficulties, a person-centred approach to assessment would be more suitable. The Jiva method follows an intra-personal rather than a norm-referenced approach. The researcher is trained in the Jiva method of career counselling and is a practitioner as well as a trainer in the Jiva method. Further, strong indication of its validity emerges from its successful adaptation to other countries.

3.7.2. A description of the MPT-5.

The MPT-5 is theoretically based on Arulmani and Nag-Arulmani's (2004) adaptation of the Theory of Multiple Intelligences (Gardner, 1983). The test assesses five areas of intelligence: Linguistic, Analytical-Logical, Spatial, Personal, and Physical-Mechanical. A brief description of each of these areas is provided in the Review of Literature. In summary, the MPT-5consists of 5 subtests with 30 items each, amounting to a total of 150 items. It is a timed test that allows 15 minutes for each subtest. The maximum possible score on each subtest is 30. Scores in the five subtests yield the aptitude profile of the test taker. The external criterion-related concurrent validity of the MPT-5 ranges between .64 to .71 and 12-month test-retest reliability ranges between .62 to .81 across the five subtests (Arulmani, 2014b). The test is available in English. Two sample questions from each of the sub tests are presented as illustrations in Appendix 1.

3.7.3. Alternate forms of the MPT-5.

Central to this study is the overarching objective of facilitating test performance such that the student with dyslexia is able to show his or her aptitudes in the best light. As per the design of this study, the use of accommodations in the administration of the MPT-5 was the method selected to facilitate test performance. As discussed in the Review of Literature, the effects of two accommodations were examined. One

accommodation is to extend the time allowed to complete the test and in this study has been named as the Extended Time Form. The second is the oral administration of the test and in this study has been named as the Oral Form.

3.7.3.1. *Construction of the alternate forms of the MPT-5.*

To create these alternate forms, the original test was divided into two equal parts, one for the Extended Time Form and second for the Oral Form. Each form has an equal number of items, namely 15 items per subtest amounting to a total of 75 items. The following points were kept in mind when choosing items for these two forms:

- As per the reported psychometric properties of the MPT-5, the difficulty levels of its items range between 40% and 60% (Arulmani, 2005). Based on this information, items were chosen so as to ensure that difficulty level of items was evenly spread in both forms of the MPT-5.
- When selecting items for the oral form, items that were not suited to oral presentation were not selected (e.g., items that required drawing).
- Items that had lesser number of words in the stem and in the response options were selected for oral presentation.
- After identifying the most suitable items for oral presentation, the remaining items were used for the extended time form.

3.7.3.2. *Trial testing of the alternate forms*.

The standardised form and the two alternate forms were administered to a small sample of five students with no known history of dyslexia, with a five-day gap between administrations. An examination of test results from each of the forms indicated no difference in scores across the three administrations.

3.8. Tools Constructed for the Purpose of this Study

3.8.1. Demographic Details Questionnaire.

This questionnaire was used to collect background information about the sample. It comprises a simple form requiring all participants to fill in the following details:

- Family background: Parents' names and occupational details
- Educational background: Number of years the child has studied in the present school as well as educational history
- Language fluency: Mother tongue of the child, languages known to the child, and the self-reported level of fluency in these languages (in speaking, reading, and writing).

3.8.2. Tests and Me Questionnaire.

This questionnaire was developed for the purpose of this study. The questionnaire comprises 20 items and is designed to assess the level of difficulty that a person experiences when taking a standardised, paper-pencil, psychometric test. The questionnaire measures difficulties that can be caused by either person characteristics or by test characteristics. Person characteristics refer to attributes of the test taker that can affect test performance while test characteristics refer to the characteristics of the test that could influence test performance.

3.8.2.1. *Construction of the Tests and Me Questionnaire.*

Based on a review of the literature, the researcher first created a list of person and test characteristics that could affect test performance. A total of 15 and 10 characteristics were initially listed for the person and test characteristics respectively. This list was presented to the Expert Panel along with the MPT-5. The experts in learning disabilities in the Expert Panel were asked to review the list keeping in view

the demands made by the MPT-5 and the limitations potentially posed by the features of dyslexia. Similarly, panel members who were experts in the Jiva method were asked to review the list keeping in mind factors in the MPT-5 that could contribute to a test taker's experience of ease or difficulty in taking the test. Items which had a 100% agreement amongst all members of the Expert Panel as contributing to the ease or difficulty of performing on theMPT-5 were selected to compose the final Tests and Me Questionnaire.

3.8.2.2. *Description of the Tests and Me Questionnaire.*

In its final form the Tests and Me Questionnaire is designed to examine seven person characteristics that can influence the level of difficulty experienced. They are (a) attention, (b) motivation, (c) memory, (d) anxiety, (e) reading accuracy, (f) reading comprehension, and (g) psychomotor control. The five test characteristics identified that can contribute to experience of difficulty are (a) complexity of language, (b) print of the test, (c) length of items, (d) strength of distractors, and (e) time given to answer the test. In addition to this, the questionnaire also assesses the person's preference for other formats of test (oral or pictorial), and the person's previous experience with other types of tests. Each item is anchored to six response options: *strongly agree, moderately agree, agree, disagree, moderately disagree,* and *strongly disagree*. Since the test aims to measure the level of difficulty experienced by an individual in taking a particular test, the questionnaire is administered immediately after the individual has taken a particular test. The total score of the test ranges from 20 to 120. A higher score reflects lower difficulty with taking the MPT-5 and a lower score indicates greater difficulty with taking the test. Appendix 2 presents the Tests and Me Questionnaire.

3.8.2.3. *Trial testing of the Tests and Me Questionnaire*.

The researcher trialled the selected items on four students she was seeing as part of her regular work. These trials pointed to minor changes in language and formatting. Based on this trial, a pilot version of the Tests and Me Questionnaire was created. This pilot version of the test was administered to a randomly selected sample of 42 students matched to the Study and Comparison Groups. Feedback pertaining to ease of comprehension was obtained and items were altered accordingly. The final version of the questionnaire was also shown to the Expert Panel. All members of the panel approved this version of the questionnaire.

3.8.3. Multiple Potentials Parent Questionnaire (MPPQ).

The MPPQ is based on the Multiple Potentials Framework and was developed as a tool with which to elicit information from the parents of the students with dyslexia to gain deeper insights into their strengths along the five potentials described by the Multiple Potentials Framework. This questionnaire collects information from parents about their child's hobbies and accomplishments in the five areas of the Multiple Potentials Framework.

3.8.3.1. Construction of the MPPQ.

This questionnaire was adapted from the Strengths and Accomplishments Questionnaire (SAQ) of the Jiva method of assessment (Arulmani, 2014a). The SAQ is designed to assess a student's aptitudes from his or her history of accomplishments and achievements. The questionnaire describes five progressively increasing levels of accomplishments for six activities for each of the five potential areas. The student is required to indicate the levels to which he or she has accomplishments for each of the activities**.** The activities and accomplishments described in the SAQ were adapted

and reformatted for administration to parents. This reformatted version of the SAQ comprised the Multiple Potentials Parent Questionnaire (MPPQ).

3.8.3.2. *Description of the MPPQ.*

The MPPQ is designed to elicit information from parents about their child's hobbies and accomplishments related to the five potential areas. For each potential area, the questionnaire describes the potential area and then gives examples of activities related to that potential area. Parents are required to fill out activities relevant to each area. Parents are instructed to consider the child's hobbies and accomplishments from childhood when they fill the questionnaire. They are also instructed to not restrict the activities that they fill in to the examples given in the questionnaire. The entries of the parents are examined to understand the strength of the child's orientations to the five areas of the Multiple Potentials Framework. Appendix 3 presents the MPPQ.

3.8.3.3. *Trial testing of the MPPQ*.

Administration of the final version of the MPPQ to two adults indicated that the questionnaire was yielding data needed for the purposes of this research. The questionnaire was also shown to three members of the Expert Panel. Minor adjustments were made in the instructions of the tool as per feedback received.

3.8.4. Learning Skills Profile (LSP) Tool.

This study attempts to identify links between the students learning skills profile and his or her suitability for a particular type of accommodation during assessment. Hence, the Learning Skills Profile (LSP) Tool is central to the objectives of this research. This tool was developed in order to understand how information about the nature and severity of the difficulties presented by the student with dyslexia can help

identify what kind of accommodation would improve his or her quality of performance and ease of test-taking.

The LSP Tool is based upon the on the International Classification of Functioning, Disability and Health-Children and Youth Version (ICF-CY) developed by the World Health Organization (WHO, 2002). The ICF-CY is a multipurpose classification system that takes a functions rather than a deficits approach to disability and health and provides a coherent framework to classify and measure levels of functioning and disability. It is divided into four main components: body structures, body functions, activity and participation, and contextual factors. Each of these components is arranged in a hierarchical order, divided into chapters and categories which are then divided into four domain levels. The researcher extracted information from this large and overarching framework to construct the Learning Skills Profile Tool.

3.8.4.1. Construction of the LSP Tool.

The starting point for this exercise was the complete ICF-CY with all its components. Guided by the definitions of dyslexia as specified by the DSM-V and ICD-11 Beta Draft and keeping in mind that the central aim of this exercise was to identify person characteristics that could affect the test-taking experience, the researcher identified areas in the ICF-CY that were completely irrelevant to the purpose of the study (e.g., structures related to the digestive, metabolic, and endocrine systems) and removed these areas from the list. In the selected chapters, the second, third, and fourth level domains were further examined and irrelevant domains were eliminated. To illustrate, in the chapter on mental functions, the second level heading, namely, sleep functions was removed while mental functions of language was retained. At the fourth level domain, reception of gestural language was removed but

reception of spoken language was retained. In this way the ICF-CY was used to create this first draft of the LSP Tool. As shown in Appendix 4 this first draft of the LSP Tool contained five chapters with selected second, third, and fourth level domains.

Once this draft was ready, the researcher met and interviewed the members of the Expert Panel. Each member was given a copy of the first draft of the tool along with a detailed cover note as shown in Figure 2.

Figure 2

Excerpt from Instructions to Panel of Experts in Constructions of the LSP Tool

> The purpose of this exercise is to develop a tool that will help to analyse an individual's strengths and weaknesses in learning that arise as a result of dyslexia. This profile will be referred to as a *learning skills profile*. Given below is a list of functions and activities that have been adapted from the International Classification of Functioning, Disability and Health (ICF) developed by the World Health Organization (WHO, 2002). Kindly go through the list and rate how closely each function/activity is linked to the *capacity of a child with dyslexia to take a standardised verbal test*.
>
> Your inputs would be used to develop a simple and easy-to-use instrument that could be integrated into the career counsellor's intake methodology. The career counsellor would use the Learning Skills Profile Tool to understand the strengths of the child with dyslexia and use this information to administer career guidance related instruments in a manner that would tap into the strengths rather than weaknesses of the child with dyslexia.

The researcher then had a discussion with the expert on each area in the draft tool. At the end of this discussion (during which the researcher made detailed notes of the discussion points), the expert was asked to use a rating scale (1: *Not related at all*, 2: *Mildly related*, 3: *Moderately related*, 4: *Closely related*) to rate each of the items in the draft LSP Tool for its relevance to understanding the capacity of a student with dyslexia to take a standardised, aptitude test.

After obtaining the ratings of all the members of the Expert Panel, the mean scores were calculated for each item. Any area obtaining an average score of 3 and above was included in the final version of the LSP Tool that was created. The final

areas that were selected for the LSP tool and its description according to the ICF-CY are given in Table 3.

Table 3
Areas of the ICF-CY selected for the LSP Tool

Area selected for Learning Skills Profile Tool	**Description according to ICF-CY**
Attention	Specific mental functions of focusing on an external stimulus or internal experience for the required period of time
Memory	Specific mental functions of registering and storing information and retrieving it as needed
Visual Perception	Mental functions involved in discriminating shape, size, colour and other ocular stimuli
Reception of spoken language (Oral Comprehension)	Mental functions of decoding spoken messages to obtain their meaning.
Reception of written language (Reading Comprehension)	Mental functions of decoding written messages to obtain their meaning.
Writing	Using or producing symbols or language to convey information, such as producing a written record of events or ideas or drafting a letter.

Source: World Health Organization, 2002

3.8.4.2. *Description of the LSP Tool.*

The final version of the LSP Tool comprises the following six areas: attention, memory, visual perception, reception of spoken language, reception of written language, and writing. Structured as it is on the ICF-CY format, the LSP Tool provides a framework for the systematic and structured elicitation of information. As per the ICF-CY, information for the tool can be collected from a wide range of sources such as standardised procedures and tests, assessment instruments, observations, interview with person or proxy, standardised or non-standardised questionnaires, or written materials provided by the person or proxy. The researcher's interest is to develop a tool that is simple enough to be used by a career guidance facilitator. Since they are usually well trained in the skills of interviewing, the

interview is taken as the primary method for collecting information for the LSP Tool. As per the ICF-CY, functioning is assessed in three dimensions: frequency, intensity, and effect. The ICF-CY also gives examples of questions that can be used to elicit information about functioning in these three dimensions. The questions for collecting information through the LSP Tool were adapted from these model questions given by the ICF-CY. Apart from interview with the client and the proxy, another data source that was added here was previous assessment reports of the client. Children with dyslexia often go through regular assessments during their education for purposes such as applying for concessions to education boards or planning of individualised education plans (IEP). The reports of such assessments were also identified as an important source of information for the LSP Tool. In this way, an LSP datasheet was created to record the information that was obtained from evaluation of assessment reports and from interviews with client and proxy. Appendix 5 presents the final LSP Tool along with the model interview questions.

After all available information is collected for the LSP Tool, this data is evaluated and a code is assigned for the three dimensions of each area as prescribed by the ICF-CY. Table 4 summarises the codes and its interpretation.

Table 4

Codes Used by the ICF-CY to Indicate Level of Difficulty

Code	Level of problem	Description of severity	Frequency
0	No problem	none, absent, negligible	0-4%
1	Mild	Slight, low	5-24%
2	Moderate	Medium, fair	25-49%
3	Severe	High, extreme	50-95%
4	Complete	Total	96-100%

3.8.4.3. *Trial testing of the LSP Tool: Case study of SMA.*

The researcher trial tested the final draft of the LSP Tool in a session at the special needs clinic where she works. The client for this session, SMA, was a 17-year-old girl studying in Grade 11. The session reported here is a follow up session conducted for SMA, after an earlier session conducted approximately two years earlier in which she was diagnosed with dyslexia, after a comprehensive round of assessment. This session was conducted by a senior psychologist with more than 25 years of experience in the area of assessment for learning disability. The purpose of this session was to " . . . understand SMA's growing skills and to help plan her learning support for the next few years" (as cited in the psychologist's report prepared after this session). During this session, testing was conducted to assess SMA's reading and writing skills as well as her general abilities.

At the end of the testing, the researcher used the LSP Tool to build a learning skills profile for this client. The data sources used here were the client's previous assessment report (obtained from the same centre) as well as interview with the client (the parent or any other proxy was not available for interview). The results obtained from the LSP Tool were compared with data obtained from standardised tests that were conducted by the psychologist with SMA. This revealed close proximity between the results of the LSP Tool and data from standardised tests where such information was available. These results have been reported in Table 5 given below.

Table 5

Comparison of Results from LSP Tool and Standardised Tests Administered on SMA

Area of LSP Tool	**LSP Code and Level of Problem**	**Information elicited from SMA through interview with the LSP Tool**	**Information from standardised test and parent reports**
Attention	LSP Code: 3 Level of problem: Severe	She often gets distracted or loses track when too much information is given to her at one time. English and Math classes are when this happens often.	Not assessed but a report from the parent states "attention span has remaining lower than expected"
Memory	LSP Code: 1 Level of problem: Mild	She is mostly able to do well if given sufficient time.	The test report states that she "retains the average performance on tasks requiring working memory."
Visual Perception	LSP Code: 3 Level of problem: Severe	SMA often made mistakes when reading especially when the text was very descriptive. Her mistakes usually resulted from not reading a word fully and mistaking it for a word that looks similar or skipping lines when reading.	As per test report, **"**The profile also confirms that a persistent difficulty with phonological decoding skills and mapping letter-to-sound remain."
Reception of spoken language	LSP Code: 3 Level of problem: Severe	As per her report, understanding what is said is difficult for her. At school, she often takes help from her friends to clarify instructions that the teacher gives her. Even in her friends groups, she is playfully made fun off for "missing the point" during conversations.	Not reported

Reception of written language	LSP Code: 3 Level of problem: Severe	She reported difficulties in understanding written text especially if the sentence structure is long or complex. She reported difficulties in understanding questions in the exam if worded differently from the way she learnt it.	Report states, **"**a plateauing off of skill development in the area of reading comprehension" Report states, "**attainment level**: Around 12 and 13 years" Report states, "did not spontaneously re-read the passage if something was not immediately clear" Report states, "continues to struggle with linking idea units mentioned across a passage or a collection of paragraphs"
Writing	LSP Code: 3 Level of problem: Severe	SMA reported that she finds it easier to express information through visuals rather than by writing. She says that she is often not able to find the right words to convey her ideas.	Report states "shows significant slippage in spelling skills during writing of essays and other forms of narratives" Report states, "used a basic vocabulary, with few adjectives and adverbs" Report states, "SMA remains below her age and grade level for the higher-order processes of planning and writing for an audience."

The above results indicate that data obtained through the LSP Tool could tie closely with data obtained through standardised tests. For the purposes of this study, this case study was taken as initial evidence of the validity and usefulness of the LSP Tool in building a learning skills profile of a student.

3.9. Implementation of the Study

3.9.1. Ethics clearance and informed consent.

The overall ethical guidelines followed throughout the course of this research are presented in Appendix 6. The synopsis of the research was presented to the Ethics Committee of the Martin Luther Christian University and ethics clearance was obtained as presented in Appendix 7. For the Comparison group, a written informed consent form was prepared by the researcher, as presented in Appendix 8. The form was read out to the sample and they were given the opportunity to ask for clarifications. They were also given the option of not participating in the study if they so desired. All students agreed to participate. They were then requested to sign at the bottom of the form to indicate their willingness to participate in the study. For the Study Group, written permission to conduct the study was obtained from the school from which the sample of students with dyslexia was composed, as presented in Appendix 9. In one case where the student was approached directly and not through the school, informed consent was obtained from the parents, as presented in Appendix 10. Since reading comprehension is a difficulty for these students, the details of the study were orally explained to all members of the Study Group and they were given the option of asking for clarifications and for not participating in the study. All students agreed to participate. With a view to ensuring that the participants benefitted

from the exercise, a full careers programme was offered to all students who participated in the study.

3.9.2. Recruitment of the sample.

The sample for this research comprised a Comparison Group: students with no known history of dyslexia or other learning difficulties) and a Study Group: students with a reliable diagnosis of dyslexia. The original intention of the researcher was to compose the sample for the Comparison Group using the principles of randomisation. Hence, a list of all schools that would qualify in Bangalore (the original location of the study) was made. However, on approaching these schools, it was noted that a large number were unwilling to participate in the study. The non-availability of students due to time pressures was the main reason given. Therefore, the researcher had to resort to convenience sampling. Schools were selected mainly as per school authorities' willingness to participate in the study and ensuring sufficient fluency in English. It is highlighted here that the access to the sample varied by geographical locations and willingness of schools to allot the required time. Hence, various cohorts emerged within the Comparison Group of this sample. Details about which tests were administered to which cohorts is described in the chapter on Results and Findings. The Study Group was recruited through purposive sampling since the members of this group were required to meet certain specific criteria such as a reliable diagnosis of dyslexia. The Comparison Group was matched to the Study Group on all factors except the presence of dyslexia. The purpose of having a Comparison Group was to establish a baseline against which the performance of the Study Group could be compared. Hence, the Comparison Group was much larger (N = 1,200 individuals in 13 cohorts, drawn from 4 different locations) than the Study Group (N = 6, drawn from 2 schools in Bangalore). Further details are provided in the next chapter.

3.9.3. Administration of standardised aptitude test to the Comparison Group and the Study Group.

The first objective was to obtain baseline data pertaining to the performance of the Comparison Group (students without dyslexia) and the Study Group (students with dyslexia) on a standardised administration of the MPT-5. Hence, on completion of tool construction and sample recruitment, the MPT-5, was administered to all the cohorts in the Comparison Group and the Study Group as per the stipulated standardised administration. All standardised instructions for test administration were followed. The test was group administered, in the classroom setting. Students were allowed 15 minutes per subtest after which they were required to stop writing. The five subtests were administered consecutively over a total period of 75 minutes, with no breaks in between. Pauses during test-taking for detailed clarifications of items were not allowed. Hence, in the first administration of the MPT-5, the students with dyslexia went through the test with no accommodations or concessions.

3.9.4. Collection of data on the level of difficulty in test-taking experienced by the Comparison Group and the Study Group.

The second objective was to collect information on the person's experience of difficulty in taking the MPT-5. Hence, the Tests and Me Questionnaire, which was prepared for this purpose, was administered to the Comparison Group and the Study Group immediately after they completed the MPT-5 exercise. The researcher first explained the objectives of the questionnaire to the students and they were specifically instructed to answer the Tests and Me Questionnaire keeping their experience with the MPT-5 in mind. The researcher then explained the rating scale to the students. The researcher read out the first question and elicited the students' responses to ensure that

they had understood the rating scale clearly. The students were asked to clarify any doubts with the researcher.

3.9.5. Collection of information pertaining to the Learning Skills Profile.

The central objective of this study is to create a system of assessment that allows for accommodations such that the features of dyslexia do not obstruct the student's test performance. As per the design of this study, the unique profile of learning skills of each student in the Study Group was expected to throw further light on which accommodation suited which student better. Hence, the next step in the study was to focus on the Study Group to collect information on their learning skills profile. The Learning Skills Profile Tool, developed for this purpose, was now administered to each member of the Study Group and a learning skills profile was developed for each person. The data for the LSP Tool was collected from the client and proxy (parent and/or teacher) and by examining previous assessment reports of the students. The number of sessions taken to collect this information ranged from 3 to 4 sessions of approximately 15 hours per session. In the first session, the researcher worked with the high school coordinator of the school to which students of the Study Group belonged and examined all available assessment reports of each student along with her. Data was collected for every student for all areas of the LSP and recorded on the LSP datasheet. In the next round, each student was met and interviewed using the LSP Tool. The final source of information was an interview with the parent/s. A shortcoming of any reported data is reporter bias and the researcher was aware of this during the interviews. This was minimised by using sufficient probes to get a clear and detailed description of each area and by validating this against data collected from assessment reports and from tests. The data was later

evaluated to build learning skill profiles for all the students in the Study Group. This is reported in the following chapter on Results and Findings.

3.9.6. Administration of the alternate test forms of the MPT-5 to the Study Group.

The objective now was to collect information to examine the outcomes of re-administering the MPT-5 using two specific accommodations, namely the Extended Time Form and the Oral Form. Both forms were administered to all students in the Study Group. The students were administered the Extended Time Form and the Oral Form with a gap of one week in between the two assessments. All students were administered the Extended Time Form first and then the Oral Form.

3.9.6.1. *Administration of the Extended Time Form.*

The Extended Time Form of the MPT-5 consisted of 75 questions (15 questions each for five areas). This form was administered to all students of the Study Group (except Student SAS who belonged to a different school) in a group format. All standardised instructions for the test were followed except the time restriction. In the standardised full form of the test, the student is given 15 minutes to answer each area, which is a total of 75 minutes. In the Extend Time Form, students were instructed that there was no time limit but that they should try to answer as fast as possible. Detailed clarification of the meaning of items was not allowed. Students were allowed to complete all 75 items and the time taken by each student was recorded.

Immediately on completion of the Extended Time Form, all students were administered the Tests and Me Questionnaire. This was with the intention of collecting information on the extent of difficulty they experienced with the Extended Time Form of the MPT-5. They were reminded about how to answer the questionnaire and the specific instruction given was to complete the questionnaire

keeping in view their experience of taking the Extended Time Form of the test that they just completed.

3.9.6.2. *Administration of the Oral Form.*

The Oral Form of the MPT-5 consisted of 75 questions (15 questions each for five areas). The Oral Form of the test was administered to the members of the Study Group in an individual format for the following reasons:

- avoid auditory disturbances that may come up in group formats.
- provide the opportunity to repeat questions to the student when necessary.

All other standardised instructions for the test were followed. Since the standardised test allows 30 seconds to answer each question (15 minutes for 30 questions), in this form the student was allowed 30 seconds for each question. The student was presented with the next question immediately after the 30 seconds were over. These 30 seconds included the time taken by the researcher to read the question, to repeat it in case the student asked for the same, and for the student to write the answer. Once more, at the end of the Oral Form, students were administered the Tests and Me Questionnaire.

The data obtained was used to compare performances on the full form of the test and the accommodated versions. This analysis is reported in the following chapter on Results and Findings. With the administration of the alternate forms of the MPT-5, the data collection phase of the study came to an end.

3.10. Use of Triangulation to Validate Findings

Triangulation refers to ". . . using multiple data sources in an investigation to produce understanding" (Cohen & Crabtree, 2006). Triangulation is also used in research to establish validity by analysing a research question from multiple

perspectives (Guion, Diehl, & McDonald, 2011). Triangulation can be done in five different ways (Guion et al, 2011):

- Data triangulation: Use of multiple sources of information to increase the validity of the data
- Investigator triangulation: Use of different investigators in the analysis process to develop a broader understanding from the perspectives of different investigators
- Theory triangulation: Use of different perspectives to interpret the same data
- Methodological triangulation: Use of multiple quantitative, qualitative methods to study the program
- Environmental triangulation: Use of different locations, settings, and other factors related to the environment

Data triangulation and methodological triangulation were used to validate the findings of this study. Given below is a description of how these methods were used.

1. Data triangulation: Three sources of data were used to build the learning skills profile of the six students in this study - information gathered from assessment reports, interview with the child, and interview with the parent. Data obtained from each source were checked against each other and consolidated to build information on each domain of the learning skills profile as well as to validate information from the other sources.
2. Methodological triangulation: Multiple methods were used to validate the identification of the most suitable form of accommodation based on the learning skills profile. One method was to assess the performance of the students on the accommodated forms of the multiple potentials test for better performance. The second method was to re-administer the Tests and Me Questionnaire to the

students after they took the accommodated forms, to assess the change in difficulty experienced.

Further details on how the validity of the findings of this research was examined through data and methodological triangulation are provided in the Results and Findings chapter.

3.11. Approach to Data Analysis

This study collected quantitative data through the use of the tests described in this chapter. The study also collected qualitative information through interviews with students and parents of the Study Group in order to present a case study of each student in this group. This section describes the approach to data analysis, both quantitative and qualitative.

3.11.1. Analysis of quantitative data.

The quantitative data was analysed in three parts.

The objective of the first part of the analysis is to profile the actual problem. In other words, the objective here is to understand how the performance of the Study Group on the standardised assessment tool (MPT-5) is different from that of the Comparison Group. The performance of the Study Group was evaluated using two variables: (a) the quality of the student's test performance as indicated by a change in scores obtained on the MPT-5, and (b) the level of difficulty reported by the student when taking the MPT-5 as shown on the student's score on the Tests and Me Questionnaire. The first variable, the quality of the student's test performance on the MPT-5, is to understand how the Study Group and the Comparison group varied in their ability to perform on the MPT-5. The second variable, the level of difficulty reported by the student when taking the MPT-5, is to understand how the Study

Group and the Comparison group varied in their subjective experience of difficulty in taking the MPT-5.

The analytic approaches used to obtain this information were as follows. Firstly, the performance of the Comparison Group was used to develop normative tables for the MPT-5 and the Tests and Me Questionnaire. The norms were developed by calculating quartiles and plotting the performance of the Comparison Group into four quarters: *very low*, *low*, *high*, and *very high*. The performance of each student in the Study Group was then evaluated against these norms.

Secondly, the *z* score was computed. The *z* score provides a quantitative indication of the number of standard deviations a score is from the mean. In this study, *z* scores were developed for each student in the Study Group for both the MPT-5 and the Tests and Me Questionnaire in order to understand the difference between the performances of the students in the Study Group and the Comparison Group.

The objective of the second part of the quantitative analysis is to trial test two alternate forms of the standardised MPT-5 on the Study Group. The Extended Time Form and the Oral Form were used in this study since these are two commonly offered to students with dyslexia, during educational assessments. In this study, the Extended Time Form offers a time relaxation while the Oral Form offers an oral administration of the test. The objective of the analysis here is to evaluate how the students in the Study Group perform with these accommodations in comparison to the standardised version of the test. For this analysis, the same two variables are used to assess the students' performance on the alternate forms of the test: (a) the quality of the student's test performance as indicated by a change in scores obtained on the two alternate forms, and (b) the level of difficulty reported by the student when taking the two alternate forms.

The third part of the analysis aims to understand the performance of students in the Study Group on the alternate forms of the test in the light of the information gathered from their learning skills profile. The areas of difficulty on the learning skills profile and the severity of the difficulty in each area was examined to understand its impact on the students' performance in the alternate forms of the test.

3.11.2. Analysis of qualitative data.

Given the individual specific manifestations of the features of dyslexia, qualitative analysis of the six students in the Study Group was also undertaken. The case study method has been used to provide detailed information about each student in the Study Group. As discussed earlier, case study designs use multiple data sources to build in depth contextual information about the cases in order to study a particular issue.

The six students in the Study Group are presented as cases with detailed information about their early childhood, family history, schooling history, language fluency, profile of strengths and weakness, experience of examinations, learning skills profile, and diagnosis of dyslexia. All case studies are presented in the following chapter on Results and Findings.

3.12. Follow Up and Conclusion of the Study.

As part of the ethical considerations of this study, career guidance was offered all the students who participated in the study (both the Study Group and the Comparison Group). For the Comparison Group, one-day career guidance workshops were completed in Cohorts 1 to 6. The programme could not be offered in Cohort 7 due to unavailability of dates from the school to conduct the programme. However, students were given contact details of the researcher and were instructed that they

could contact her individually for any career guidance support. In the Study Group, two students and their families took up expresses interest and participated in a career guidance session. This was a five-hour session with each student and his/her family. One student was not interested to take up the session as she had already attended a career guidance session at another centre. The families of two other students chose not to attend the career guidance session. One student was contacted the two times with the offer but was inaccessible thereafter since he had left the school.

3.13. Conclusion

This chapter presented the rationale underlying the methodology followed for this research. The details of tools used and steps followed for the construction of new tools have been described. Finally, the steps followed for the implementation of the study have been presented. The limitations experienced and necessity for changing some aspects of the design particularly with regard to sampling have also been described. The findings from the analysis of the data collected following the methods outlined in this chapter are presented in the following chapter on Results and Findings.

Chapter 4

Results and Findings

This study rests on the observation that although students with dyslexia do have aptitudes and talents similar to their non-dyslexic peers, they are likely to underperform on standardised psychometric assessments, since the features of dyslexia interfere with their performance. Central to the purpose of this research is the development of an assessment system whereby students with dyslexia could show their talents in the best light. Hence, the sample for this study comprised two groups, namely, the Study Group (students with dyslexia) and the Comparison Group (students without dyslexia). The first objective of this study was to compare the performance of the Study Group with the performance of the Comparison Group on the Multiple Potentials Test–5 (MPT-5) (Arulmani, 2005), a psychometric, aptitude test to understand the difference, if any, between these two groups on the quality of their performance. The next objective was to understand the level of difficulty experienced in taking the test. The study then aimed at examining how test performance could be improved by introducing two specific accommodations. Finally, the change in the quality of performance as linked to students' learning skills profile was measured. The steps taken to meet these objectives are summarised below.

The Comparison Group and the Study Group were administered the standardised version of the Multiple Potentials Test-5 (MPT-5) which assesses aptitudes using the Multiple Potentials Framework (described in the Methodology chapter). The test consists of five subtests with 30 questions each. It is a timed test that allows 15 minutes for each subtest. The maximum score on each subtest is 30. Immediately after taking the standardised administration of this aptitude test, the

students in both the groups were administered the Tests and Me Questionnaire which was constructed for the purpose of this study. The Tests and Me Questionnaire consists of 20 questions which assess the difficulty experienced by the student in taking a test. Test scores range from 20 to 120. A higher score indicates lower difficulty with taking the test while a lower score indicates greater difficulty with taking the test.

In order to examine the performance of students with dyslexia on the standardised aptitude test with suitable accommodations, the Study Group was administered two alternate forms of the MPT-5 and the Tests and Me Questionnaire subsequent to the administration of each alternate form.

Finally, data was collected from multiple sources to build a learning skills profile for each student in the Study Group. The performance of the students on the two alternate forms of the standardised aptitude test was examined in the light of this learning skills profile.

A mixed methods approach was taken for the data analysis, combining both quantitative and qualitative methods. Since the data obtained are both qualitative and quantitative in nature and given the individual variations in the manifestation of dyslexia amongst the students in the Study Group, data and methodological triangulation (Guion et al., 2011) were used to validate findings.

The results and findings of this research are presented in this chapter in two broad sections. In its first part (sections 4.1 to 4.3), this chapter reports the findings viewing the sample as a whole. Quantitative comparisons are made between the Comparison and Study Groups. Quantitative data is also used to make within group comparisons of the Study Group. Once again, keeping the individual variations that are seen in the manifestation of the features of dyslexia, the latter part of this analysis

takes a case study approach (Sections 4.4 to 4.11). Information was collected through qualitative techniques such as interviews and examination of assessment reports. The second section of this chapter draws this information together to present case study reports about each member of the Study Group, covering details such as early childhood history, family background, schooling history, language fluency, profile of strengths and weaknesses, diagnosis, subjective experience of examinations, and the individualised learning skills profile.

4.1. Characteristics of the Sample

The sample comprises two groups: the Comparison Group and the Study Group. The Comparison Group comprised students with no known diagnosis of dyslexia. The function of this group was to serve as a standard against which the performance of the Study Group could be compared.

The Comparison Group consisted of a total of 1,200 individuals, in 13 cohorts, from middle to upper-middle SES backgrounds drawn from four different parts of the country. While the researcher initially intended to use the randomised sampling method for recruiting this sample, a large proportion of the schools in Bangalore (where the researcher is located) that were approached were unwilling to participate in the study. The main reason given was the time constraints faced by the students. Hence, the researcher had to resort to convenience sampling. Schools with students showing the required level of English fluency that were willing to participate in the study were included in the sample. However, the selected schools varied in their geographical location and willingness to allot the required time. However, an advantage that emerged was that a much wider sample could be gathered across four different geographical locations and three different boards of education. Hence,

multiple cohorts emerged within the Comparison Group of this sample. Members of the Comparison Group were studying in Grades 9, 10 and 11, with a mean age of 15.05 years, with close to equal numbers representing boys and girls. This group had no known diagnosis of dyslexia. All schools that comprise the Comparison Group were co-educational, under three different boards of education, and under private management.

The Study Group comprised six students, three boys and three girls, with a diagnosis of dyslexia, from middle and upper-middle SES backgrounds, studying in Grade 10, under two different boards of education in Bangalore. Five of these students were from the same school, following the same board of education, while one was from a school following an international education board. The Comparison and Study Groups were matched on all criteria excepting the presence of dyslexia. Table 6 highlights the key characteristics of the sample.

Table 6

Characteristics of the sample

Cohort/ Student	Location	Age range in years (Mean, SD)	Grade	Socio Economic Status (SES)	School Board	Number in each gender		
						Boys	Girls	Total
COMPARISON GROUP								
Cohort 1a	Bangalore, Karnataka	14-16 (14.88, .36)	10	Middle to Upper Middle	CBSE	75	86	161
Cohort 1b	Bangalore, Karnataka	14-16 (14.96, .26)	10	Middle to Upper Middle	CBSE	108	114	222
Cohort 2a	Bangalore, Karnataka	14-16 (14.92,.38)	10	Middle to Upper Middle	CICSE	47	34	81
Cohort 2b	Bangalore, Karnataka	14-16 (14.99, .19)	10	Middle to Upper Middle	CICSE	46	39	85
Cohort 3a	Bangalore, Karnataka	14-16 (14.94, .35)	10	Middle	State	11	23	34
Cohort 3b	Bangalore, Karnataka	14-16 (14.93, .34)	10	Middle	State	20	21	41
Cohort 4a	Bangalore, Karnataka	14-16 (14.98, .33)	10	Middle	State	20	44	64
Cohort 4b	Bangalore, Karnataka	14-16 (14.90, .36)	10	Middle	State	26	25	51
Cohort 5a	Hosur, Tamil Nadu	14-16 (14.70, .62)	10	Middle	CBSE	17	21	38
Cohort 5b	Hosur, Tamil Nadu	14-15 (14.82, .39)	10	Middle	CBSE	15	18	33
Cohort 5	Bongaigaon, Assam	15-17(16.11, .56)	11	Middle to Upper Middle	CBSE	59	43	102

Cohort 6	Bongaigaon, Assam	15-18 (16.20, .63)	11	Lower Middle to Middle	State	83	89	172
Cohort 7	Kannur, Kerala	13-15 (14.35, .39)	9	Middle to Upper Middle	CBSE	65	51	116
TOTAL						592	608	1200
STUDY GROUP								
Student BR	Bangalore, Karnataka	15	10	Middle	NIOS	1	0	1
Student SS	Bangalore, Karnataka	14	10	Middle	NIOS	0	1	1
Student JS	Bangalore, Karnataka	16	10	Middle	NIOS	1	0	1
Student RR	Bangalore, Karnataka	15	10	Upper Middle	NIOS	0	1	1
Student SAS	Bangalore, Karnataka	14	10	Upper Middle	IGCSE	0	1	1
Student AJS	Bangalore, Karnataka	16	10	Middle	NIOS	1	0	1
TOTAL						3	3	6

Note:

1. Suffixes a and b have been used to denote sub-cohorts of students in Grade 10 over two academic years: Suffix a denotes students in Grade 10 during academic year 2014-2015 and suffix b denotes students in Grade10 during 2015-2016.
2. CBSE = Central Board of Secondary Education; CICSE = Council for Indian Certificate of Secondary Education; State = State Board of Education; NIOS: National Institute of Open Schooling; IGCSE = International General Certificate of Secondary Education

The Jiva method of career counselling used in this study has been institutionalised in these schools. The entire Comparison Group (N = 1,200) underwent the standardised administration of the MPT-5. However, given the limitations of access to the sample, only Cohort 7 (n = 109) was administered the Tests and Me Questionnaire. The data was analysed in three parts.

4.2. Performance of Comparison Group and Study Group on the Standardised Administration of the Aptitude Test

The purpose of this analysis is to understand how the Study Group differs from the Comparison Group in their performance on a *standardised* (no accommodations provided) administration of the Multiple Potentials Test–5 (MPT-5) aptitude test. The performance of the Study Group was evaluated using two variables: (a) the quality of the student's test performance as indicated by scores obtained on the MPT-5, and (b) the level of difficulty reported by the student when taking the MPT-5.

4.2.1. Difference between the Comparison Group and Study Group on the quality of test performance on the standardised administration of the MPT-5 aptitude test.

This analysis examined how the Study Group and the Comparison Group varied in the quality of their performance on a standardised administration of the MPT-5. The MPT-5 was administered to both groups following the standardised rules of administration. Table 7 shows the mean scores obtained by the Comparison Group and the Study Group on the five subtests of the MPT-5.

Table 7

Mean scores (SD) Obtained by the Comparison Group and Study Group on the Standardised Administration of the MPT-5

	L	**AL**	**S**	**P**	**PM**
Comparison Group	58.43 (16.14)	59.70 (19.31)	53.71 (13.92)	52.18 (11.50)	50.24 (14.05)
Student BR	27	33	33	30	47
Student SS	13	7	27	13	37
Student JS	30	27	43	43	40
Student RR	7	23	40	47	40
Student SAS	53	70	50	50	57
Student AJS	37	27	30	47	27

Note:
1. All test scores are in percentages.
2. L = Linguistic, AL = Analytical-Logical, S = Spatial, P = Personal, PM = Physical-Mechanical

In order to compare the performances of the two groups, two derived scores, quartiles and *z* scores, were examined.

Quartiles. Quartiles divide a sample into four equal groups on the basis of the distribution of the values of a specific variable. As described by Garrett (1967), quartiles are three points on a number line that divide a data set into four equal clusters, each cluster making up a quarter of the data. The first quartile (Q1) is the middle number between the smallest number and the median of the data set. The second quartile (Q2) is the median of the data. The third quartile (Q3) is the middle value between the median and the highest value of the data set. Dividing a sample's scores on a test into quartiles provides a normative table against which an individual's performance on that test can be compared with the group's performance. In this study, the performance of the Comparison Group (N = 1,200) on the five subtests of the MPT-5 were divided into quartiles, with a view to comparing the performance of

the Study Group individuals with the Comparison Group. The distribution of the Comparison Group's scores as captured by the inter-quartile range was used to compare the performance of the members of the Study Group against the Comparison Group as shown in Table 8. To illustrate, as shown in Table 8, Student AJS obtains a mean score of 47% on the Personal subtest while Student SS obtains a score of 13%. Drawing upon the inter-quartile range, Student AJS's score would be interpreted as *low* (Quartile 2*)*, while Student SS's score would be interpreted as *very low* (Quartile 1). Table 8 reports the quartiles derived for each subtest derived from the performance of the Comparison Group on the MPT-5 and interprets the performance of the Study Group against the inter-quartile range.

Table 8

Comparison of the % Scores Obtained by the Study Group on the Standardised Administration of the MPT-5 against the Inter-Quartile Range Derived from Scores of the Comparison Group

Quartile and interpretation	**L** Mean % Score Obtained by Comparison Group = 58.43	**AL** Mean % Score Obtained by Comparison Group = 59.70	**S** Mean % Score Obtained by Comparison Group =53.71	**P** Mean % Score Obtained by Comparison Group =52.18	**PM** Mean % Score Obtained by Comparison Group =50.24
	Inter-Quartile Range for the Standardised Administration of the MPT-5				
Quartile 1 (very low)	0 – 47	0 – 47	0 – 43	0 – 43	0 – 40
Quartile 2(low)	48 – 60	48 – 60	44 – 53	44 – 53	41 – 50
Quartile 3(high)	61 – 70	61 – 76	54 – 63	54 – 60	51 – 60
Quartile 4(very high)	71 – 100	77 – 100	64 – 100	61 – 100	61 – 100
	Score obtained in percentages (interpretation)				
Student BR	27 (VL)	33 (VL)	33 (VL)	30 (VL)	47 (L)
Student SS	13 (VL)	7 (VL)	27 (VL)	13 (VL)	37 (VL)
Student JS	30 (VL)	27 (VL)	43 (VL)	43 (VL)	40 (VL)
Student RR	7 (VL)	23 (VL)	40 (VL)	47 (L)	40 (VL)
Student SAS	53 (L)	70 (H)	50 (L)	50 (L)	57 (H)
Student AJS	37 (VL)	27 (VL)	30 (VL)	47 (L)	27 (VL)

Note:

1. L = Linguistic, AL= Analytical-Logical, S = Spatial, P = Personal, PM = Physical-Mechanical

2. VL = very low; L = low; H = high, VH = very high

In all cases (except in the case of Student SAS) when compared with the Comparison Group, it is seen that the Study Group has obtained lower scores. For two students (Students JS and RR), performance in all five subtests falls into the *very low* category when compared with the Comparison Group. For three students (Student AJS, BR, and RR), scores in four subtests fall in the *very low* category and score in one subtest falls into the *low* category. For one student (Student SAS), scores in three subtests fall into the *low* category, while scores in two subtests fall into the *high* category. While the pattern of lower performance by the Study Group persists across all members of this sample, no one subtest emerged as difficult for all students.

Summary of findings. In summary, the trends in the pattern of results are clear. Seventy five percent of the students in the Comparison Group performed above the Study Group on 22 of the 30 test results reported (the five tests taken by each of the six students with dyslexia = thirty test results). Of the remaining, six test results have 50% of students in the Comparison Group above the performance of the Study Group. Only on two test results is the performance of the Study Group *high* with just 25% of students in the Comparison Group ahead in performance.

z scores. The performance of the Study Group and Comparison Group were further compared through the use of *z* scores. The *z* score converts a score into the number of standard deviations it is away from the mean. Table 9 reports the performance of the Study Group as *z* scores.

Table 9

Comparison of performance of Study Group against Comparison Group on the standardised administration of the Aptitude Test using z scores

	L Mean % Score Obtained by Comparison Group = 58.43	**AL** Mean % Score Obtained by Comparison Group = 59.70	**S** Mean % Score Obtained by Comparison Group =53.71	**P** Mean % Score Obtained by Comparison Group =52.18	**PM** Mean % Score Obtained by Comparison Group =50.24
z scores					
Student BR	-2	-1	-1	-2	0
Student SS	-3	-3	-2	-3	-1
Student JS	-2	-2	-1	-1	-1
Student RR	-3	-2	-1	0	-1
Student SAS	0	1	0	0	0
Student AJS	-1	-2	-2	0	-2

Note: L = Linguistic, AL= Analytical-Logical, S = Spatial, P = Personal, PM = Physical-Mechanical

As seen in Table 9, in all cases (except in the case of Student SAS) it is seen that the *z* scores of the Study Group fall below the mean scores of the Comparison Group.

Summary of findings. Examination of the data, both through quartile distributions as well as *z* scores, shows clear trends: Students with dyslexia perform well below the performance of students without dyslexia on a standardised administration of the MPT-5. Across the students, we see the following: On four test results, performance is three standard deviations below the mean, nine tests results are each two and one standard deviation below the mean. Only seven test results are at the mean, and just one is one standard deviation above the mean.

4.2.2. Difference between the Comparison Group and Study Group on the level of difficulty reported by the students when taking the standardised administration of the aptitude test.

In addition to assessing the students' performance resulting from a standardised administration of the MPT-5, the Tests and Me Questionnaire was administered to assess the student's subjective experience of taking the standardised aptitude test. Table 10 presents the performance of the Study Group and the Comparison Group on the Tests and Me Questionnaire.

Table 10

Scores obtained by the Study Group and the Mean Score obtained by the Comparison Group on the Tests and Me Questionnaire

Group	Score
Comparison Group (n=109)	83.62 (13.23)
Student BR	64
Student SS	56
Student JS	84
Student RR	95
Student SAS	106
Student AJS	62

Note:
1. Scores range from minimum 20 to maximum 120.
2. Higher score indicates lower difficulty.

As with the standardised aptitude test, the performance of the Study Group and the Comparison group were compared against each other using quartiles and *z* scores.

Quartiles. The inter-quartile range for the Tests and Me Questionnaire was derived from the performance of the Comparison Group. The scores of the Study Group were compared against the inter-quartile range derived from the performance

of the Comparison Group on the Tests and Me Questionnaire. This is reported in Table 11.

Table 11

Comparison of Scores Obtained by Study Group on the Tests and Me Questionnaire Against the Inter-Quartile Range Derived from the Scores of the Comparison Group

Quartile	**Mean Score (SD) obtained by Comparison Group 83.62 (13.23)**	**Interpretation**
	Inter-quartile range for the Tests and Me Questionnaire	
Quartile 1	0 – 75	Very High Difficulty
Quartile 2	76 – 83	High Difficulty
Quartile 3	84 – 92	Low Difficulty
Quartile 4	93 – 120	Very Low Difficulty
	Score Obtained	**Interpretation**
Student BR	64	Very High Difficulty
Student SS	56	Very High Difficulty
Student JS	84	Low Difficulty
Student RR	95	Very Low Difficulty
Student SAS	106	Very Low Difficulty
Student AJS	62	Very High Difficulty

Notes:
1. Scores range from minimum 20 to maximum 120.
2. Higher score indicates lower difficulty.

Scores of students in the Study Group indicate that three students reported *very high difficulty* with the standardised aptitude test, one student indicated *low difficulty,* and two students indicated *very low difficulty*.

z scores. The performance of the Study Group and Comparison Group on the Tests and Me Questionnaire were further compared through the use of *z* scores.

Table 12

Comparison of Study Group Against Comparison Group on the Tests and Me Questionnaire Using z scores

z scores	
Student BR	-1
Student SS	-2
Student JS	0
Student RR	1
Student SAS	2
Student AJS	-2

As indicated by Table 12, two students obtained scores that placed them two standard deviations below the mean, one student obtained a score one standard deviation below the mean, one student obtained a score that placed him at the mean, one student obtained a score that placed her one standard deviation above the mean and one student obtained a score that placed her two standard deviations above the mean.

Summary of findings. The Comparison Group obtained a mean score of 83.62 indicating low level of difficulty. Three out of six students in the Study Group reported *low* or *very low* difficulty with the MPT-5 while the remaining three students reported *high* or *very high* difficulty. The range of difficulty expressed varied from two standard deviations below the mean to two standard deviations above the mean.

4.3. Performance of the Study Group on the Two Alternate Forms of the MPT-5.

It is to be noted here that the full form of the MPT-5 (30 items per sub test) was adapted to create equivalent forms of the MPT-5 to serve as the alternate forms for the rest of the study. The first form offered the student extended time to complete the test (Extended Time Form) while the second form was an orally administered form of the

test (Oral Form). The two forms were created by splitting the standardised MPT-5 into half and selecting 15 questions from each subtest that were suitable for oral administration into the Oral Form. The remaining 15 questions from each subtest constituted the Extended Time Form. Equal distribution of difficulty level was also ensured when identifying items for the two forms.

The performance of the Study Group on the two alternate forms of the standardised aptitude test (MPT-5) was examined. Table 13 presents the performance of the Study Group on the full form of the MPT-5 administered with no accommodations as well as the two alternate forms of the MPT-5.

Table 13

Performance of the Study Group on the Standardised Aptitude Test and the Extended Time and Oral Forms of the MPT-5

	L			**AL**			**S**			**P**			**PM**		
	S	**T**	**O**	**S**	**T**	**O**	**S**	**T**	**O**	**S**	**T**	**O**	**S**	**T**	**O**
Student BR	27	33	40	33	47	40	33	67	60	30	40	33	47	60	40
Student SS	13	13	67	7	33	40	27	67	40	13	33	47	37	33	40
Student JS	30	40	60	27	33	40	43	40	33	43	40	47	40	40	53
Student RR	7	53	20	23	73	33	40	67	33	47	60	40	40	53	20
Student SAS	53	67	27	70	60	13	50	80	7	50	60	47	57	53	13
Student AJS	37	13	7	27	47	27	30	27	7	47	33	13	27	13	27

Note:

1. All scores are in percentages.
2. L = Linguistic, AL= Analytical-Logical, S = Spatial, P = Personal, PM = Physical-Mechanical
3. S=Standardised Aptitude Test, T= Extended Time Form, O=Oral Form

Table 13 shows variable effects emerging from the Extended Time and Oral Forms across individuals in the Study Group and across the subtests of the MPT-5. These variations are further discussed in the sections that follow.

One of the aims of the study is to examine the relative effects of the alternate forms on test performance. In the next section, the students' performance in each alternate form of the test is compared to their performance on the standardised aptitude test.

4.3.1. Performance of the Study Group on the Extended Time Form.

A three-step analysis was used to examine the performance of the students on the Extended Time Form: (a) comparison with their own performance on the standardised administration of the aptitude test, (b) comparison with that of the Comparison group, and (c) comparison using the Tests and Me Questionnaire for the Extended Time Form and the standardised aptitude test.

4.3.1.1. Within Group Comparison the Study Group's performance on the Extended Time Form of the MPT-5.

One of the questions being investigated by this study is the possibility that the Extended Time Form would have a differential impact on test performance across members of the Study Group. The results of this analysis are presented in Table 14 which compares the performance of the Study Group on the Extended Time Form with its performance on the standardised administration f the MPT-5.

Table 14

Within Group Comparison of the Study Group's Performance on the Extended Time Form of the MPT-5

	L		AL		S		P		PM	
	S	**T**	**S**	**T**	**S**	**T**	**S**	**T**	**S**	**T**
Student BR	27	33	33	47	33	67	30	40	47	60
Student SS	13	13	7	33	27	67	13	33	37	33
Student JS	30	40	27	33	43	40	43	40	40	40
Student RR	7	53	23	73	40	67	47	60	40	53
Student SAS	53	67	70	60	50	80	50	60	57	53
Student AJS	37	13	27	47	30	27	47	33	27	13

Notes.

1. All scores are in percentages.
2. L = Linguistic, AL= Analytical-Logical, S = Spatial, P = Personal, PM = Physical-Mechanical
3. S = Standardised Administration, T = Extended Time Form.

Student BR's performance on the Extended Time Form of the MPT-5 has improved for all the five subtests. Student SS's performance has improved on the Extended Time Form in three of the MPT-5 subtests and has retained the same score on one subtest. Student JS's performance on the Extended Time Form is more equivocal, since he has performed better on two of the subtests, poorer on two subtests, and has obtained the same score on the Standardised and Extended Time forms on one of the subtests. Student RR's performance has improved on the Extended Time Form in all the five subtests. Students SAS has performed better on the Extended Time Form in three of the subtests and poorer in two subtests. Student AJS has performed better in the standardised test in four subtests and has performed better on one subtest on the Extended Time Form.

Summary of findings. In summary, most students have increased their scores on varying number of subtests with the Extended Time Form. While four students

performed better at the Extended Time Form in one, two, or three subtests, two students have performed better in the Extended Time Form in all five subtests.

4.3.1.2. ***Comparison of performance of the Study Group on Extended Time Form against the Comparison Group***. The 15 items that comprised the Extended Time Form of the test were separated and the inter-quartile range was derived for the five subtests of the MPT-5 from the performance of the Comparison Group on these items. Table 15 interprets the performance of the Study Group on the Extended Time Form against the inter-quartile range derived from the performance of Comparison Group on five subtests of the MPT-5.

Table 15

Comparison of performance of the Study Group on the Extended Time Form against the inter-quartile range derived from the performance of Comparison Group on the five subtests of the MPT-5

	L Mean score obtained by Comparison Group = 9.16	**AL** Mean score obtained by Comparison Group = 9.52	**S** Mean score obtained by Comparison Group = 9.23	**P** Mean score obtained by Comparison Group = 6.88	**PM** Mean score obtained by Comparison Group = 6.97
	Inter-Quartile Range for the Extended Time Form of MPT-5				
Quartile 1	0-7	0-8	0-8	0-5	0-5
Quartile 2	8-9	9-10	9-10	6-7	6-7
Quartile 3	10-11	11-12	11	8	8-9
Quartile 4	11-15	13-15	12-15	9-12	10-15
	Score Obtained (Interpretation)				
Student BR	5 (VL)	7 (VL)	10 (L)	6 (L)	9 (H)
Student SS	2 (VL)	5 (VL)	10 (L)	5 (VL)	5 (VL)
Student JS	6 (VL)	5 (VL)	6 (VL)	6 (L)	6 (L)
Student RR	8 (L)	11 (H)	10 (L)	9 (VH)	8 (H)
Student SAS	10 (H)	9 (L)	12 (VH)	9 (VH)	8 (H)
Student AJS	2 (VL)	7 (VL)	4 (VL)	5 (VL)	2 (VL)

Notes:

1. Scores range from 0 to 15.
2. L = Linguistic, AL= Analytical-Logical, S = Spatial, P = Personal, PM = Physical-Mechanical
3. VL = very low, L = low, H = high, VH = very high

Student BR's performance in two subtests fall in the *very low* category, two subtests fall in the *low* category and one subtest falls in the *high* category. Student SS's performance in four subtests fall in the *very low* category and one subtest falls in the *low* category. Student JS's performance in three subtests fall in the *very low* category and two subtests fall in the *low* category. Student RR's performance in two subtests fall in the *low* category, two subtests fall in the *high* category and one subtest falls in

the *very high* category. Student SAS's performance in one subtests falls in the *low* category, two subtests fall in the *high* category and two subtests fall in the *very high* category. Student AJS's, performance in all five subtests fall into the *very low* category.

Summary of findings. In summary, while Table 14 showed that many students improved their performance with the Extended Time Form, Table 15 indicates that most of the test results with the Time Extended form are still in the *low* and *very low* range as against the Comparison Group. Of the thirty test results reported (the five tests taken by each of the six students with dyslexia), 14 test results have 75% of the students in the Comparison Group perform above it. Of the remaining, eight test results have 50% of students in the Comparison Group above the performance of the Study Group. Five test results have 25% of students in the Comparison Group ahead in performance, and three test results are with the top 25% in terms of the performance of the Comparison Group.

4.3.1.3. Comparison of performance of Study Group in the Tests and Me Questionnaire for the Extended Time Form against the standardised aptitude test.

The Study Group was administered the Tests and Me Questionnaire after taking the standardised aptitude test as well as the Extended Time Form of the test. The aim of this analysis is to understand the difference in the difficulty reported by the students in the Study Group in taking the two forms of this test. Table 16 reports the scores of the Tests and Me Questionnaire in both the administrations.

Table 16

Within Group Tests and Me Scores of the Study Group to Assess Difficulty in Test-Taking on the Standardised Administration Versus the Extended Time Form of the MPT-5

	Standardised test		**Extended Time Form**	
	Score	**Interpretation**	**Score**	**Interpretation**
Student BR	64	Very high difficulty	79	High difficulty
Student SS	56	Very high difficulty	66	Very high difficulty
Student JS	84	Low Difficulty	91	Low difficulty
Student RR	95	Very low difficulty	110	Very low difficulty
Student SAS	106	Very low difficulty	106	Very low difficulty
Student AJS	62	Very high difficulty	78	High difficulty

Notes:

1. Scores range from minimum 20 to maximum 120.
2. Higher score indicates lower difficulty

Five of the six students have higher Tests and Me scores for the Extended Time Form indicating that they experienced lower difficulty with this form as compared to the standardised administration. For two of these students, the difficulty level changed from *very high* difficulty to *high* difficulty. One student's (Student SAS) score is the same for both versions indicating that she experienced the same level of difficulty with both the forms (*very low* difficulty).

Summary of findings. Five students expressed lower difficulty with the Extended Time Form as compared to the standardised test while one student expressed the same level of difficulty for both the forms.

4.3.1.4. Summary of the Study Group's performance on the Extended Time Form.

This section presents the summary of the Study Group's performance on the Extended Time Form drawing from the information presented in Tables 14, 15, and 16.

Student BR's performance in four subtests is in the *low* and *very low* category and one subtest is in the *high* category as compared to the Comparison Group (Table 15). However, as seen in Table 14, he has benefitted from the Extended Time Form and has performed better in all the five sub-tests compared to the standardised test. His reported level of difficulty has decreased from the *very high* difficulty to the *high* difficulty category for the Extended Time Form (Table 16).

Student SS's performance in all the five subtests is in the *low* and *very low* category compared to the Comparison group (Table 15). However, she has performed better in the Extended Time Form as compared to the standardised test in three subtests and in one subtest she has obtained the same marks in both the forms as seen in Table 14. This indicates that she seems to have benefitted to some extent from the Extended Time Form. Though she reports *very high* difficulty with both the forms, the higher score for the Extended Time Form indicates lower difficulty compared to the standardised test (Table 16).

Student JS's performance on the Extended Time Form in all the five subtests is in the *low* and *very low* category compared to the Comparison Group (Table 15). He has performed better in the standardised test in two of the five subtests and has same scores in the Extended Time Form and the standardised form in one subtest as seen in Table 14. This indicates that he does not seem to have benefitted from the Extended

Time Form. His Tests and Me scores indicate *low difficulty* for both the forms, with higher score for the Extended Time Form indicating lower difficulty (Table 16).

Student RR's performance in two subtests falls in the *low* category and three subtests in the *high* and *very high* categories in comparison to the performance of the Comparison group (Table 15). As seen in Table 14, she has performed better in this form compared to her performance in the standardised aptitude test in all the five subtests. This indicates that she has benefitted the most from the Extended Time Form. She reports *very low* difficulty with both the standardised test and the Extended Time Form, however, her score for the Extended Time Form has increased indicating lower level of difficulty compared to the standardised test (Table 16).

Student SAS's performance in all three subtests fall in the *high* and *very high* category compared to the Comparison group and two subtests fall in the *low* category (Table 15). She has performed better in the Extended Time Form as compared to the standardised test in three subtests as seen in Table 14. She also seems to have benefitted to some extent from the Extended Time Form. She reports *very low* level of difficulty with the same score for both the forms (Table 16).

Student AJS's performance in all the five subtests falls in the *very low* category as compared to the Comparison Group (Table 15). However, he seems to have least benefitted from the Extended Time Form. As seen in Table 14, he has performed better in the standardised aptitude test in four of the five sub-tests. His reported level of difficulty for both the standardised test and the Extended Time Form remains in the *very high* category (Table 16). Although he remains in the *very high* category, going just by his scores, his Extended Time Form difficulty score has increased as compared to the standardised test, indicating lower difficulty (Table 16).

4.3.2. Performance of the Study Group on the Oral Form.

A three-step analysis was used to examine the performance of the students on the Oral Form: (a) comparison with their own performance on the standardised administration of the aptitude test, (b) comparison with that of the Comparison group, and (c) comparison using the Tests and Me Questionnaire for the Oral Form and the standardised aptitude test.

4.3.2.1. Within Group Comparison the Study Group's performance on the Oral Form of the MPT-5.

As with the Extended Time Form, this study aims to investigate the possibility that the Oral Form would have a differential impact on test performance across members of the Study Group. The results of this analysis are presented in Table 17 which compares the performance of the Study Group on the Oral Form with its performance on the standardised administration of the MPT-5.

Table 17

Within Group Comparison of the Study Group's Performance on the Oral Form of the MPT-5

	L		AL		S		P		PM	
	S	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**
Student BR	27	40	33	40	33	60	30	33	47	40
Student SS	13	67	7	40	27	40	13	47	37	40
Student JS	30	60	27	40	43	33	43	47	40	53
Student RR	7	20	23	33	40	33	47	40	40	20
Student SAS	53	27	70	13	50	7	50	47	57	13
Student AJS	37	7	27	27	30	7	47	13	27	27

Notes:

1. All scores are in percentages.
2. L = Linguistic, AL= Analytical-Logical, S = Spatial, P = Personal, PM = Physical-Mechanical
3. S = Standardised Administration, O = Oral Form.

Student BR and JS have performed better in the Oral Form in four of five subtests. In one subtest, they have performed better at the standardised test. Student SS has performed better in the Oral Form in all five subtests. Student RR has performed better in the Oral Form in two of five subtests. In three subtests, she has performed better at the standardised test. Student SAS has performed better in the standardised subtest in all five subtests. Student AJS has performed better in the standardised test in three of five subtests. In two subtests, he has obtained same scores on the standardised test and the Oral Form.

Summary of findings. In summary, most students have increased their scores on varying number of subtests with the Oral Form. While three students performed better at the Oral Form in two or four subtests, two students have performed better in the Oral Form in all five subtests. One student obtained the same score in the

standardised test and the Oral Form in two subtests while yet another student performed better on the standardised test as compared to the Oral Form on all subtests.

4.3.2.2. ***Comparison of performance of Study Group on the Oral Form against the Comparison Group***. The 15 items that comprised the Oral Form of the test were separated and the inter-quartile range was derived for the five subtests of the MPT-5 from the performance of the Comparison Group on these items. Table 18 interprets the performance of the Study Group on the Oral Form against the inter-quartile range derived from the performance of Comparison Group on five subtests of the MPT-5.

Table 18

Comparison of Performance of Study Group on the Oral Form Against the Inter-Quartile Range Derived from the Performance of Comparison Group on the Five Subtests of the MPT-5

	L Mean score (SD) obtained by Comparison Group = 8.37 (2.63)	**AL** Mean score (SD) obtained by Comparison Group = 8.39 (3.48)	**S** Mean score (SD) obtained by Comparison Group = 6.87 (2.40)	**P** Mean score (SD) obtained by Comparison Group = 8.20 (2.10)	**PM** Mean score (SD) obtained by Comparison Group = 8.10 (2.43)
	Inter-Quartile Range for the Oral Form of MPT-5				
Quartile 1	0-7	0-6	0-5	0-7	0-6
Quartile 2	8-9	7-9	6-7	8	7-8
Quartile 3	10	10-11	8-9	9-10	9-10
Quartile 4	11-15	12-15	10-15	11-15	11-15
	Score Obtained (Interpretation)				
Student BR	6 (VL)	6 (VL)	9 (H)	5 (VL)	6 (VL)
Student SS	3 (VL)	6 (VL)	6 (L)	7 (VL)	6 (VL)
Student JS	9 (L)	6 (VL)	5 (VL)	7 (VL)	8 (L)
Student RR	3 (VL)	5 (H)	5 (VL)	6 (VL)	3 (VL)
Student SAS	4 (VL)	2 (L)	1 (VL)	7 (VL)	2 (VL)
Student AJS	1 (VL)	4 (VL)	1(VL)	2 (VL)	4 (VL)

Notes:

1. Scores range from 0 to 15.
2. L = Linguistic, AL= Analytical-Logical, S = Spatial, P = Personal, PM = Physical-Mechanical
3. VL = very low, L = low, H = high, VH = very high

Student BR's performance in four subtests fall in the *very low* category and one subtest falls in the *high* category. Student SS's performance in four subtests fall in the *very low* category and one subtest falls in the *low* category. Student JS's performance in three subtests fall in the *very low* category and two subtests fall in the *low* category.

Student RR's performance in four subtests fall in the *very low* category and one subtest falls in the *high* category. Student SAS's performance in four subtests fall in the *very low* category and one subtest falls in the *low* category. Student AJS's performance in all five subtests fall into the *very low* category.

Summary of findings. In summary, while Table 17 showed that many students improved their performance with the Oral Form, Table 18 indicates that most of the test results with the Oral form are still in the *low* and *very low* range as against the Comparison Group. Of the thirty test results reported (the five tests taken by each of the six students with dyslexia), 24 test results have 75% of the students in the Comparison Group perform above it. Of the remaining, four test results have 50% of students in the Comparison Group above the performance of the Study Group, and two test results have 25% of students in the Comparison Group ahead in performance.

4.3.2.3. Comparison of performance of Study Group in the Tests and Me Questionnaire for the Oral Form against the standardised aptitude test.

The Study Group was administered the Tests and Me Questionnaire after taking the standardised aptitude test as well as the Oral Form of the test. The aim of this analysis is to understand the difference in the difficulty reported by the students in the Study Group in taking the two forms of this test. Table 19 reports the scores of the Tests and Me Questionnaire in both the administrations.

Table 19

Within Group Tests and Me Scores of the Study Group to Assess Difficulty in Test-Taking on the Standardised Administration Versus the Oral Form of the MPT-5

	Standardised test		Oral form	
	Score	**Interpretation**	**Score**	**Interpretation**
Student BR	64	Very high difficulty	72	Very high difficulty
Student SS	56	Very high difficulty	79	High difficulty
Student JS	84	Low difficulty	100	Very low difficulty
Student RR	95	Very low difficulty	103	Very low difficulty
Student SAS	106	Very low difficulty	79	High difficulty
Student AJS	62	Very high difficulty	57	Very high difficulty

Notes:

1. Scores range from minimum 20 to maximum 120.
2. Higher score indicates lower difficulty

Four of the six students have higher Tests and Me score for the Oral Form indicating that they experienced lesser difficulty with this form. For one of these students, the difficulty level decreased from *low* difficulty to *very low* difficulty and for another student, the difficulty level decreased from *very high* difficulty to *high* difficulty. Two students (Students AJS and SAS) scored lower scores in the Oral Form indicating higher difficulty with this form.

Summary of findings. Four students expressed lower difficulty with the Oral Form as compared to the standardised test while two students expressed higher difficulty with the Oral Form.

4.3.2.4. Summary of Study Group's performance on the Oral Form.

This section presents the summary of the Study Group's performance on the Oral Form drawing from the information presented in Tables 17, 18, and 19.

Student BR's performance in four subtests is in the *very low* category and one subtest is in the *high* category as compared to the Comparison Group (Table 18). As seen in Table 17, he has performed better in four subtests in the Oral Form as compared to the standardised test. This indicates he has benefitted from the Oral Form. His reported level of difficulty for both the forms is *very high*, however, the higher score for the Oral Form indicates lower level of difficulty compared to the standardised test (Table 19).

Student SS's performance is in the *low* and *very low* category compared to the Comparison Group in all the five subtests (Table 18). She has performed better in the Oral Form as compared to the standardised test in all five subtests as seen in Table 17. She seems to have benefitted most from the Oral Form. Her higher score in the Oral Form (*high* difficulty) indicates lower difficulty compared to the standardised test (*very high* difficulty) (Table 19).

Student JS's performance in the Oral Form in all the five subtests is in the *low* and *very low* category compared to the Comparison Group (Table 18). He has performed better in the Oral Form in four out of the five subtests as seen in Table 17. He seems to have benefitted from the Oral Form. His Tests and Me scores are higher for the Oral Form (*very low* difficulty) compared to the standardised test (*low* difficulty), indicating lower difficulty (Table 19).

Student RR's performance in all subtests falls in the *low* category and *very low* categories in comparison to the performance of the Comparison Group (Table 18). She has performed better in this form in two subtests compared to her performance in the standardised aptitude test as seen in Table 17. She has benefitted to some extent from the Oral Form. She reports *very low* difficulty with both the standardised test

and the Oral Form, however, her score for the Oral Form has increased indicating lower level of difficulty compared to the standardised test (Table 19).

Student SAS's performance in all five subtests fall in the *low* and *very low* category compared to the Comparison Group (Table 18). She has performed better in the standardised test in all the five subtests as seen in Table 17. She also seems to have benefitted the least from the Oral Form. Her Tests and Me scores are lower for the Oral Form (*high* difficulty) compared to the standardised test (*very low* difficulty) indicating more difficulty with the Oral Form (Table 19).

Student AJS's performance in all the five subtests falls in the *very low* category as compared to the Comparison Group (Table 18). He has performed better in the standardised aptitude test in three of the five sub-tests as seen in Table 17. He does not seem to have benefitted from the Oral Form. His reported level of difficulty for both the standardised test and the Oral Form is *very high* (Table 19). His score for the Oral Form has decreased as compared to the standardised test, indicating higher difficulty (Table 19).

4.3.3. Performance of the Study Group on the Extended Time Form compared to the Oral Form of the test.

After having compared the performance of Study Group on the Extended Time Form and the Oral Form with their performance on the standardised test, this study also aims to investigate the possibility that the Extended Time Form and the Oral Form would have a differential impact on test performance across members of the Study Group. A two-step analysis was used to examine this: (a) comparison of their own performance on the Extended Time Form compared to the Oral Form, and (b)

comparison using the Tests and Me Questionnaire for the Extended Time Form and the Oral Form.

4.3.3.1. Within Group Comparison of the Study Group's performance on the Extended Time Form and the Oral Form of the MPT-5.

The results of this analysis are presented in Table 20 which compares the performance of the Study Group on the Extended Time Form and the Oral Form of the MPT-5.

Table 20

Within Group Comparison of the Study Group's Performance on the Oral Form and Extended Time Form of the MPT-5

	L		**AL**		**S**		**P**		**PM**	
	T	**O**	**T**	**O**	**T**	**O**	**T**	**O**	**T**	**O**
Student BR	33	40	47	40	67	60	40	33	60	40
Student SS	13	67	33	40	67	40	33	47	33	40
Student JS	40	60	33	40	40	33	40	47	40	53
Student RR	53	20	73	33	67	33	60	40	53	20
Student SAS	67	27	60	13	80	7	60	47	53	13
Student AJS	13	7	47	27	27	7	33	13	13	27

Notes:
1. All scores are in percentages.
2. L = Linguistic, AL= Analytical-Logical, S = Spatial, P = Personal, PM = Physical-Mechanical
3. T = Extended Time Form, O = Oral Form.

Student BR has performed better in the Extended Time Form in four of five subtests and better in the Oral Form in one of five subtests. Students SS has performed better in the Oral Form in four of five subtests and better in the Extended Time Form in one of five subtests. Students JS has performed better in the Oral Form in four of five subtests and better in the Extended Time Form in one of five subtests. Student RR has

performed better in the Extended Time Form in all the five subtests. Student SAS has performed better in the Extended Time Form in all the five subtests. Student AJS has performed better on the Extended Time Form in four of five subtests. In one subtest, he has performed better at the Oral Form.

Summary of findings. In summary, while some students have performed better on the Extended Time Form, others have performed better on the Oral Time Form. Four students have performed better on the Extended Time Form as compared to the Oral Form while two students show the reverse trend.

4.3.3.2. Comparison of performance of the Study Group in the Tests and Me Questionnaire for the Extended Time Form against the Oral Form.

The Study Group was administered the Tests and Me Questionnaire after taking the Extended Time Form as well as the Oral Form of the test. The aim of this analysis is to understand the difference in the difficulty reported by the students in the Study Group in taking the two forms of this test. Table 21 reports the scores of the Tests and Me Questionnaire in both the administrations.

Table 21

Within Group Tests and Me Scores of the Study Group to Assess Difficulty in Test-Taking on the Extended Time Form Versus the Oral Form of the MPT-5

	Extended Time Form		Oral Form	
	Score	**Interpretation**	**Score**	**Interpretation**
Student BR	79	High difficulty	72	Very high difficulty
Student SS	66	Very high difficulty	79	High difficulty
Student JS	91	Low difficulty	100	Very low difficulty
Student RR	110	Very low difficulty	103	Very low difficulty
Student SAS	106	Very low difficulty	79	High difficulty
Student AJS	78	High difficulty	57	Very high difficulty

Notes:

1. Scores range from minimum 20 to maximum 120.
2. Higher score indicates lower difficulty

Four students have higher scores for the Extended Time Form indicating lower difficulty. Two students have higher scores for the Oral Form indicating lower difficulty with this form.

Summary of findings. While two students found higher difficulty with the Extended Time Form, two students found higher difficulty with the Oral Form.

The next table, Table 22, summarises the Study Group's performance in the standardised test, the Extended Time Form, and the Oral Form. It also summarises the comparison between their performance on the Extended Time Form and the Oral Form. Based on this, the researcher gives her impressions regarding the effectiveness of the two alternate forms for each student.

Table 22

Summary of Performance of Study Group on the Standardised Aptitude Test and the Two Alternate Forms of the Test

	Performance on Standardised Test	**Performance on Extended Time Form**	**Performance on Oral Form**	**Comparison between Extended Time Form and Oral Form**	**Tests and Me**	**Impressions on the effectiveness of the alternate forms**
Student BR	Lower than T in five subtests. Lower than O in four subtests and higher than O in one subtest.	Higher than S in all five subtests.	Higher than S in four subtests and lower than S in one subtest	Higher in T in four subtests. Higher in O in one subtest.	Higher score in T indicates less difficulty with T compared to O.	Both the alternate forms were helpful. The Extended TimeForm seems to be more helpful than the Oral Form.
Student SS	Higher than T in one subtest, lower than T in three subtests, and same as T in one subtest. Lower than O in all five subtests.	Higher than S in three subtests and lower than S in one subtest. Same score as S in one subtest.	Higher than S in all subtests	Higher in T in one subtest. Higher in O in four subtests	Higher score in O indicates less difficulty with O compared to T.	Both the alternate forms were helpful. The Oral Form seems to be more helpful than the Extended Time Form.

Student JS	Lower than T in two subtests, higher than T in two subtests, and same as T in one subtest. Lower than O in four subtests, higher than O in one subtest.	Higher than S in two subtests. Lower than S in two subtests,and same as S in one subtest.	Higher than S in four subtests and lower than S in one subtest.	Higher in T in one subtest. Higher in O in four subtests.	Higher score in O indicates less difficulty with O compared to T.	The Oral Form was helpful. The Extended Time Form was not helpful.
Student RR	Lower than T in five subtests. Lower in O in two subtests and higher in O in three subtests.	Higher than S in all five subtests.	Higher than S in two subtests. Lower than S in threesubtests.	Higher in T in all five subtests.	Higher score in T indicates less difficulty with T compared to O.	The Extended Time Form was more helpful than the Oral Form.
Student SAS	Higher than T in two subtests and lower than T in three subtests. Higher than O in all five subtests.	Higher than S in three subtests and lower than S in two subtests.	Lower than S in all five subtests.	Higher in T in all five subtests.	Higher score in T indicates less difficulty with T compared to O.	The Extended Time Form was helpful. The Oral Form was not helpful.

Student AJS	Higher than T in four subtests and lower than T in one subtest. Higher than O in three subtests and same as O in two subtests.	Lower than S in four subtests and higher than Sin one subtest.	Lower than S in three subtests and same as S in two subtests.	Higher in T in four subtests. Higher in O in one subtest.	Higher score in T indicates less difficulty with T compared to O.	Both the alternate forms were not helpful.

Note: S = Standardised Test, T = Extended Time Form, O = Oral Form

Table 22 shows that except in the case of AJS, one or the other of the two accommodations contributed to improving performance on the MPT-5. The Oral Form emerges as being relatively more helpful in two cases, the Extended Time Form being more helpful in three cases, and nether accommodation showing improvement in performance in one case. The students' scores on the Tests and Me also indicates that the while four students experienced lesser difficulty with the Extended Time Form, two students experienced lesser difficulty with the Oral Form. It is important to note that the two students who had done better in the Oral Form compared to the Extended Time Form also reported lesser difficulty with this Form compared to the Extended Time Form. Similarly, the three students who had done better in the Extended Time Form compared to the Oral Form also reported lesser difficulty with this Form compared to the Oral Form. The student whose performance did not improve with both the alternate forms reported, however, reported lesser difficulty with the Extended Time Form as compared to the Oral Form.

Summary of findings. On the whole, the accommodations have had an effect on the performance of the members of the Study Group. Students BR, RR, and SAS have performed better at the Extended Time Form and reported lesser difficulty with this form. Students JS and SS have performed better at the Oral Form and reported lesser difficulty with this form. Student AJS did not improve his performance on either of the alternate forms but reported lesser difficulty with the Extended Time Form. An important observation to be made here is that while there are broad group trends, there are significant individual variations all through the data. As discussed in the earlier chapters, this was anticipated, given the very nature of dyslexia. It was postulated earlier, that this variation could be related to the learning skills profile of each individual student in the Study Group. Also, an overall objective of this research

is to explore the possibility of developing a system to formulate a learning skills profile that would help the career counsellor decide which accommodation (Extended Time Form or Oral Form) would best suit a given individual with dyslexia. With these two objectives in mind, the chapter now moves to understanding the linkages between students' learning skills profile and their performance on the standardised and accommodated forms of the MPT-5.

4.4. Findings from the Learning Skills Profile

As described in the Methodology chapter, the Learning Skills Profile (LSP) tool was developed specifically for this study to build a learning skills profile for each student in the Study Group. The development and inclusion of this tool rests upon the researcher's observation that although an individual can carry a diagnosis of dyslexia, individual specific variations exist in the manifestation of the features of dyslexia. This observation is also borne out in the findings of other researchers as shown in the review of literature. A prominent area in which these variations are seen with reference to the individual's learning skills. Hence Learning Skills Profile (LSP) Tool was developed for this study. The LSP Tool was adapted from the International Classification of Functioning, Health and Disability-Children and Youth Version (ICF-CY, WHO, 2002). This tool aims to plot the student's strengths and weaknesses in six areas related to test-taking: attention, memory, visual perception, reading comprehension, oral comprehension, and writing. The information required to build the Learning Skills Profile was gathered from interviews with the parent and the student and examination of the student's assessment reports. Table 23 presents the learning skills profile of each student in the Study Group.

Table 23
Learning Skills Profiles of Students in the Study Group

	Attention	Memory	Visual Perception	Reception of Spoken Language	Reception of Written Language	Writing
Student AJS	3	0	2	1	3	3
Student BR	3	1	2	1	3	2
Student JS	2	2	2	3	2	2
Student RR	0	0	2	0	3	1
Student SS	0	0	3	0	3	2
Student SAS	0	0	1	0	0	2

Note: 0=no difficulty, 1=mild difficulty, 2=moderate difficulty, 3=severe difficulty, 4=complete difficulty

4.4.1. Summary of findings from the Learning Skills Profile Tool

One of the reasons for the development of the Learning Skills Profile Tool was to aid the career counsellor in the selection of the most relevant accommodation for a student with dyslexia. The findings show that the Learning Skills Profile Tool can yield information that can inform the selection of the most suitable form of accommodation in the following ways:

- The Extended Time Form has been found to be helpful with students whose learning skills profile reveals challenges in visual perception and reading comprehension. This may be because the extra time (a) allows test completion, (b) more time to read and understand the questions, (c) time for self-correction.
- Difficulties in other areas such as memory may affect the performance on the Extended Time Form. Therefore, it is likely that the Oral Form may be better suited for students whose learning skills profile shows difficulties with memory.

- Difficulty in the area of learning comprehension can negatively affect performance in the Oral Form. Therefore, it is likely that the Oral Form may be better suited for students whose learning skills profile shows difficulties with oral comprehension.
- Performance in the Oral Form is more dependent on familiarity with the oral administration method. Therefore, it is likely that the students who are not familiar with oral administration methods may not benefit from the Oral Form.

Keeping in view the individual variations seen across each member of the Study Group, a case study approach was taken and the next analysis was conducted on a more individualised basis, examining the learning skills profile of each student independent of the performance of other individuals in the group.

4.5. Case Study Reports of the Members of the Study Group

This study has used the case study method to study the issue of test-taking difficulties of students with dyslexia. This study examines six students with dyslexia and gathers data from quantitative methods like tests as well as qualitative methods such as interviews. The case study method attempts to understand an event in the context within which it occurs. Such contextual grounding is considered to be important in understanding the test-taking behaviour of children with dyslexia. Also, the research is interested in understanding variations in the profiles of children with dyslexia. The case study method renders itself more suitable for exploring these variations..Hence, the case study method was used for this research.

4.5.1. Background to the members of the Study Group

Descriptions provided in this section are an attempt not just to explain behaviour, but the milieu as well, such that the behaviour can be understood from the broader perspective of the students' context. For each student in the Study Group,

information is provided about early childhood history, family background, and educational history as gathered from the parents and school records. It provides a profile of the strengths and weaknesses of each student in the different areas of the Multiple Potentials Framework (Linguistic, Analytical-Logical, Spatial, Personal, and Physical-Mechanical) elicited through interviews with the parents and students. The student's diagnosis of dyslexia is discussed. All the students in the Study Group have been diagnosed with dyslexia based on assessments by qualified psychologists. It is to be noted, however, that this research did not engage in diagnosing students for dyslexia. Instead, the chapter presents the information and formal diagnosis of the student's condition as extracted from assessment reports provided by other professionals who have assessed the student. The researcher examined the assessment reports of all students in the Study Group. It was noted that different psychologists used different assessment tools to evaluate the student. While some reports presented scores obtained on the different tests that were administered, other reports presented a narrative description of the difficulties. The reports also varied in the domains that were assessed and the level of detail with which the assessment was reported. While the purpose of some reports seemed to be to provide a description of the student's current level of functioning, other reports were brief and only confirmed the presence of dyslexia in order to help the student to avail concessions from the education board. The material gleaned from the above sources is further examined in the light of information about the student's learning profile which was obtained from the Learning Skills Profile Tool administered to the students and their parents. Since one of the main aims of this research is to examine the use of standardised career counselling tests with children with dyslexia, this chapter also highlights the students' experience with test-taking at school and the support received through school.

4.5.2. Educational background of the students of the Study Group.

The Study Group comprises six students studying in Grade 10. The group has been drawn from two schools.

School 1 specialises in the needs of children with special needs such as learning disabilities, attention deficit and/or hyperactivity disorder, and autism spectrum disorder. Five of the students in the Study Group for this research have been drawn from School 1. This school follows the National Institute of Open Schooling (NIOS) Board. The NIOS is one of the three most well-known central Boards of Education in India, the other two being the Central Board of Secondary Education (CBSE) and the Council for the Indian School Certificate Examination (CISCE). The NIOS was set up in 1989 and it offers programmes from the elementary level to the pre degree (higher secondary) level through open and distance learning (NIOS, n.d.). In the secondary level (Grade 10) and senior secondary level (Grade 12), the student is required to select a minimum of five and maximum of seven subjects. The NIOS offers flexibility of subject selection and also allows the student to take up a combination of academic and vocational subjects. In this school, the students complete the secondary level over 2 years by completing 2 or 3 subjects in a year. Three students in this group are in the second year of senior level while two students are in the first year. The school adopts differential teaching methods to suit the learning requirements of each student.

School 2 follows the International General Certificate of Secondary Education (IGCSE) Board. One student in Study Group for this research has been drawn from School 2. The IGCSE system followed by School 2 is one of the most popular international boards in the country. Here, the 'O' level is equivalent to Grade 10 and

'A' level is equivalent to Grade 12. The IGCSE board also offers its students flexibility in subject selection compared to the Indian boards. The school promotes several extracurricular activities that are aimed at the holistic development of students.

4.5.3. Observations during test administration.

The students were observed during the test-taking. The clarifications asked for by the students were of two types: (1) about the testing process, and (2) about specific items in the test. Questions about the testing process were mainly about the timed nature of the test, the type of questions, and availability of concessions. Some of the questions that were asked were: "Can I answer that last test now?" (RR upon completing one subtest, referring to the previous subtest that she could not complete). "Can he read out the questions for me? I also have someone read out for me." (BR requesting for his friend to read out questions to him before the test started). "What type of questions are there? Are they difficult?" (SS). "Is there any Math cos I suck at Math" (SS). "We have to answer all five of them? Like, all five of them?" (AJS). Queries were clarified before the test began.

The overarching impression obtained is that most students in the Study Group were unaware or were out of touch with standardised testing procedures in schools as a result of the individual-sensitive testing practices that were followed in their schools.

The next sections will describe each student in detail.

4.6. The Case of Student 1: BR

4.6.1. Early childhood.

BR is a 15-year-old boy. He is of slight build and appeared to be shy and soft spoken. Interactions with BR's father indicated that there were delays in his speech and walking and that BR suffered from stammering during his childhood. BR was described to be physically weak as a child. He was underweight during most of his childhood. He also constantly lagged behind in academics and was very timid and shy in school. However, after around 13 years of age, he became more involved in sports after which his weight and physical capacity improved.

4.6.2. Family background.

BR's family comprises his parents and a younger brother. His father works as a manager in a company and both his parents are also involved in the management of a school. His younger sibling is currently pursuing Grade 3 and studies in a regular school. His father reported that there are no known incidences of learning disability in their family. A main concern reported by the father is BR's casual approach towards his academics. According to the father, BR is not serious towards his studies and spends more time on games and sports and does not put the required effort into academics.

4.6.3. Schooling history.

BR has a history of multiple school shifts. He completed his education from lower kindergarten to Grade 2 in a school under the Central Board of Secondary Education. Owing to weak academic performance, he was shifted to another school where he pursued Grades 3 and 4. Since the family was not happy with the method of education in this school he was shifted again to another school under the Central

Board of Secondary Education in Grade 5. However, he was not able to catch up with his peers and was constantly lagging behind in his academics. BR was shifted to the current school in Grade 6. He has completed 5 years of schooling in the present school (Grade 6 to first year of Grade 10). In his first year of secondary level, he is pursuing the subjects English, home science, and data entry operation.

4.6.4. Language fluency.

BR's mother tongue is Telugu. He knows five languages and reported fluency in these languages as follows:

Table 24
Language fluency reported by BR

Language fluency reported by BR			
Language	**Speaking**	**Reading**	**Writing**
Telugu	Fluent	Poor	Poor
Tamil	Average	Poor	Poor
English	Fluent	Average	Average
Hindi	Average	Poor	Poor
Kannada	Fluent	Poor	Poor

4.6.5. Profile of strengths and weaknesses.

BR does not enjoy Linguistic activities and engages in reading and writing only when they are compulsory. The Analytical-Logical area also does not seem to be a high point for BR. He is described to be weak with even with the basic concepts of mathematics and science. He likes playing chess but has not shown planfulness in any other areas. Spatial activities seem to an area of strength. BR's father reports that he is good with art and craft. He can draw well. He also seems to be good with Personal skills and his father describes him as being good with people. He is friendly

and easy-going. In the Physical-Mechanical area, of late, he has developed interest in sports, and plays different types of sports such as football, cricket, and tennis. However, he is not mechanically inclined.

BR does not seem to have given any serious thought to his career development. His career aspiration is to become a magician or to get into business. He was not able to explain further as to why he wanted to get into these careers.

4.6.6. Diagnosis.

BR's most recent assessment was conducted two years ago when he was 12 years old. The report states his diagnosis as "mixed difficulties in reading, writing and spelling". While the report does not comment on attention, BR's father reports that his ability to concentrate on a task "is limited". His average attention span is about 15-20 minutes. The report (written two years ago) indicated that his reading and spelling were at the Grade 1 level. While both BR as well as his father indicate that he does not face difficulties with reading, BR reports that he does not like reading. His father states that he reads only when there is compulsion. Reading comprehension also seems to be an area of difficulty. BR says that he can understand better when a topic is explained to him rather than by reading it himself. He usually needs to read the text multiple times or have the text explained to him in order to understand it. The assessment reports indicate that BR's writing showed difficulties with grammar and spellings. BR reports that writing is difficult for him, especially when he has to write for long stretches of time. BR states, "I'll be writing. . . I'll think one to write but when I write it'll be another". BR often experiences such difficulties when writing exams. The reported IQ was 92 which falls in the average

range. His performance in mathematics is reported to be better than other areas but below the expected level.

4.6.7. Experience of exams and support received at school.

In the current school, BR receives one-to-one support to help him with his difficulties in the areas of reading and writing. He reports that individual attention from the teacher helps him to understand concepts that he cannot follow during the regular group teaching sessions. During school tests, he avails the support of a reader.

BR reports that earlier he used to hate exams. He has found the one-to-one support offered to him in the current school to be helpful. He especially finds the provision of a reader during his exams to be helpful.

4.6.8. Learning skills profile.

Table 25 presents the learning skills profile of BR.

Table 25
Learning Skills Profile of BR

Learning Skills Profile of BR					
Attention	**Memory**	**Visual Perception**	**Reception of Spoken Language**	**Reception of Written Language**	**Writing**
3	1	2	1	3	2

Note: 0=no difficulty, 1=mild difficulty, 2=moderate difficulty, 3=severe difficulty, 4=complete difficulty

For BR, the highest levels of difficulty seem to be with attention and reception of written language. Difficulties in these areas are in the severe range. Difficulties in the other areas are in the in the mild to moderate range.

4.6.9. Performance on the MPT-5.

Overall, BR also reports significant difficulties with test-taking. However, his performance has improved on both the alternate forms of the test with his better performance being on the Oral Form. It must be kept in mind that his performance on four of the five subtests on both the alternate forms is in the *low* and *very low* category compared to the Comparison Group.

BR's learning skills profile shows he has severe difficulties with attention and reading comprehension, and moderate difficulties with visual perception. The Extended Time Form may have benefitted him as it gave him more time to read and understand the questions. His improved performance on the Oral Form may be due to lower difficulty in the area of oral comprehension.

4.6.10. Summary.

BR is a 15-year old boy with normal IQ. His learning skills profile indicates that he experiences challenges in the areas of attention, visual perception, reading comprehension, and writing. BR has benefitted from the Extended Time Form and the Oral Form of the MPT-5. The improvement in performance on the Time Form may be because the extra time helped him to deal with difficulties faced in reading as a result of difficulties with visual perception and reading comprehension. His performance on the Oral Form ties in with his learning skills profile which shows only mild difficulty with oral comprehension, as also evidenced by his improvement in performance when he has the services of a reader. However, this mild difficulty in the area of oral comprehension may also be attributed to lower performance on the Oral Form as compared to the Extended Time Form. It is also important to note that BR has been at the current school for 5 years and has availed regular and systematic support to address challenges in his learning profile. This too might have contributed

to the improvement in performance in both the Extended Time Form and the Oral Form.

4.7. The Case of Student 2: SS

4.7.1. Early childhood.

SS is a 14-year-old girl. Interaction with SS's mother indicates that there were delays in her speech during childhood. All other areas of early development have been normal. She has been physically active since childhood and has been heavily inclined toward sports and dance.

4.7.2. Family background.

SS lives with her parents and two older siblings. Her father is a doctor and her mother owns a beauty parlour. Her elder sister is currently working and her elder brother is currently pursuing a Diploma in Engineering. SS is reportedly close to her parents as well as both her siblings. Her parents have been supportive of her difficulties and the mother reports that the home atmosphere is relaxed with low pressure on the children in terms of academic performance. There is no reported history of learning disabilities in the family.

4.7.3. Schooling history.

SS completed her early schooling up to Grade 3 in a school under the Central Board of Secondary Education (CBSE). She was consistently performing poorly in her academics. During this period, she was reported to be shy and withdrawn. Her interaction with her classmates is reported to have been low. As a result she was shifted to the current school in Grade 4. SS has completed 8 years of schooling in the present school (Grade 4to2 years of Grade 10). SS reportedly adjusted easily into the

new school. The mother reports that there has been significant improvement in her academic performance with every passing year in the school. The new school has also helped SS with improving her confidence and social skills. She now makes friends easily and is involved in many community activities.

4.7.4. Language fluency.

SS's mother tongue is Hindi. She knows three languages and reports fluency in these languages as follows:

Table 26
Language fluency reported by SS

Language fluency reported by SS			
Language	**Speaking**	**Reading**	**Writing**
English	Fluent	Fluent	Fluent
Hindi	Fluent	Poor	Poor
Kannada	Average	Poor	Poor

4.7.5. Profile of strengths.

She does not show any interest in Linguistic or Analytical-Logical activities. Her strength seems to be with Spatial skills. SS enjoys art and craft. She paints portraits and makes pencil sketches. She is also not very inclined toward Personal skills. She also enjoys sports especially skating and athletics. She also likes dancing and choreography. She often assists her sister in choreography for dance programmes in community events. This implies that she is more oriented toward physical activities in the physical-mechanical area.

SS is keen to pursue courses related to fashion designing or dance choreography after she completes school and build a career in any of these fields.

4.7.6. Diagnosis.

SS's most recent assessment was conducted one year ago when she was 13 years old. The report states her diagnosis as "academic delay owing to dyslexia". The report indicates that she had no difficulties with attention. The same was confirmed by her mother also. Her mother cites reading as the main challenge for her. She was earlier reported to make many mistakes when she read. This was also observed during the researcher's interaction with her in the sessions. In one instance, she read the word *each* as *much* and was unable to read the word *column*. Her assessment report also confirms this stating that her reading lacked in spontaneity and automaticity. Her reading comprehension was described as factual. SS confirms this when she says that she has to often read the text many times in order to understand it. In some cases, she is still not able to understand it after multiple readings and she would then ask someone to explain it to her. This aligns with the assessment report which states that "She was able to give inferential answers only after explanation". Her vocabulary was reported to be below grade level. The report also indicated that she had difficulties in spelling: Her spellings were phonetic. Difficulties in written expression were also reported: Her writing was described as lacking in syntax and structure. SS reports that she knows what to write but does not know how to write it. She says that she sometimes gets ideas to writes stories or songs or poems, but when she tries to write it, she cannot find the words to convey her ideas. Her IQ was reported to be in the average range.

4.7.7. Experience of exams and support received at school.

In the current school, SS receives support in the areas of comprehension, reading, and writing. She received one-to-one support for the first few years after

joining her current school but this was reduced later after she developed more independent learning behaviours.

4.7.8. Learning skills profile.

Table 27 presents the learning skills profile of SS.

Table 27
Learning Skills Profile of SS

Learning Skills Profile of SS					
Attention	**Memory**	**Visual Perception**	**Reception of Spoken Language**	**Reception of Written Language**	**Writing**
0	0	3	0	3	2

Note: 0=no difficulty, 1=mild difficulty, 2=moderate difficulty, 3=severe difficulty, 4=complete difficulty

For SS, difficulties in the severe range are in visual perception and reading comprehension and moderate difficulty in writing.

4.7.9. Performance on the MPT-5.

SS has done better in both the alternate forms, however, she has done better at the oral form of the test. The oral form may have worked better for SS due to her strengths in the areas of attention as well as reception of spoken language. Her performance in both the alternate forms, however, is in the *low* and *very low* category for all 5 subtests when compared to the Comparison Group. She also reports *high* to *very high* difficulty with test-taking for the standardised test and the alternate forms with lowest level of difficulty reported for the oral form.

SS has severe difficulties with visual perception and reading comprehension. Like BR, the Extended Time Form may have benefitted her as it provided more time to read and understand the questions. Her improved performance on the Oral Form as

compared to the Extended Time Form may be due to no difficulty in the area of oral comprehension.

4.7.10. Summary.

SS is a 14-year-old girl with average IQ. Her learning skills profile indicates challenges with visual perception, reading comprehension, and writing. SS has benefitted from the Extended Time Form and the Oral Form of the MPT-5. Like BR, the improvement in performance on the Time Form may be because the extra time helped him to deal with difficulties faced in reading as a result of difficulties with visual perception and reading comprehension. Her performance in the Oral Form ties in with her learning skills profile which shows no difficulty with oral comprehension. This may also be the reason for her better performance in the Oral Form as compared to the Extended Time Form. SS has been at the current school for 8 years and has availed regular and systematic support to address challenges in her learning profile. This too might have contributed to the improvement in performance in both the Extended Time Form and the Oral Form.

4.8. The Case of Student 3: JS

4.8.1. Early childhood.

JS is a 16-year-old boy. He appeared to be shy and maintained low eye contact, often looking down at his hands when he speaks. Interactions with JS's mother indicate that there were delays in his speech. He was consistently a low performer in school.

4.8.2. Family background.

JS's father owns a textile shop and his mother is a housewife. His father is largely uninvolved with his academics which is looked after entirely by his mother. JS's family environment seems to be characterised by low emphasis on academic achievements. His father does not seem to have high academic expectations for him and expects JS to work in the family's textile shop after he completes some basic education. This is reflected in JS's career planning too as he has not explored other educational or career options.

4.8.3. Schooling history.

JS has a history of multiple school shifts. He completed his education from Grade 1 to Grade 3 in a mainstream school under the Council for the Indian School Certificate Examination. Owing to poor academic performance, he was shifted to another school under the same board. JS pursued Grade 4 to 8 in this school. He was made to repeat Grade 8 in this school due to academic underperformance. JS joined the current school from Grade 9. He has completed two years of schooling in the present school (Grade 9 to first year of Grade 10).

4.8.4. Language fluency.

JS's mother tongue is Tamil. He knows three languages and reports fluency in these languages as follows:

Table 28
Language fluency reported by JS

Language fluency reported by JS			
Language	**Speaking**	**Reading**	**Writing**
English	Average	Fluent	Average
Tamil	Fluent	Poor	Poor
Kannada	Fluent	Poor	Poor

4.8.5. Profile of strengths and weaknesses.

JS does not show any interest in Linguistic activities. He reads very rarely and does not like to write. He is also not keen on Analytical-Logical activities. He also likes drawing and working with colours but has not had many opportunities to engage in art activities. Hence, Spatial skills could be a strong area for JS if it is explored further. Personal skills seem to be strong for JS. He has been described to be helpful and often goes out of his way to help people in need. This was also observed during the researcher's interaction with him during a testing session where he offered to play the role of a reader for his friend. He enjoys talking and interacting with people. JS also likes to solve problems. He often helps his father with problems in the day-to-day running of the business and these are often problems related to logistics management and administration. In Physical-Mechanical area, JS enjoys games and physical activities. He is not inclined toward mechanical skills.

4.8.6. Diagnosis.

JS's most recent assessment was conducted two years ago when he was 14 years old. The report states his diagnosis as "learning disability with difficulties in reading, writing and spelling". The report states that JS has impaired attention which aligns

with JS's report that often his "mind goes somewhere". He is easily distracted by ambient noise such as people talking or other loud sounds. JS finds reading to be effortful. He often skips lines when he reads and as a result is unable to understand the meaning of the text. He also makes similar mistakes in his exams. His assessment report also confirms impaired visual perception. JS also reports difficulties with oral comprehension. He often has to clarify instructions or questions two or three times in order to understand it. This was also observed during the researcher's interaction with JS. The researcher often had to repeat or rephrase questions many times in order for JS to understand it. JS also indicates difficulties with writing. He states that he does not like to write because he cannot convert his ideas into words. His answers in exams are often short and do not reflect everything that he knows. The reported IQ was 81 which falls in the low average range.

4.8.7. Experience of exams and support received at school.

JS has been in the current school for only a year and his responses indicate that he is still adjusting to the new teaching environment in his school. JS receives intense one-to-one support in learning. He is not sure about whether he finds the new teaching methods helpful. He reports that he finds exams hard due to his difficulties with writing. In his discussions with friends after exams, he often realizes that he has misunderstood questions and hence his answers are inappropriate.

4.8.8. Learning skills profile.

Table 29 presents the learning skills profile of JS.

Table 29
Learning Skills Profile of JS

Learning Skills Profile of JS					
Attention	**Memory**	**Visual Perception**	**Reception of Spoken Language**	**Reception of Written Language**	**Writing**
2	2	2	3	2	2

Note: 0=no difficulty, 1=mild difficulty, 2=moderate difficulty, 3=severe difficulty, 4=complete difficulty

JS's main area of difficulty is with oral comprehension. However, he also has moderate difficulties in all the other areas.

4.8.9. Performance on the MPT-5.

JS has performed better on the Oral Form of the test. His performance on the Extended Time Form was lower compared to his performance in the oral form. However he reports *low* to *very low* difficulty with test-taking for the standardised test and the alternate forms with lowest level of difficulty reported for the oral form. It is also to be noted that JS's performance in both the alternate forms are in the *low* and *very low* category for all the five subtests when compared to the Comparison Group. JS's lower performance in the Extended Time Form is a departure from the trends found in BR's and SS's improvement in the Extended Time Form considering that like these two students, he also expresses challenges in visual perception and reading comprehension. Two possible explanations are suggested for this. One reason may be moderate difficulty with memory that is expressed in his learning skills profile. This difficulty may have not allowed him to fully benefit from the provision of extra time. The second explanation may be that since oral comprehension is a strong area

of difficulty, remedial intervention at school may have focussed on techniques to help him deal with this challenge and to better utilise the provision of an oral administration format.

4.8.10. Summary.

JS is a 16-year-old boy with a reported IQ that falls in the low average range. His learning skills profile indicates difficulties with attention, visual perception, reading comprehension, oral comprehension, and writing. He is availing one-to-one support in the current school and is acclimatising with the methods in the school after having completed nine years of education in a regular school. He has benefitted more from the Oral Form of the test as compared to the Extended Time Form. Better performance on the Oral Form has been proposed to be as a result of support offered at school to address challenges with oral comprehension.

4.9. The Case of Student 4: RR

4.9.1. Early childhood.

RR is a 15-year-old girl. She appeared to be articulate and expressive. Interactions with RR's parents indicate that there were no delays in her developmental milestones.

4.9.2. Family background.

RR has no siblings. Her father works as the CEO of a reputed institution that offers academic coaching to students. Her mother is a dentist who runs her own clinic. Interactions with RR's family indicate that they do not perceive RR as having any difficulty. They do not acknowledge RR as having a learning disability. They

report her main challenge to be anxiety, especially associated with taking examinations.

4.9.3. Schooling history.

RR pursued her education from Grade 1 to Grade 8 in a reputed mainstream school under the Central Board of Secondary Education. However, as she went to higher grades she reported experiencing increasing pressure to perform well in exams and get good grades. She experienced stress when she was not able to get good grades as compared to her friends. RR's parents seemed to attribute her difficulties with academics to the pressures of the competitive educational system. RR's parents then transferred her to the current school which is under the National Institute of Open Schooling. RR's parents planned that she could pursue up to Grade 10 in a low stress environment after which they would shift her to the State syllabus for Higher Secondary. In the current school, RR shows high confidence. She is performing better than most students in her batch, however, she still reports high anxiety during the time of examinations.

4.9.4. Language fluency.

RR's mother tongue is Telugu. She knows three languages and reports fluency in these languages as follows:

Table 30

Language fluency reported by RR

Language fluency reported by RR			
Language	**Speaking**	**Reading**	**Writing**
English	Fluent	Average	Average
Kannada	Average	Poor	Poor
Sanskrit	Average	Average	Poor

4.9.5. Profile of strengths and weaknesses.

RR is very interested in Linguistic activities. She purchases many books and also likes to write articles and poems. However, interactions with her parents indicate that her abilities in this area may not be strong. She is often unable to complete reading a book as she gets tired. The quality of her writing has also been described to be lacking in content and structure. However, RR seems to think that her writing is "pretty good". In the Analytical-Logical area, RR's parents describe her as a thinker. She holds strong opinions on issues such as women's empowerment and watches videos and subscribes to blogs that have related content. Her father describes her to be logical in her thinking. She is systematic and orderly in her daily activities. She enjoys making timetables and plans. However, she does not like Mathematics. RR seems to be weakest with her Spatial skills. She does not enjoy art or design related activities or physical activities. After answering the aptitude test for Spatial activities, she described her performance to be "pathetic". RR is friendly and interested in people and the Personal talent may be a strength for her. Her parents describe her to be observant, she often notices minor details about people. She is caring and is often the confidant for her friends. However, she also tends to get over involved and emotionally affected by others' problems. RR shows no inclination toward Physical-Mechanical activities. Apart from this, she enjoys music and sings and plays the guitar.

4.9.6. Diagnosis.

RR's most recent assessment was conducted four years ago when she was 11 years old. The report states her diagnosis as "specific difficulties in spelling, written expression and math". The report indicated that her reading was grade appropriate.

RR also reports that she does not experience any difficulties with reading or writing. She reports that she enjoys reading and writing. She feels that writing is her talent area and wishes to pursue a career as a journalist or an editor. RR's IQ is not reported in her assessment report. However from behavioural observations it may be assumed to lie in the average range. It must be noted that there are many inconsistencies in the insights shared by her parents. Her mother reports that though RR purchases many books, and also initiates reading, she rarely completes any book. She is reported to have completed only one book completely. While RR also reports no difficulties with reading comprehension, her mother says that, in exams she can easily get confused with a question if it is framed in a different way. Her parents add that while she does write, the quality of her is "not very good" and that writing "is not her strength". The mother reports that this is due to spelling and grammar difficulties. However, the researcher's observations as well as information from RR's assessment reports indicate that it is highly likely that her poor academic performance is the result of dyslexia rather than mere exam anxiety. RR's parents also indicated that RR experiences severe anxiety before her exams. She plans elaborate timetables but becomes anxious when she is not able to follow them. She keeps going over the same notes over and over or may keep repeating an answer multiple times.

4.9.7. Experience of exams and support received at school.

RR reports that she does not do well in exams due to her anxiety. She states that she often forgets content that she has studied during the exam due to her anxiety. RR does not receive any special support in the school. She sometimes avails one-to-one support from her teachers if a particular chapter or content is difficult for her. However, as per her reports, this happens only rarely.

4.9.8. Learning skills profile.

Table 31 presents the learning skills profile of RR.

Table 31
Learning Skills Profile of RR

Learning Skills Profile of RR					
Attention	**Memory**	**Visual Perception**	**Reception of Spoken Language**	**Reception of Written Language**	**Writing**
0	0	2	0	3	1

Note: 0=no difficulty, 1=mild difficulty, 2=moderate difficulty, 3=severe difficulty, 4=complete difficulty

Analysis of RR's, learning skills profile shows that she could have severe difficulties with reception of written language. Visual perception and writing emerge as moderate and mild levels of difficulty respectively.

4.9.9. Performance on the MPT-5.

While RR has done better in both the alternate forms, she has performed better in the time-concession form. For the time form, her scores in 3 subtests are in *high* to *very high* categories as compared to the Comparison Group. RR also reports very low difficulty with test-taking for the standardised test and the alternate forms with lowest level of difficulty reported for the time-concession form.

RR's improved performance on the Extended Time Form can be explained due to the main challenges in her profile in visual perception and reading comprehension. RR was unable to complete the test in the standardised administration and the extra time in the Extended Time Form helped her complete the test.

4.9.10. Summary.

RR is a 15-year-old girl with no reported delays in developmental milestones. Her learning skills profile indicates difficulties with reading, reading comprehension, and writing. Her higher performance in the Extended Time Form may be due to the extra time that helped her with completion of the test as well as to deal with challenges in visual perception and reading comprehension.

4.10. The Case of Student 5: SAS

4.10.1. Early childhood.

SAS is a 14-year-old girl. Interaction with SAS's parents indicates that there were no delays in her developmental milestones. She had started speaking early. SAS has no siblings.

4.10.2. Family background.

SAS lives with her parents and grandmother. Her father works in the field of investment promotion in a company based in Denmark. Her mother is a housewife. There is no reported history of learning disabilities in the family.

4.10.3. Schooling history.

SAS completed her entire schooling in the current school. SAS has reported to be happy, overall, with her experience of school. Her parents report that there were instances of mild bullying and being isolated during Grades 7-9. However, SAS seems to have dealt with these issues well and she now gets along well with all her classmates.

4.10.4. Language fluency.

SAS's mother tongue is Kannada. She knows four languages and reports fluency in these languages as follows:

Table 32
Language fluency reported by SAS

Language	Speaking	Reading	Writing
English	Fluent	Average	Average
Kannada	Fluent	Average	Average
Hindi	Average	Poor	Poor
Tamil	Poor	Poor	Poor

4.10.5. Profile of strengths.

In the Linguistic area, SAS reports interest in reading. She especially likes to read biographies and books and articles related to sports. She also likes to read about social issues. However, she does not like to write and avoids writing as much as possible. In the Analytical-Logical skills area, SAS likes mathematics. She is systematic and likes to make timetables. However, she seems to struggle with organisation of ideas and this is also reflected in her difficulties with writing. Her father reports that though she is able to cover all points within a topic, logical connections between ideas are weak. The Spatial area is a clear strength for SAS. She has a well-developed sensitivity toward colours and likes working with them. She is sensitive toward fashion and careful about her dressing. SAS is also strongly oriented to Personal activities. Although she is not outgoing, she gets along easily with small children and older adults as compared to her peers. She is interested in learning about people and relationships. She is reported to be helpful to her friends.

In the Physical-Mechanical area, her mother reports that she is good with hand eye coordination and does well at sports, mainly badminton and volleyball. She also closely follows women's sports especially tennis and volleyball. She is interested in music and has trained in Carnatic music for 4 years. She also enjoys baking.

SAS is interested in pursuing careers related to sports. She is also interested in taking up careers where she can work with small children.

4.10.6. Diagnosis.

SAS's most recent assessment was conducted four years ago when she was 10 years old. The report states that she has "mild dyslexia". Her parents report that while her attention fluctuates depending on her interest in the task or content, this has not been a cause for concern in her academics. Her memory has been described as a strength for her. While SAS's parents report that she likes reading, another strength in SAS's profile is her reading comprehension. SAS is able to read and summarise a text accurately. The assessment report also confirms this as an area of strength for her. Her parents report that the remedial classes at school have helped her to improve her reading comprehension skills. A main difficulty for SAS has been in the area of writing. According to SAS as well as her parents, she is not able to adequately transform her thoughts and ideas into words and express herself as well as she would like to. As a result, as per her report, she has developed a dislike toward writing. However, with remedial help, her writing has improved and so has her attitude towards writing. The father reports that her difficulty was also with organisation of her ideas: While she often knows all the points, she is not able to convert it in an organised and logical manner. She also has difficulties with spelling. The legibility

of her written work is also inconsistent. The report states that her general abilities (IQ) are in the superior range.

4.10.7. Experience of exams and support received at school.

In the current school, SAS receives remedial support mainly targeting her difficulties with writing. Her parents report remarkable improvement in the quality of her written work as a result of her remedial classes. She receives extra time at school during exams. While SAS has not been interested in availing this concession, it has been useful for her to complete her answer scripts.

4.10.8. Learning skills profile.

Table 33 presents the learning skills profile of SAS.

Table 33
Learning Skills Profile of SAS

Learning Skills Profile of SAS					
Attention	**Memory**	**Visual Perception**	**Reception of Spoken Language**	**Reception of Written Language**	**Writing**
0	0	1	0	0	2

Note: 0=no difficulty, 1=mild difficulty, 2=moderate difficulty, 3=severe difficulty, 4=complete difficulty

For SAS, the area of writing emerges at the moderate difficulty level on her learning skills profile. She also shows mild difficulties with visual perception.

4.10.9. Performance on the MPT-5.

Since the MPT-5 follows a multiple-choice response format, it does not require the test-taker to write descriptive responses. Hence, difficulty in this area does not seem to have impacted her performance in any of the forms. SAS's strengths are in the areas of visual perception and reading comprehension. She has never availed the

help of a reader. This may explain her better performance in the time-concession form as compared to the oral form. She also avails time-concession for her school exams which has been reported to be helpful for her.

SS's better performance on the Extended Time Form can be explained by two reasons. First, moderate difficulty expressed with visual perception in her learning skills profile may have been addressed with the extra time provided. Second, familiarity with this provision at school may have better equipped her to perform better on the Extended Time Form.

4.10.10. Summary.

SAS is a 14-year-old girl with reported IQ in the superior range. For student SAS, the main area of difficulty seems to be writing. Since the MPT-5 follows a multiple-choice response format, it does not require the test-taker to write descriptive responses. Hence, difficulty in this area does not seem to have impacted her performance in any of the forms. SAS expresses mild difficulty in the area of visual perception. The Extended Time Form may have helped by providing her more time to read and understand questions. She also avails time-concession for her school exams which has been reported to be helpful for her. SAS has never availed the help of a reader at school. This may explain the lack of her improvement with the Oral Form.

4.11. The Case of Student 6: AJS

4.11.1. Early childhood.

AJS is a 15-year-old boy**.** He appeared to be friendly and outspoken. The primary informant for AJS was his paternal aunt, who is also his guardian. His aunt

reports that while his other developmental milestones were normal, onset of speech was late and he started speaking at around the age of 3 years. A previous assessment report (conducted when he was 14.5 years of age) also reports that his developmental milestones were normal. AJS had health complications in his childhood. He had an open heart surgery before 3 years of age. He was reported to often fall ill as an infant. He has been susceptible to upper respiratory tract infections resulting in fever, cough, and cold.

4.11.2. Family background.

His father passed away when he was 11 years old and he is currently looked after by his paternal aunt and uncle. AJS is close to his aunt who has taken keen interest in his education as well as other personal aspects of his life. He is not very close to his mother. Although the details were not available, there seem to have been difficulties in his bonding with his mother. Interactions with his aunt have indicated that there have been instances of physical and verbal abuse in his childhood by his mother, even until recently. Another important caretaker, apart from his aunt, is his paternal grandmother who lives in the ancestral home in another city. AJS often stays with her during his school vacations.

AJS has a younger brother who is 12 years old and his aunt reports that there is high sibling rivalry between the two brothers. The younger brother lives in the ancestral home with their grandmother. While there is no diagnosis of any learning disability, it has been reported that AJS's younger sibling is also academically weak. It is also reported that AJS's father was weak in studies but was described as being "street smart". The same description has been made about AJS also. His aunt reported that he "does not like to open his study books but is smart in many other ways".

4.11.3. Schooling history.

AJS completed his schooling from lower kindergarten to Grade 8 in a school under the Central Board of Secondary Education. AJS was reportedly not performing well academically in his earlier school and had difficulties "fitting in" to the school. He shifted to his current school in Grade 9. He is presently in his third year at this school (Grade 9 and two years of secondary level). He pursued the following subjects in secondary level: economics, home science, English, business studies, and data entry.

4.11.4. Language fluency.

AJS's mother tongue is Gujarati. He knows three languages and reports fluency in these languages as follows:

Table 34
Language fluency reported by AJS

Language fluency reported by AJS			
Language	**Speaking**	**Reading**	**Writing**
English	Average	Average	Average
Hindi	Fluent	Poor	Poor
Gujarati	Fluent	Poor	Poor

4.11.5. Profile of strengths and weaknesses.

Interviews with his aunt and school teachers revealed that tasks related to the Linguistic area are not within AJS's strengths profile. He has difficulties in expressing himself and comprehending what he reads and hence avoids such tasks. Similarly, this student's interests in tasks that draw upon Analytical-Logical skills do not emerge as his strong point. On the other hand, AJS's inclination toward Spatial activities seems to be high. He shows sensitivity to design and colours and often

gives suggestions to his aunt on dressing, accessories, and make-up. He has also been good with crafts such as making paper flowers. He likes to clean the house and keep it neat and organised. AJS's talents in the Personal area also seem to be prominent. He has been described as a "people's person". He is friendly and outgoing. He enjoys organising events and programmes. He has been described to be good with children and elderly people. AJS also likes to fix machines. At home, he has tried fixing the self-igniting gas stove and the calling bell, and gadgets like smart phones. This could indicate Physical-Mechanical talents. At the same time, it must be kept in mind that as per his aunt's report AJS has had limited opportunities for formally exploring many activities such as drawing and sports.

AJS has expressed interest in pursuing a career related to business where he can meet and interact with people.

4.11.6. Diagnosis.

AJS's most recent assessment was conducted when he was 14.5 years old. The report states that a dyslexia screening test indicated the presence of dyslexia. While the report indicates that his attention span was adequate, AJS reports that his mind often "goes to other things" and that he "loses interest quickly". In class, his thoughts often drift, and he reports that when he comes back, "the class is somewhere else". His aunt reports that he is "very distracted". AJS dislikes reading and reports that he makes mistakes when he reads. He reads only when he is required to. He also reports difficulties with reading comprehension. He says it is difficult for him to understand what he reads until he does so "slowly and carefully". His aunt reports that while he used to make a lot of mistakes in reading before, he has improved since he joined the current school and makes fewer mistakes now. However, she maintains that reading

comprehension continues to be a challenge. According to her, AJS faces difficulty in connecting ideas when he reads a text. AJS does not like writing. He only writes for his school work. In his own words, "So many ideas and they keep changing. I can say it but when I have to write it, I'll miss it". His IQ on the WISC was in the average range (90). The report referred him for intensive remediation to address his difficulties with reading and writing.

4.11.7. Experience of exams and support received at school.

AJS reports that he does not like exams because he does not like competing with others. He feels that he does not do well in exams but that he knows more than his friends who score better than him in exams. AJS feels that he cannot do well in exams because he is unable to express his ideas in his answer sheet.

In the current school, AJS receives support in the areas of comprehension, reading, spelling, and writing. For two years, he received one-to-one support at his school. In the third year, he was taken off one-to-one support after the teachers noticed improvement in his learning.

4.11.8. Learning skills profile.

Table 35 presents the learning skills profile of AJS.

Table 35
Learning Skills Profile of AJS

Learning Skills Profile of AJS					
Attention	**Memory**	**Visual Perception**	**Reception of Spoken Language**	**Reception of Written Language**	**Writing**
3	0	2	1	3	3

Note: 0=no difficulty, 1=mild difficulty, 2=moderate difficulty, 3=severe difficulty, 4=complete difficulty

Analysis of AJS's learning skills profile shows that he has severe difficulties in the areas of attention, reception of written language, and writing; moderate difficulty in visual perception; and mild difficulty in reception of spoken language.

4.11.9. Performance on the MPT-5.

Overall, AJS's report of test-taking is in the *high difficulty* category. AJS has not performed well on either of the alternate forms of the test. He discontinued the oral form of the test and expressed extreme difficulty in performing on this version of the test. His performance on the standardised aptitude test is higher than both the alternate forms. However, it is important to note that this performance in the standardised aptitude test is still in the *very low* and *low* category in all the five subtests, as compared to the Comparison Group.

AJS, contrary to the other members of the group has not done well on the alternate forms. Hence, his findings do not follow the trend of the other cases in this study. AJS did not complete the Oral Form of the test as he found it difficult. Other possible explanations for this could come from his educational background. As described above, AJS is currently in his third year at the current school. He is recently out of one-to-one support, may be still learning to independently apply coping skills. These may be possible reasons for him not being able to benefit from the accommodations.

4.11.10. Summary.

AJS is a 15-year old with normal IQ. His learning skills profile indicates widespread difficulties in a number of areas including attention, reading, reading comprehension, and writing. He has performed poorly on the standardised as well as the two alternate versions of the MPT-5. In summary, while AJS subjectively, reports marginal improvement in test-taking ease on the Extended Time Form, his actual

performance does not seem to have been helped by the alternate version of the test. Possible reasons for his lack of improvement in both the alternate forms may be due to the severity of his challenges in multiple areas of his learning skills profile and the relatively shorter time spent at the current school learning skills to cope with these challenges.

The case studies of each of members of the Study Group served to bring an idiographic focus to this research. Through this individual specific examination, the researcher was able to specify the issues surrounding each individual in a more nuanced manner.

4.12. Conclusion

The findings of this study indicate that the performance of the Study Group (students with dyslexia) are at lower levels when compared to the Comparison Group (students without dyslexia) on a standardised administration of career assessment tools. The findings also indicate that the Study Group performs better in the alternate forms, when accommodations are provided in standardised testing procedures. Another important finding is the decrease in the level of difficulty reported by the Study Group with the alternate forms as compared to the standardised administration of the test. The case study reports have also provided detailed descriptions of each student in order to understand the student's context. These descriptions attempted to explain the family and educational background of the student, their strengths and weaknesses on the different areas of the Multiple Potentials Framework, the diagnosis of dyslexia, and their learning skills profile. The learning skills profile has been used to understand how the two forms of accommodations work for the students in the Study Group. Variations in the performances have been explained with the help of

information gathered from the case reports of the students. The next chapter will discuss these findings in the light of the main themes and questions of this research and seek to explain this data against the individualised case study reports of each student in the Study Group. .

Chapter 5

Discussion and Conclusion

The researcher's work as a counselling psychologist in the area of career counselling provided the background for this study. Her work with students with learning disabilities highlighted the challenges in career development experienced by these students. The researcher conducted an earlier study to identify the career development barriers that children with learning disabilities experienced (Aravind et al., 2011). An important finding from the study was the positive effect of self-understanding (knowledge about interests, strengths, and weaknesses) in facing these career development barriers. Based on this initial field experience, the researcher noticed that for some students, awareness of their talents and interests helped them not only to plan for their careers but also brought about an increase in their confidence and well-being.

This research examined the issues that surround the provision of career guidance services for children with dyslexia, from the perspective of creating an assessment system that would bypass the features of dyslexia such that the talents and aptitudes of students with dyslexia could be effectively identified. That the prevalence of dyslexia ranges between 5 and 15 % (APA, 2013) around the world, makes this an urgent question. Yet, very little research has been conducted to inform the discipline on how career guidance can be most effectively provided for this group.

This final chapter examines the findings of this study in the light of trends identified in the literature and draws the findings together to address the research questions raised at the beginning of the study. The chapter also reports the limitations of the study and concludes with recommendations for further research.

5.1. Research Theme 1: Influence of Dyslexia on the Quality of Test Performance

The first objective of this study was to understand whether the presence/absence of dyslexia affected performance when a psychometric aptitude test was administered in a standardised manner. The research questions formulated were:

- *Is there a difference between students without dyslexia and students with dyslexia in the quality of their performance on a standardised, quantitative assessment of aptitudes?*
- *If so, what is the nature of this difference?*
- *How does it affect the process of career counselling for students with dyslexia?*

As described in previous chapters, the performances of a group of six students with dyslexia (Study Group) and 1,200 students with no known history of dyslexia (Comparison Group), on the Multiple Potentials Test-5 (MPT-5) (Arulmani, 2005), a standardised, quantitative measure of aptitude, were examined along two variables: (a) the scores obtained on the MPT-5, and (b) the level of difficulty reported by the student when taking the MPT-5. The findings from the analysis of these two variables are reported next.

5.1.1. Differences between students with and without dyslexia in scores obtained from a standardised administration of the MPT-5.

As described in the previous chapter, the scores obtained on the MPT-5 test of aptitude by the Study Group and the Comparison Group were assessed using two analytic approaches: quartiles and *z* scores. Key findings are discussed below:

Finding 1. All students in the Study Group scored lower on the standardised aptitude test compared to the Comparison Group.

An assumption underlying this study is that the verbal, timed nature of standardised tests may interfere with the test performance of students with dyslexia,

pulling their performance to levels below their peers who do not have dyslexia. The performance of students with dyslexia on such tests may be affected because such tests require the test taker to read and comprehend the test items and response options. It also requires the test taker to do so within a fixed amount of time. The findings of this study confirm this assumption. This study found that, on the whole, students in the Study Group (students with dyslexia) obtained lower scores on the standardised administration of the aptitude test than their peers in the Comparison Group (students without dyslexia) (Table 7). This finding concurs with other studies that have explored the use of standardised career assessment tests with students with learning disabilities (e.g., Enright et al. 1996; Johnstone et al. 2007, Winer et al. 1988). Computation of *z* scores further showed that the Study Group's scores on most of the subtests were 2 or more than 2 standard deviations below the performance of the Comparison Group (Table 9). Difficulties with reading and reading comprehension are common features in all the students in the Study Group, though at different levels of severity. However, as mentioned above, these are foundational skills and essential requirements for the test-taker. Thus, it can be inferred from this finding that the verbal nature of the test along with the requirement of working to a set time limit, could partly contribute to students with dyslexia being unable to perform to the optimal level in such tests.

Finding 2. Students with dyslexia vary in their capacity to perform on the standardised test.

Most students in the Study Group have obtained scores lower than the mean score of the Comparison Group on all subtests (Table 7). However, the extent of this variation differs across students from 1 standard deviation to 3 standard deviations lower than the mean of the Comparison Group (Table 9). It must also be kept in mind

that, one student (Student SAS) has obtained scores that are at the mean (in four subtests) and in one subtest, her score is 1 standard deviation above the mean (Table 9).

It must be noted, therefore, that among students with dyslexia there are differences in their capacity to perform on standardised tests. This may be due to the differences in the levels of severity in their dyslexia profile. It may also be due to differences in their general capacity. While most students (four of six) in the Study Group have average IQ (as indicated by their assessment reports), one student has been reported to have IQ in the low average range, and another student in the superior range.

5.1.2. Differences between students with dyslexia and without dyslexia in the level of difficulty reported in taking the MPT-5.

The research theme, influence of dyslexia on the quality of test performance, was also explored by assessing the subjective experience of difficulty experienced during test-taking. Studies have found that negative experiences with taking examinations in the educational setting often lead to students with dyslexia viewing any assessment method with some extent of apprehension (e.g., Aravind et al., 2011). This subjective experience of test-taking was assessed by administering the Tests and Me Questionnaire (developed specifically for this purpose) immediately after the students had completed the MPT-5. The findings related to this enquiry are as follows:

Finding3. Students in the Study Group varied in the level of difficulty they reported with the standardised aptitude test.

Three students in the Study Group obtained scores in this questionnaire that indicated that they experienced *very high* difficulty with taking the MPT-5 (Table 11),

with two students' scores located two standard deviations below the mean and one student's score at one standard deviation below the mean (Table 12). However, one student reported *low* difficulty and two students reported *very low* difficulty with the MPT-5 (Table 11).

Here again it must be noted that it is possible that while the experience of greater difficulty with test-taking may be common amongst dyslexics, their subjective experience of difficulty may vary from one person to another. This subjective experience could be linked to severity of the dyslexia.

Finding 4. Self-reported difficulty reported by the students in Study Group may not align with their actual performance on the test.

Students JS and RR for example, report *low* and *very low* difficulty with the standardised aptitude test (respectively) (Table 11) although their performance in all the subtests in the *very low* and *low* categories in contrast to the Comparison Group (Table 8). Students AJS, BR and SS whose performance in the standardised aptitude test is also in the *very low* and *low* categories (Table 8), on the other hand, report *very high* difficulty with test-taking (Table 11). Student SAS whose performance in three subtests is in the *low* category and in two subtests is in the *high* category (Table 8) reports *very low* difficulty with test-taking (Table 11).

This finding indicates that students with dyslexia may vary in the degree of insight that they have into their difficulties and its impact on their performance. A possible reason may also be the extent of their exposure to different types of educational environments. Students who have spent more years in schools with formal evaluation systems may be more familiar with standardised testing methods and hence perceive standardised tests to be easier (despite actual low performance) as

compared to students whose tenure in such schools were shorter, resulting in less familiarity with formal evaluation methods.

In summary, the key findings from the administration of the standardised aptitude test to the Study Group and the Comparison Group indicate that, in general, students with dyslexia may be at a disadvantage when taking standardised tests that are verbal and timed in nature. However, this is not applicable to all students with dyslexia. Also, students with dyslexia vary in their perception of difficulty with test-taking. While some students may report difficulty with standardised tests, some may not, even when their performance is poor.

5.2. Research Theme 2: Accommodations and their Impact on Test Performance

Having shown that overall, students with dyslexia tend to perform poorly on standardised administrations of aptitude tests, next, the study investigated the effectiveness of two alternate forms of the MPT-5 with the Study Group. The two alternate forms selected were an Extended Time Form of the test and an Oral Form of the test. These concessions are commonly availed by students with dyslexia in the educational setting during examinations (Central Board of Secondary Education, 2017; Council for the Indian School Certificate Examinations, 2017). The research question formulated was:

- *How do accommodations improve the test performance of students with dyslexia?*

The objective here was to compare the Study Group's performance on the two alternate forms of the MPT-5 to their performance in the standardised administration of the full form MPT-5. Another objective was to compare the relative ease or difficulty reported in taking these alternate forms standardised full form. These

comparisons were made against the performance of the Comparison Group as well as within group comparisons focusing specifically on the Study Group. Findings are reported below.

5.2.1. Differences in the Study Group's performance on the alternate forms of the MPT-5

Finding 5.Most students in the Study Group were able to perform better in the alternate forms as compared to the standardised administration of the MPT-5.

Students BR, JS, RR, SS, and SAS performed better on most subtests of the MPT-5 in either one or both the alternate forms as compared to the standardised aptitude test (Table 13). It must be noted however, that one student (Student AJS) performed better at the standardised aptitude test (four out of five subtests) as compared to the alternate forms (Table 13).

The benefits of such accommodations have been reported in earlier literature as well (e.g., Johnstone et al., 2007, Sireci, Li, & Scarpati, 2006). This finding could indicate that as a first step, providing alternate forms of a given standardised test could help the student with dyslexia perform better.

Finding 6. Variations exist in the type of accommodation that best suits a given student. Improvements in test performance were seen in both or one of the alternate forms in all but one of the students in the Study Group.

Students BR, RR, and SAS performed better with the Extended Time Form and Students JS and SS performed better at the Oral Form (Table 22).

The learning from this finding is that while accommodations are helpful, a single accommodation may not meet the needs of all students with dyslexia.

Finding 7. Although most students performed better in the alternate forms, their performance was still lower than the Comparison Group.

Although the Study Group students' performance in one or both alternate forms improved compared to their performance in the standardised test, this improvement did not bring them on par with the performance of the students in the Comparison Group. Only some students' improved performance in the alternate forms fell into the *high* and *very high* category as compared to the Comparison Group (e.g., Student RR and Student SAS) (Table 15).

Thus, while alternate forms may help students with dyslexia to improve their performance, this performance may still be at a level that is lower compared to their peers who do not have dyslexia.

Finding 8. The alternate forms appear to be easier.

Students who performed better on the alternate forms also reported greater ease with that form (Table 16 & Table 19). However, it is also to be noted that the alternate forms appear to be easier and students reported greater ease with a certain form even though it had not improved their performance. For example, Student AJS reports lower difficulty with the Extended Time Form compared to the standardised aptitude test even though he performed better on the standardised aptitude test in four out of five subtests.

Thus, it is likely that students may perceive an accommodation as being helpful even when it does not help to improve actual performance. This may also be because they are used to availing such benefits in educational settings.

Finding 9. Even when level of difficulty is reported as lower for alternate forms, it may still fall in the high or very high category.

For example, Student BR's Tests and Me scores for both the alternate forms indicated lower subjective experience of difficulty in comparison to his subjective experience of difficulty when he took the standardised aptitude test (Table 16 & Table 19). However, in actual terms, his difficulty level for the alternate forms was still in the *high* to *very high* range. Student SS performed better in the oral form in all five subtests and better in the time concession form in three out of five subtests, however, she reported *high* to *very high* difficulty for both the alternate forms and the standardised aptitude test (Table 16 & Table 19).

This may indicate that while the accommodations have helped to reduce the perception of difficulty, the process of test-taking, in itself is perceived as a difficult experience.

In summary, the key findings from the administration of the alternate forms to the Study Group indicate that, overall, the alternate forms helped the students to improve their performance. Students showed differences in which of the two alternate forms were more helpful. It is also to be noted that while there was improvement in performance, it was still low compared to the performance of students without dyslexia. Similarly, the students also reported lower difficulty with the alternate forms compared to the standardised test. However, for some students, even with decrease in the level of difficulty with alternate forms, the difficulty level was high compared to students without dyslexia.

A question that arises here is the ethical considerations of providing accommodations to students with dyslexia: This has reference to whether the accommodations must be offered in all contexts that avail of standardised testing formats. In the context of career counselling (as opposed to the educational context),

assessment is a one-time opportunity for the career counsellor to identify the aptitudes and potentials of the student. There may not be an opportunity for a career counsellor to see the client with dyslexia again. Recommendations for career choices are based on this one-time assessment. The objective for the career counsellor here is to use the most suitable of method of assessment that will yield reliable results about the student's potentials. Also, in a career counselling system such as the one used in this research (the Jiva approach to career guidance and livelihood), the objective of assessment is not to identify the magnitude of the five potential areas but rather the types of potentials that are high in the student. Such a system relies on scores from a test only to identify the shape of the student's potential profile and not its height.

The use of accommodations is intended to bypass limitations imposed by a disability. Hence, their use may be justified as long as the accommodation does not give an undue advantage to the test taker. A similar example is the concept of *handicap* in golf. The golf handicap is a numerical measure of a golfer's playing ability. The higher the handicap of a player, the poorer the player is relative to those with lower handicaps. This concept was introduced to allow players of different proficiency levels to compete on relatively equal terms. The handicap difference between players is used to determine the number of strokes the high handicap player should receive from the low handicapper during the playing of their round. The idea of accommodations similarly is to create a "level playing ground" for all students in the test-taking process.

5.3. Research Theme 3: Individualised Learning Skills Profile

The final objective of this research was to investigate the effectiveness of the learning skills profile in understanding the Study Group's performance on the

alternate forms. A further objective was to examine how students' learning skills profile could provide information on which alterative form would best suit a given individual. Research questions were formulated as follows:

- *How can an individualised learning skills profile contribute to understanding the student with dyslexia's performance on alternate forms of the MPT-5?*
- *How can an individualised learning skills profile inform the selection of accommodations to ease test-taking and thereby improve the test performance of students with dyslexia?*

The Learning Skills Profile (LSP) Tool was constructed in order to understand the areas of and levels of difficulty experienced by the students with dyslexia. The LSP Tool was based on the International Classification of Functioning, Disability, and Health--Children and Youth version (ICF-CY) and seeks to understand difficulties in six areas: attention, memory, visual perception, reading comprehension, oral comprehension, and writing. The objectives of this tool were to build a learning skills profile of the student and investigate how it can contribute to understanding the performance of the students on the alternate forms of the standardised test. The information required to build the learning skills profile was gathered from multiple sources such as examination of students' assessment reports as well as interview with students and parents.

5.3.1. Using the learning skills profile to understand performance on alternate forms of the MPT-5

As shown in the review of literature, a wide range of factors related to learning characterise dyslexia. The purpose behind the introduction of the learning skills profile into this research was to examine how these underlying difficulties with

learning could influence test performance and whether such information could inform the selection of a suitable accommodation to give the student with dyslexia a better chance of showing his or her abilities in better light.

Finding 10. The learning skills profile throws considerable light on the factors that could affect the dyslexic student's test performance.

For example, students with challenges in visual perception seem to have performed better with the Oral Form of the test (e.g., Students JS and SS). The Oral Form, in this case, may have helped the students to circumvent errors that they are likely to make in reading as a result of their difficulties with visual perception and reading comprehension. On the other hand, students with challenges in attention and reading comprehension may have done better at the Extended Time Form as it provided them more time to understand the questions and to complete answering the test.

Hence, overall the learning skills profile provides insight into the pattern of performance in the alternate forms. Such a profile would allow for a more sensitive approach to addressing the needs of the student with dyslexia.

Finding 11. The sources from which the learning skills profile is constructed influences its accuracy.

The ICF-CY (WHO, 2002) provides a useful framework within which different areas of functioning can be identified according to the objectives of the user (e.g., for assessment, treatment planning, evaluation of treatment etc.) The WHO advocates using multiple sources such as written records, primary respondent, other informants, and direct observation when using the ICF-CY. In this study, the sources that were used to gather information on areas related to the LSP Tool were examination of

previous assessment reports and interviews with the parents and students. While information from some of these sources was detailed and insightful, some information was brief and sketchy. One of the sources of information was students' previous assessment reports. However, as described in the earlier chapter, some reports were brief and gave very little description about the students' level of functioning. Also, the reports varied in terms of domains that were assessed or reported (for e.g., while some reports evaluated and presented the domain of attention, others did not). The other main source of information was interviews with students and parents. Here, the experience of the researcher was that the reliability of the information could be influenced by the insight students had into their difficulties and parents' insight into the challenges experienced by the students. Parents' willingness to reveal the difficulties their children faced also influenced the quality of information that could be elicited. However, since multiple sources of information were referred to, discrepancies could be identified.

Thus a key finding with regard to the LSP Tool is that validity of the information that this tool can elicit, depends on the nature, validity and reliability of the sources of information available. It is also important to collect information from multiple sources and to ensure that self-report (as well as parent-report) is balanced with external documents.

5.3.2. Using and individualised learning skills profile to inform the selection of the most suitable accommodation for a given student

The final objective of this research is to facilitate effective career guidance for the student with dyslexia. It is unlikely that a career guidance practitioner would be trained in skills to diagnose dyslexia and independently select a method of

administering a psychometric aptitude test best suited to the needs of a given person with dyslexia. Therefore this research experimented with the development of a simple tool that would that might help a career guidance practitioner make decisions regarding assessing a student with dyslexia. The findings of this effort are now reported.

Finding 12. Specific features in an individual's history could alert the career guidance practitioner to the presence of dyslexia.

Before a career guidance practitioner makes a decision about administering an alternate form of a psychometric device, he or she first needs to know whether such an accommodation is required at all. Four common patterns are seen amongst all students in this study who were diagnosed with dyslexia: (a) long term difficulties with reading and spelling, (b). repeated school change as a result of poor academic performance, (c). ongoing difficulties with paying sufficient attention to academic tasks, and (d). delay in starting to speak. These features have also been reported in the literature by studies describing the features of dyslexia (e.g., Nag & Snowling, 2012; Thambirajah & Ramanujan, 2016).

Checking for the presence of such features in someone who comes in for career guidance could alert the career guidance practitioner to presence of dyslexia, based on which the next step of administering the Learning Skills Profile Tool could be made.

Finding 13. Multiple factors are involved in the selection of the most suitable accommodation for a given student with dyslexia.

This research aimed at developing a system whereby information from the Learning Skills Profile Tool would guide the career guidance practitioner as to which

accommodation would best suit a given student with dyslexia. Table 36 shows the learning skills profile of each student in the Study Group.

Table 36

An Overview of the learning skills profile of the students in the Study Group

Student	**Learning Skills Profile**				**Best suited Alternate Form**	**Possible explanations for performance on the alternate forms**
	Severe difficulty	**Moderate difficulty**	**Mild difficulty**	**Strengths**		
BR	Attention, Reading Comprehension	Visual Perception, Writing	Memory, Oral comprehension	Memory, Oral comprehension (relative to other areas on the LSP)	Both but better at Extended Time Form	Severe difficulties with attention and reading. Hence, may have been helped by time concession. .
SS	Visual Perception and Reading Comprehension	Writing		Attention, Memory, Oral comprehension	Oral Form	Severe difficulty with visual perception and reading. Hence Oral Form may have helped.
JS	Oral comprehension, Visual Perception, and Comprehension	Attention, Memory, Reading Comprehension		Nil	Oral Form	Extended time form may be more difficult because of difficulties with visual perception and reading comprehension.
RR	Visual Perception, Reading Comprehension,	Writing	Attention	Memory, Oral comprehension	Extended Time Form	Was unable to complete the test in the standardised administration and the extra time here helped her complete the test. Severe difficulty with reading comprehension and moderate difficulty with writing. Hence time concession may have helped.
SAS	Nil	Writing	Visual Perception		Extended Time Form	Moderate difficulty with reading. Hence time concession may have helped.
AJS	Attention, Reading Comprehension, Writing	Visual Perception	Oral comprehension	Memory	Neither	This is his third year in the current school. He is only recently out of one-to-one support, may be still learning to independently apply coping skills.

Other possible factors affecting the performance on the alternate forms:

- *The nature of the aptitude being assessed*: For example, almost all students have done better on the Oral and Extended Time Form, on the Linguistic and Analytical-Logical subtests. The performance of four of six students on the Oral Form of the Spatial subtest is lower than on the standardised form possibly because the items of this subtest are less suited for oral administration.
- *Perceived need for the accommodation*: The Extended Time Form may seem to be less of a "special accommodation" than the Oral Form because the Oral Form involves taking the help of another person. Students who are familiar/comfortable with the provision of extended time may benefit from it more when compared to those who are relatively less exposed to it. Examples are BR and SS who have been in the alternative school for 5 and 8 years respectively compared to other students who have been there for 2-3 years. An exception to this is JS who has been at the school for 2 years but did better at the Oral Form.
- *Experience and Exposure*: Since these are Grade 10 students, they may have acquired coping skills over time that have helped them to benefit from any accommodation to some extent. Lack of opportunities or exposure to day-to-day life routines and experiences could also affect test-taking. This could be a possible explanation for scores that have improved but are still low as against the Comparison Group.

It seems, therefore, that while the learning skills profile is generally helpful in understanding influences on the test-taking process, the outcomes from this research show mixed trends. As seen in Table 36 a definite pattern has not emerged from this research based on which the learning skills profile could support a career guidance practitioners decision making with regard to selection of type of accommodation.

What has emerged, however, is that a learning skills profile is helpful and that there are definite indicators of potential influences on test-taking. Future research could further explore these indicators and bring us closer to linking information from a learning skills profile to the type of accommodation best suited for a given student.

5.4. New Findings and Solutions Identified from this Research

1. Researchers have mostly focused on investigating the application of accommodations in educational assessments. This study presents the importance of considering the type of accommodations that would be most suitable in the process of psychometric evaluation of aptitudes for career counselling.
2. The study has provided some insights into understanding what type of accommodation can benefit the student based on information that can be gathered from a simple, ready-to-use tool (learning skills profile tool). The learning skills profile tool is a ready-to-use tool that career counsellors can be trained to use. The study shows that information gathered from the tool on the nature and severity of the learning skills profile can point the career counsellor to how accommodations can be planned in the test-taking process.

3. Another finding from the study is that students with dyslexia vary greatly in their "dyslexia profile". They also vary in terms of their attitudes toward test-taking and the skills that they have acquired to cope with the test-taking process. Hence, it is difficult to create a one-fits-all formula. Working with students with dyslexia for career counselling would require the counsellor to work with each student individually to understand their nature of their dyslexia profile using tools such as the Learning Skills Profile Tool to evaluate how they can be assessed.

5.5. Applicability of Findings from this Study

1. Within disability sector: This study has used the ICF-CY framework to create a tool that assesses function in areas specific to children with dyslexia. The purpose of this assessment was to evaluate what type of accommodations can be beneficial for the student in the test-taking process. The same framework can be used for other types of disabilities. For example, a learning skills profile can be developed for students with intellectual impairment or visual impairment in order to understand what functioning areas affect their performance on a particular type of test. Difficulties in visual processing will influence a person's ability to perform on a standardised paper-pencil test but not in an orally administered test. Thus the applicability of the ICF-CY as a framework to explore functions that affect test-taking in different formats can be explored.
2. External to the disability sector: This study explored difficulties with mental functions related to language as an impediment in taking standardised tests. However, difficulties with language can also be caused due to other factors like poor schooling, low proficiency with a particular language and so on. Standardised psychometric tests are used based on the assumption that the test-taker has the required level of language proficiency to engage with the test. In situations where the assessor may not be confident of the test taker's ability to perform on the test due to a language barrier, the Learning Skills Profile Tool can be used to assess how an existing test could be accommodated to better suit the learning skills profile of the individual.

   There is also increasing awareness about students who experience problem with reading but do not meet all criteria for the diagnosis of dyslexia (Elliott, 2005). The Learning Skills Profile Tool can be used to assess areas of challenged with

students like these who do not have a clear diagnosis of dyslexia but struggle with tasks related to reading.

3. Across different age groups: While the subjects in this study are between the Class 9 to 11 age group, the same principles of assessment can be applied across age groups. A higher age group, for example, students in graduation may show different learning skills profile due to skills that they have acquired during the educational process. However, further research is required to investigate this possibility and to identify other factors that influence test-taking amongst older age groups.

5.6. Limitations of this research

The limitations of this research are reported below:

1. Sample Recruitment: The main challenge encountered in this study related to obtaining the necessary sample. For the Comparison Group, many schools that were approached cited time pressure as the main reason for non-participation. Hence, the researcher had to resort to convenience sampling. The schools that were part of the Comparison Group sample also varied in the extent of time that was given for participation in the research. One of the tools of the study, the Tests and Me questionnaire, for example, was administered only to Cohort 7 in the Comparison group due to this reason.
2. Sample size: The sample for children with dyslexia in this research comprised of six students. Recruitment of children for this group was challenging due to two reasons (a) lack of willingness of centres catering to children with special needs to participate the in the study, and (b) selecting children who satisfied all the criteria for this sample. Hence, while the study gives useful insights into the test-taking behaviour of children with dyslexia, these results cannot be generalised to

all children with dyslexia. However, it may also be noted that having taken a case study approach this study does not aim to generalise the findings to all children with dyslexia (statistical generalisation). The aim is rather to generate ideas that can contribute to the theory regarding test-taking behaviour of children with dyslexia (analytic generalisation).

3. Diagnosis of the Study Group. This study has relied on the psychologist's report to confirm the presence of dyslexia in the study group. However, there are no standard tools for assessment of dyslexia in the country. Hence, while dyslexia itself has been diagnosed with reasonable reliability, the reporting of specific features and severity level characterising a given student can vary across psychologists.

5.7. General Recommendations

The following recommendations are made based on the findings of this study:

5.7.1. Awareness and sensitisation of career guidance practitioners to the needs of students with dyslexia.

The bulk of career guidance services in this country have focused on career guidance services for the mainstream population. Hence, even among career practitioners there is very low awareness about the career development needs and challenges of students with dyslexia. Students with dyslexia tend to experience more confusion and perceive more barriers with regard to career development (Aravind et al., 2011; Yanchak, Lease, & Strauser, 2005). Anxiety about poor academic record and competing with students without learning disabilities, low confidence levels, and lack of awareness of others about special needs are barriers experienced by children with dyslexia. Hence, an important recommendation is for career guidance

practitioners to become more aware about the unique career development needs and challenges of students with dyslexia. This could be accomplished by including the topic of special needs in career guidance training programmes.

5.7.2. Capacity building for the delivery of career guidance services for students with dyslexia.

There is also a dearth of career guidance services for students with dyslexia. As seen in the review of literature, most career guidance programmes focus on the needs of the "mainstream" population – students with no disabilities. As an outcome of policies related to inclusive education, it is more and more likely that we find students with learning disabilities in mainstream schools and classrooms. Therefore, it is important for the career counsellor to know how to offer career guidance services for children with learning disabilities. Recognising that the promotion of self-understanding is an integral component of the career guidance process, this research provides some starting points for a career counsellor's work with students with learning disabilities. An important task for the career counsellor would be to understand the background of the student's learning problems and to estimate how much this can impact his or her performance on any standardised career assessment tool. At the end of this research, the researcher proposes a tool in draft form that can be applied to understand the chances that a student has of underperforming on a standardised tool as a result of learning disability (Appendix 11). This screening tool can collect information about some of the indicators of dyslexia that could also affect test-taking behaviours such as history of speech delay in childhood, persistent and long term difficulties with reading or spelling, difficulty with paying attention to academic tasks, and history of school shifts due to academic difficulties. Information from this brief screening tool can inform the career guidance practitioner whether a

more detailed learning skills profile is required. This research also provides the interested career guidance practitioner with the Learning Skills Profile Tool (Appendix 5). Based on information from the screening tool, the Learning Skills Profile Tool, can be used to gather information about the areas of difficulty and the level of its severity. The information gathered from the screening tool and the LSP Tool can then be used by the career counsellor to decide if and how standardised assessments can be used with the student.

5.7.3. Working with parents and teachers.

Involving parents and teachers in the career guidance process becomes very important when working with children with dyslexia. The interactions between the career counsellor and the parents and teachers of children with dyslexia should have a two-fold outcome.

Firstly, parents and teacher can become important contributors to the process of career guidance to gather holistic information pertaining to the student. Parents' inputs on the history of the child in terms of the developmental milestones, identification of the problem, educational background, interventions that were applied and its effectiveness, can provide useful insights for the career counsellor to understand the difficulties of the student. Similarly, teachers can become important sources of information regarding how the student copes with educational demands and social and emotional adjustment in the school setting.

The second purpose of interaction between the career counsellor and the parents is to educate the parents about their role in the career development of the student. Parents of children are often in need of guidance with regard to educational pathways that are most effective for their children. The career counsellor can guide parents with regard to the impact of the learning disability on the student's ability to take up

different types of courses (for e.g., courses that are theoretical in nature may not be effective for some students with dyslexia) and their suitability for different types of careers. This may also be an opportunity for the career counsellor to address parents' beliefs regarding career or educational choices that are deemed to be unconventional and hence, not often considered by parents for their children. Similarly, career counsellors can work with teachers to understand the student's interests and talents related to different subjects and help students to select subjects that can lead them toward effective career choices.

5.8. Recommendations for future research

This study has contributed to understanding how the test performance of students with dyslexia, could be improved through alternate ways of administering career assessment tests and in identifying factors that can influence the students' performance on the alternate forms. However, as described above, the study also faced some limitations. It is certain that there is more scope to pursue further research with regard to career assessment and career guidance for children with dyslexia. Some ideas for future research in the field can be as follows:

1. As described in the recommendation above, career assessment is only one component of the career guidance process. Research is required in the other components of the career guidance process such as studying the impact of dyslexia on suitability for different career options, career preparation skills for students with dyslexia, and so on.
2. Future research could use the information gleaned through the case study approach in this research to mount empirical studies on the nature of accommodations and its impact on test-taking. Studies with larger sample sizes can help to generate more empirical evidence about the impact of accommodations on test-taking.

3. Investigating other profiles of dyslexia. With six students as part of the sample, this study may not have covered the different profiles of difficulties that students with dyslexia exhibit. Future research could examine a wider range of profiles.
4. In addition to disability, belonging to lower socioeconomic groups may add further disadvantage. Students from lower socioeconomic groups vary from students from middle and higher socioeconomic groups in terms of the manifestation of dyslexia as well as in their career development challenges and needs. Further research is required to study career development of children with dyslexia from lower socioeconomic groups.
5. Gender has not emerged as a differentiating factor in this research. However, the literature strongly indicates that boys are more likely to be affected by dyslexia than girls (APA, 2013). Future research could focus on the disadvantage that boys with dyslexia face in relation to their female peers.

5.9. Conclusion

The results of this study show first that children with dyslexia are disadvantaged when they are required to face standardised administrations of aptitude tests. It then indicates how accommodations in the test-taking process help students to improve their performance as well as experience greater ease with the test-taking process. The study has also demonstrated how constructing a learning skills profile can provide insights into the effectiveness of the alternate forms with students with dyslexia. An important finding from the study is the identification of other factors that can also influence the test-taking process.

Students with special needs are a much neglected target group in the career guidance literature. Existing research points to benefits of career guidance initiatives for career development and overall well-being of students with disabilities. This

research originated from the researcher's interest to provide these benefits to students with dyslexia. However, much more remains to be done in terms of research and implementation in order to reach these services to the students.

This research has outlined the contours of the issues and challenges that surround the assessment of children with dyslexia for career guidance. In the future, the researcher intends to continue to fine tune the initial pointers obtained through this study. This research lays early foundations upon which other researchers in the fields of career guidance and dyslexia could build, aiming ultimately at developing systems that would allow the student with dyslexia to show his/her talents in the best light.

Appendix 1

Sample Questions from the Multiple Potentials–5 Test

1.Pick the correct pair of words to fill in the blanks:

_____ is to river as _____ is to sea.

a. pond, lake
b. pebble, sand
c. bank, shore
d. boat, catamaran

2. Read this sentence:

"It was a dark and stormy sky."

If you were writing a poem, which one of the following sentences would you choose to go with the given sentence?

a. And the old man walked down the road.
b. And the baby began to cry.
c. And babies were all crying.
d. The doggy ran joyfully into the house

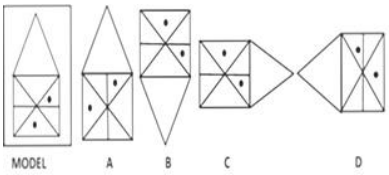
3.If RUST = 9687, then ZXWV = ?

a. 1239
b. 4321
c. 1345
d.2314

4. Pink roses do not have any thorns. All red roses have thorns. About 50% to 60% of yellow roses have thorns. Therefore which of the following is true?

a. 50% of all roses have thorns.
b. 25% of all roses have thorns.
c. None of these.
d. a blind person would be able to find pink roses by feeling the stem of the plant.

5. Which one of the options given below is a rotation of the model?



6.Imagine a cow. Are the cow's hooves split in the middle?

a. Yes.
b. No.
c. It depends on the breed.
d. It splits in the summer.

7. Sujatha is the captain of the basketball team. The best way to build a winning team would be for her to:

a. Develop what each player is good at.
b. Ensure the team practises daily for at least 5 hours.
c. Clearly explain to the team, what she expects of them.
d. Reward players with gifts for good performance.

8. When your friends run into a problem, they:

a. seek your help quite often.
b. seek your help rarely.
c. never seek your help.
d. seek your help if you are around.

9. You are using an electric hair drier and feel a shock. You should immediately:

a. Stand on a piece of wood.
b. Grab a piece of metal
c. Turn off the switch of the hair drier.
d. Pull out the plug from the socket

10. Sports:

a. You are on none of your school/college sports teams.
b. You avoid sports.
c. You are on at least one sports team at school/college.
d. you try but are never able to make it to the team.

Appendix 2

Test and Me Questionnaire

Tests and Me

Tests are a part of our lives. Sometimes I used to feel like this about taking an exam. My research is about how to make test taking easier for students.

You have just taken some of my long tests! I would like to ask you about how comfortable it was for you to take the tests. I have given some statements below. Please indicate how much you agree with the statements. These statements are not related to how you answered the questions in the test and whether you found them easy or difficult. These statements are regarding:

- Length of the test
- Difficultyof language used
- The way you had to give your answers
- Time given to complete the test

Indicate your answer by putting a tick in ONE of the boxes below each statement.

1. As the test went on, I found it more and more hard to give the test my full attention.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

2. I would not want to do this test again because I did not find it useful.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

3. As the test went on, I found it difficult to remember the test instructions.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

4. I had to read the questions more than once to answer them.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

5. I was anxious when I was answering the test.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

6. I found it difficult to read the questions on the test.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

7. I had difficulty understanding the meaning of the questions in the test.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

8. I could have done better if the questions were written in a simpler way.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

9. I experienced pain in my hand or other discomfort when writing the test.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

10. There were many difficult words in the test that I did not know the meaning of.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

11. I was distracted by other thoughts more than once when answering the test.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

12. I am not keen on knowing the results of this test.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

13. I was nervous about answering all the questions within time.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

14. The print of the test not was easy to read.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

15. The questions in the test were too long.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

16. The options for responses were confusing.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

17. The time to answer the test was not sufficient.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

18. I would have been able to do better if the test had pictures.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

19. I would have been able to do better if the questions were read out to me.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

20. I have difficulties with other kinds of tests (e.g., school tests) also.

Strongly agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree

Appendix 3

Multiple Potentials Parent Questionnaire (MPPQ)

Your Child's Hobbies and Achievements

Dear Parent,

Thank you for your participation in this study. One of the aims of this study is to identify your child's interests and talents. Your child's hobbies and achievements can tell us a lot about his/her interests and talents. This questionnaire is to help you share your child's hobbies and achievements. Hobbies are activities that your child enjoys and engages in when he/she has leisure time. Achievements are activities where your child has displayed a talent or ability and has achieved some success.

How to fill in this form:

- You child may have hobbies and achievements in different types of activities. Given below is a description of five areas in which your child can have hobbies and achievements.
- Think back over the years to how your child grew up. What were his/her interests? What were the activities that he/she has a natural liking toward? Don't limit yourself to only your child's performance in school subjects and marks.
- Read the description of each area given below very carefully. In the next, column, write down the hobbies and achievements that your child has had in each of these areas. Please describe these activities in as much detail as possible.

Please enter your child's NAME here:	
Description of areas	**achievements**
The Linguistic Area This area reflects fluency of language and the skill to use words and expressions and effectively. Activities in this area would require sensitivity to the meanings of words, and the skill of using words to communicate effectively and attractively. *Examples of activities*: reading books , magazines or newspaper; writing poems, essays or stories; writing a diary; playing word games like crosswords or scrabbles; participating in competitions like debating, elocution, pick and speak, essay or poem writing	
The Analytical-Logical Area This area is linked to the desire to use	

reasoning skills and apply logic. Those with high skills in this area would enjoy calculations, analysis and planning. They would understand and be able to use logic to solve problems of different sorts. *Examples of activities*: solving mathematical problems, planning and organising functions at home or school, playing number related games like Sudoku or similar puzzles, participating in Math or Science competitions or quizzes, planning resources such as time or money	
The Spatial Area This area reflects the person's orientation to visualizing and transforming observations into concrete realities. Activities in this area require ability to imagine and convert ideas into drawings, designs, products and hand craft. *Examples of activities:* drawing, painting, craft, making models of things, decorating rooms at home, making greeting cards, coordinating clothes and jewellery or accessories.	
The Personal Area Activities related to this area reflect the person's interest in understanding others. These are activities linked to working with people, helping them with their difficulties and promoting their well being. People with skills in this area would understand the moods and feelings of others. *Examples of activities:* taking up leadership roles such as prefect, captain, leader;volunteering with charitable organisations; helping friends with academic or personal difficulties	
The Physical-Mechanical Potential Activities related to this area reflect the person's interest in machines and equipment. Children with interest in this area are interested in understanding how machines work. They would easily put together all the different pieces	

of a new product that has been bought for the home. They would also be able to understand why a machine does not work and would be able to suggest ways to repair a machine. This area is also linked to the motions and expressions of the body as expressed through sport, dance and drama. *Examples of activities:* Sports; physical activities like trekking or cycling; working with machines to explore or repair them; working with tools like screwdrivers, pliers, and hammers; dance	

Appendix 4:

Learning Skills Profile Tool

Development of a Learning Skills Profile Tool

Based on the International Classification of Functioning, Disability and Health-Children and Youth Version (ICF-CY)

Background:

An important component of most forms of career counseling is career assessment. Career assessment employs various tests to assess interests, abilities and strengths of the person for the purpose of guiding individuals to careers that are best suited for them. The tests that are generally used are verbal in format. Typically, such tests are to be administered in standardised formats and scores are interpreted according to normative samples.

Children with dyslexia experience difficulties with language (e.g., reading comprehension) and cognitive functions (e.g., attention). The nature and severity of these difficulties can vary from one child to another. Due to their verbal nature, standardised tests can pose significant limitations in their relevance to children with dyslexia.

Furthermore, such tests tend to highlight the weaknesses rather than the strengths of children with dyslexia. As a result, career counselling that does not have suitable tools could fail to meet the needs of children with dyslexia.

My study will be executed as follows:

1. I am developing a Learning Skills Profile (LSP) that will allow a career counsellor to understand the child from the view point of his/her strengths rather than weaknesses.

2. Based on information obtained from the LSP, I will develop alternate forms of assessing interests and aptitudes that would align with the child's learning strengths, rather than tap into his/her weaknesses.

The purpose of this exercise is to develop a tool that will help to analyse an individual's strengths and weaknesses in learning that arise as a result of dyslexia. This profile will be referred to as a *learning skills profile*. Given below is a list of functions and activities that have been adapted from the International Classification of Functioning, Disability and Health-Children and Youth Version (ICF-CY) developed by the World Health Organization (WHO, 2002). Kindly go through the list and rate how closely each function/activity is linked to the *capacity of a child with dyslexia to take a standardised verbal test*.

For the purpose of this study, a verbal test is described as having the following characteristics:

- Has content that is verbal in nature, that is, requires the test taker to read and comprehend meanings of words and sentences and understand structure of sentences
- Requires test taker to write responses in words or sentences OR to choose a response from a given set of options
- May be speeded, that is, will assess ability based on the rate at which the test taker completes items

Your inputs would be used to develop a simple and easy-to-use instrument that could be integrated into the career counsellor's intake methodology. The career counsellor would use the Learning Skills Profile Tool to understand the strengths of the child with dyslexia and use this information to administer career guidance related instruments in a manner that would tap into the strengths rather than weaknesses of the child with dyslexia.

Rating scale: **1: Not related at all** **2: Mildly related** **3: Moderately related** **4: Closely related**

Function	**Description**	**Rating**
Attention functions: Specific mental functions of focusing on an external stimulus or internal experience for the required period of time		
Sustaining attention	Mental functions that produce concentration for the period of time required	
Shifting attention	Mental functions that permit refocusing concentration from one stimulus to another	
Dividing attention	Mental functions that permit focusing on two or more stimuli at the same time.	
Sharing attention	Mental functions that permit focusing on the same stimulus by two or more people, such as a child and a caregiver both focusing on a toy.	
Memory functions: Specific mental functions of registering and storing information and retrieving it as needed		
Short term memory	Mental functions that produce a temporary, disruptable memory store of around 30 seconds duration from which information is lost if not consolidated into long-term memory.	
Long term memory	Mental functions that produce a memory system permitting the long-term storage of information from short-term memory and both autobiographical memory for past events and semantic memory for language and facts.	
Retrieval of memory	Specific mental functions of recalling information stored in long-term memory and bringing it into awareness.	
Psychomotor functions: Specific mental functions of control over both motor and psychological events at the body level		
Psychomotor control	Mental functions that regulate the speed of behaviour or response time that involves both motor and psychological components, such as in disruption of control producing psychomotor retardation (moving and speaking slowly; decrease in gesturing and spontaneity) or psychomotor excitement (excessive behavioural and cognitive activity, usually nonproductive and often in response to inner tension as in toe-tapping, hand-wringing, agitation, or restlessness.)	
Quality of psychomotor functions	Mental functions that produce nonverbal behaviour in the proper sequence and character of its subcomponents, such as hand and eye coordination, or gait.	

Organization of psychomotor functions	Mental functions that produce complex goal directed sequences of movement.	
Manual dominance	Development and preference in hand use.	
Lateral dominance	Development and preference of eye, and limb use.	
Emotional functions: Specific mental functions related to the feeling and affective components of the processes of the mind		
Appropriateness of emotion	Mental functions that produce congruence of feeling or affect with the situation, such as happiness at receiving good news.	
Regulation of emotion	Mental functions that control the experience and display of affect.	
Range of emotion	Mental functions that produce the spectrum of experience of arousal of affect or feelings such as love, hate, anxiousness, sorrow, joy, fear and anger.	

Rating scale: **1: Not related at all** **2: Mildly related** **3: Moderately related** **4: Closely related**

Function	**Description**	**Rating**
Perceptual functions: Specific mental functions of recognizing and interpreting sensory stimuli		
Auditory perception	Mental functions involved in discriminating sounds, tones, pitches and other acoustic stimuli.	
Visual perception	Mental functions involved in discriminating shape, size, colour and other ocular stimuli.	
Olfactory perception	Mental functions involved in distinguishing differences in smells.	
Gustatory perception	Mental functions involved in distinguishing differences in tastes, such as sweet, sour, salty and bitter stimuli, detected by the tongue.	
Tactile perception	Mental functions involved in distinguishing differences in texture, such as rough or smooth stimuli, detected by touch	

Visuospatial perception	Mental function involved in distinguishing by sight the relative position of objects in the environment or in relation to oneself	
Basic cognitive functions	Mental functions involved in acquisition of knowledge about objects, events and experiences; and the organization and application of that knowledge in tasks requiring mental activity	
Higher-level cognitive functions: Specific mental functions especially dependent on the frontal lobes of the brain, including complex goal-directed behaviours such as decision-making, abstract thinking, planning and carrying out plans, mental flexibility, and deciding which behaviours are appropriate under what circumstances; often called executive functions		
Abstraction	Mental functions of creating general ideas, qualities or characteristics out of, and distinct from, concrete realities, specific objects or actual instances.	
Organization and planning	Mental functions of coordinating parts into a whole, of systematizing; the mental function involved in developing a method of proceeding or acting.	
Time management	Mental functions of ordering events in chronological sequence, allocating amounts of time to events and activities.	
Cognitive flexibility	Mental functions of changing strategies, or shifting mental sets, especially as involved in problem-solving.	
Insight	Mental functions of awareness and understanding of oneself and one's behaviour.	
Judgement	Mental functions involved in discriminating between and evaluating different options, such as those involved in forming an opinion.	
Problem solving	Mental functions of identifying, analysing and integrating incongruent or conflicting information into a solution.	
Reception of language: Specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning.		
Reception of spoken language	Mental functions of decoding spoken messages to obtain their meaning.	
Reception of written language	Mental functions of decoding written messages to obtain their meaning.	

Reception of sign language	Mental functions of decoding messages in languages that use signs made by hands and other movements, in order to obtain their meaning.	
Reception of gestural language	Mental functions of decoding messages in non-formalized gestures made by hands and other movements in order to obtain their meaning.	

Rating scale: **1: Not related at all** **2: Mildly related** **3: Moderately related** **4: Closely related**

Function	**Description**	**Rating**
Expression of language: Specific mental functions necessary to produce meaningful messages in spoken, written, signed or other forms of language		
Expression of spoken language	Mental functions necessary to produce meaningful spoken messages.	
Expression of written language	Mental functions necessary to produce meaningful written messages.	
Expression of sign language	Mental functions necessary to produce meaningful messages in languages that use signs made by hands and other movements.	
Expression of gestural language	Mental functions necessary to produce messages in non-formalized gestures made by hands and other movements.	
Integrative functions of language	Mental functions that organize semantic and symbolic meaning, grammatical structure and ideas for the production of messages in spoken, written or other forms of language.	
Calculation functions: Specific mental functions of determination, approximation and manipulation of mathematical symbols and processes		
Simple calculation	Mental functions of computing with numbers, such as addition, subtraction, multiplication and division.	
Complex calculation	Mental functions of translating word problems into arithmetic procedures, translating mathematical formulas into arithmetic procedures, and other complex manipulations involving numbers.	
Mental function of	Specific mental functions of sequencing and coordinating complex, purposeful movements	

sequencing complex movements		
Watching	Using the sense of seeing intentionally to experience visual stimuli, such as visually tracking an object, watching persons, looking at a sporting event, person, or children playing.	
Listening	Using the sense of hearing intentionally to experience auditory stimuli, such as listening to a radio, the human voice, to music, a lecture, or to a story told.	
Copying	Imitating or mimicking as a basic component of learning, such as copying, repeating a facial expression, a gesture, a sound or the letters of an alphabet.	
Learning through actions with objects: Learning through simple actions on a single object, two or more objects, symbolic and pretend play, such as in hitting an object, banging blocks and playing with dolls or cars.		
Learning through simple actions with a single object	Simple actions on a single object or toy by manipulating, banging, moving, dropping, etc.	
Learning through actions by relating two or more objects	Simple actions relating two or more objects, toys or other materials without regard for the specific features of the objects, toys or materials.	
Learning through actions by relating two or more objects with regard to specific features	Actions relating two or more objects, toys or materials with regard to specific features, e.g. lid on box, cup on saucer.	
Learning through symbolic play	Actions relating objects, toys or materials symbolically, such as feeding or dressing for a toy animal or doll.	

Rating scale: **1: Not related at all** **2: Mildly related** **3: Moderately related** **4: Closely related**

Function	**Description**	**Rating**
Learning through pretend play	Actions involving pretence, substituting a novel object, body part or body movement to enact a situation or event, such as pretending that a block of wood is a car, pretending that a rolled up cloth is a	

	doll.	
Acquiring information	Obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names.	
Acquiring language: Developing the competence to represent persons, objects, events and feelings through words, symbols, phrases and sentences.		
Acquiring single words or meaningful symbols	Learning words or meaningful symbols, such as graphic or manual signs or symbols.	
Combining words into phrases	Learning to combine words into phrases.	
Acquiring syntax	Learning to produce appropriately constructed sentences or set of sentences.	
Acquiring additional language	Developing the competence to represent persons, objects, events, feelings through words, symbols, phrases and sentences, such as in an additional language or signing.	
Rehearsing	Repeating a sequence of events or symbols as a basic component of learning, such as counting by tens or practising recitation of a rhyme with gestures, counting by tens or practising recitation of a poem.	
Acquiring concepts: Developing competence to understand and use basic and complex concepts related to the characteristics of things, persons or events		
Acquiring basic concepts	Learning to use such concepts as size, form, quantity, length, same, opposite.	
Acquiring complex concepts	Learning to use such concepts as classification, grouping, reversibility, seriation.	
Learning to read: Developing the competence to read written material (including Braille and other symbols) with fluency and accuracy, such as recognizing characters and alphabets, sounding out written words with correct pronunciation, and understanding words and phrases		
Acquiring skills to recognize symbols including figures, icons, characters, alphabet letters and words	Learning elementary actions of deciphering letters and symbols, characters, and letters and words.	
Acquiring skills to sound out	Learning elementary actions of sounding out letters, symbols and words.	

written words		
Acquiring skills to understand written words and phrases	Learning elementary actions to grasp the meaning of written words and texts.	
Learning to write: Developing the competence to produce symbols that represent sounds, words or phrases in order to convey meaning (including Braille writing and other symbols), such as spelling effectively and using correct grammar		
Acquiring skills to use writing implements	Learning elementary actions of writing down symbols or letters, such as holding a pencil, chalk or brush, writing a character or a symbol on a of piece paper, using a brailler, keyboard or peripheral device (mouse).	
Acquiring skills to write symbols, characters and alphabet	Learning elementary skills to transpose a sounded or a morpheme into a symbol or a character grapheme.	
Acquiring skills to write words and phrases	Learning elementary skills to transpose spoken words or ideas into written words or phrases.	
Learning to calculate: Developing the competence to manipulate numbers and perform simple and complex mathematical operations, such as using mathematical signs for addition and subtraction and applying the correct mathematical operation to a problem		
Acquiring skills to recognize numerals, arithmetic signs and symbols	Learning elementary skills to recognize and use numbers, arithmetic signs and symbols.	
Acquiring skills of numeracy such as counting and ordering	Learning elementary skills to acquire the concept of numeracy and concepts of the sets.	
Acquiring skills in using basic operations	Learning arithmetic skills to use operations of addition, subtraction, multiplication.	
Acquiring skills: Developing basic and complex competencies in integrated sets of actions or tasks so as to initiate and follow through with the acquisition of a skill, such as manipulating tools or toys, or playing games		
Acquiring basic skills	Learning elementary, purposeful actions, such as learning to wave in response, to use simple tools such	

	as pencils and eating utensils.	
Acquiring complex skills	Learning integrated sets of actions so as to follow rules and to sequence and coordinate one's movements, such as learning to play games (e.g. football or chess) and to use a building tool.	
Focussing attention: Intentionally focusing on specific stimuli, such as by filtering out distracting noises		
Focussing attention on the human touch, face and voice	Intentionally attending to features of other persons, such as their face, touch or voice.	
Focussing attention to changes in the environment	Intentionally attending to some element of the environment, such as changes in the quality, quantity or intensity of physical or social stimuli.	
Directing attention	Intentionally maintaining attention to specific actions or tasks for an appropriate length of time.	
Thinking: Formulating and manipulating ideas, concepts, and images, whether goal-oriented or not, either alone or with others, with types of thinking activities, such as pretending, playing with words, creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating or reflecting.		
Pretending	Engaging in make-believe activities involving imaginary persons, places, things or events.	
Speculating	Manipulating ideas, concepts or images by guessing or assuming something based on incomplete facts or information.	
Hypothesizing	Manipulating ideas, concepts or images involving the use of abstract thought to state assumptions or to test unproven facts.	

Rating scale: **1: Not related at all 2: Mildly related3: Moderately related 4: Closely related**

Reading: Performing activities involved in the comprehension and interpretation of written language (e.g. books, instructions, newspapers in text or Braille), for the purpose of obtaining general knowledge or specific information.		
Using general skills and strategies of the reading process	Recognizing words by applying phonetic and structural analysis and using contextual cues in reading aloud or in silence.	

Comprehending written language	Grasping the nature and meaning of written language in reading aloud or in silence.	
Writing: Using or producing symbols or language to convey information, such as producing a written record of events or ideas or drafting a letter.		
Using general skills and strategies of the writing process	Applying words which convey appropriate meaning, employing conventional sentence structure.	
Using grammatical and mechanical conventions in written composition	Applying standard spelling, punctuation and proper case forms, etc.	
Using general skills and strategies to complete compositions	Applying words and sentences to convey complex meaning and abstract ideas.	
Calculating: Performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results, such as computing the sum of three numbers or finding the result of dividing one number by another.		
Using simple skills and strategies of the calculation process	Applying concepts of numeracy, operations and sets to perform calculations.	
Using complex skills and strategies of the calculation process	Applying mathematical procedures and methods such as algebra, calculus and geometry to solve problems.	
Solving problems: Finding solutions to questions or situations by identifying and analysing issues, developing options and solutions, evaluating potential effects of solutions, and executing a chosen solution such as in resolving a dispute between two people.		
Solving simple problems	Finding solutions to a simple problem involving a single issue or question, by identifying and analysing the issue, developing solutions, evaluating the potential effects of the solutions and executing a chosen solution.	

Solving complex problems	Finding solutions to a complex problem involving multiple and interrelated issues, or several related problems, by identifying and analysing the issue, developing solutions, evaluating the potential effects of the solutions and executing a chosen solution.	
Making decisions	Making a choice among options, implementing the choice, and evaluating the effects of the choice, such as selecting and purchasing a specific item, or deciding to undertake and undertaking one task from among several tasks that need to be done.	
Undertaking a single task	Carrying out simple or complex and coordinated actions related to the mental and physical components of a single task, such as initiating a task, organizing time, space and materials for a task, pacing task performance, and carrying out, completing and sustaining a task.	
Undertaking multiple tasks	Carrying out simple or complex and coordinated actions as components of multiple, integrated and complex tasks in sequence or simultaneously.	

Rating scale: **1: Not related at all** **2: Mildly related** **3: Moderately related** **4: Closely related**

Handling stress and other psychological demands: Carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction, or crises, such as taking exams, driving a vehicle during heavy traffic, putting on clothes when hurried by parents, finishing a task within a time-limit or taking care of a large group of children.		
Handling responsibilities	Carrying out simple or complex and coordinated actions to manage the duties of task performance and to assess the requirements of these duties.	
Handling stress	Carrying out simple or complex and coordinated actions to cope with pressure, emergencies or stress associated with task performance, such as waiting for one's turn, reciting in class, systematically looking for lost items and keeping track of time.	
Handling crisis	Carrying out simple or complex and coordinated actions to cope with decisive turning points in a situation or times of acute danger or difficulty, such as deciding the proper point at which to ask for help and to ask the right person for help.	

Communicating with receiving spoken messages	Comprehending literal and implied meanings of messages in spoken language, such as understanding that a statement asserts a fact or is an idiomatic expression, such as responding and comprehending spoken messages.	
Communicating with receiving nonverbal messages	Comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings, such as realizing that a child is tired when she rubs her eyes or that a warning bell means that there is a fire.	
Communicating with receiving written messages	Comprehending the literal and implied meanings of messages that are conveyed through written language (including Braille), such as following political events in the daily newspaper or understanding the intent of religious scripture.	
Speaking	Producing words, phrases and longer passages in spoken messages with literal and implied meaning, such as expressing a fact or telling a story in oral language.	

Rating scale: **1: Not related at all** **2: Mildly related** **3: Moderately related** **4: Closely related**

Producing nonverbal messages: Using gestures, symbols and drawings to convey messages, such as shaking one's head to indicate disagreement or drawing a picture or diagram to convey a fact or complex idea.		
Producing body language	Conveying messages by intentional movements of the body, such as facial gestures (e.g. smiling, frowning, wincing), by arm and hand movements, and by postures (e.g. embracing to indicate affection or pointing to receive attention or an object).	
Producing signs and symbols	Conveying meaning by using signs and symbols (e.g. icons, Bliss board, scientific symbols) and symbolic notation systems, such as using musical notation to convey a melody.	
Producing drawings and photographs	Conveying meaning by drawing, painting, sketching, and making diagrams, pictures or photographs, such as drawing a map to give someone directions to a location.	
Writing messages	Producing the literal and implied meanings of messages that are conveyed through written language, such as writing a letter to a friend.	

Appendix 5

LSP Tool (Final) along with the model interview questions.

Learning Skills Profile Tool

Rules of Administration

Background

An important component of most forms of career counselling is career assessment. Career assessment employs various tests to assess interests, abilities and strengths of the person for the purpose of guiding individuals to careers that are best suited for them. The tests that are generally used are verbal in format. Typically, such tests are to be administered in standardised formats and scores are interpreted according to normative samples.

Children with dyslexia experience difficulties with language (e.g., reading comprehension) and cognitive functions (e.g., attention). The nature and severity of these difficulties can vary from one child to another. Due to their verbal nature, these tests can pose significant limitations in their relevance to children with dyslexia.

Furthermore, such tests tend to highlight the weaknesses rather than the strengths of children with dyslexia. As a result, career counselling that does not have suitable tools could fail to meet the needs of children with dyslexia.

The Learning Skills Profile Tool will help to analyse an individual's strengths and weaknesses in learning that arise as a result of dyslexia. This profile will be referred to as a *learning skills profile*. The career counsellor would use the Learning Skills Profile to understand the strengths of the child with dyslexia and use this information to administer career guidance related instruments in a manner that would tap into the strengths rather than weaknesses of the child with dyslexia.

Administration

Instruct the student that he or she will be administered tests to assess his or her interests and aptitudes. Describe to the student the nature of the test: that the test is verbal (requires the student to read and comprehend) and speeded (requires the student to answer in a fixed duration of time). Inform the child that before you give him or her the test, you will ask them questions to understand if she has difficulties in certain areas that may affect his or her performance on the test. Make the child aware that this is being done in order to give them necessary accommodations on the test that will help them get the best results from the test.Now, instruct the child as follows:

"The first area we will look at is Concentrating (**Attention).** Attention is our ability to focus or concentrate on an activity or a task for a sufficient duration of time. For example, when you pay attention to the teacher's lecture in class or when reading a book or playing a game. When a person has difficulties with attention, he/she finds it difficult to focus on one task for the needed time because one is easily distracted by other thoughts or events."

Can you tell me what you have understood is attention? (Ensure that the child has understood the concept of attention.)

"Now, I will ask you some specific questions about your attention OR your ability to concentrate OR how much/how well you can concentrate."

1. Do you experience difficulties when you try to focus on a task? Tell me about it.
2. How often do you experience this difficulty? Rarely, Often, Very often, All the time
3. How much does this affect you? Does it get worse during certain activities?
4. How do you think this difficulty has affected your daily activities? How do you think this difficulty has affected your academic activities?

"The next area we will look at is Remembering (**Memory)**. Memory refers to our ability to store information and use it when needed. Memory helps us to store old information such as memories of our childhood as well as new information such as the name of a place or a phone number. When a person has difficulties with memory, he/she finds it difficult to remember information."

Can you tell me what you have understood about memory? (Ensure that the child has understood the concept of memory.)

"Now, I will ask you some specific questions about your memory OR your ability to remember information OR how much/how well you can remember information."

1. Do you experience difficulties when you try to remember newly learned information? Tell me about it.
2. How often do you experience this difficulty? Rarely, Often, Very often, All the time
3. How much does this affect you? Does it get worse during certain activities?
4. How do you think this difficulty has affected your daily activities? How do you think this difficulty has affected your academic activities?

"The next area we will look at isRecognising words and letters (**Visual Perception)**. Visual Perception is our ability to see and recognize shape, size and colour of any object or thing. It is what helps us to read and recognize letters and words. When a person has difficulties with visual perception, he/she finds may be slow at reading, require a lot of effort to read or make many mistakes when reading."

Can you tell me what you have understood about visual perception? (Ensure that the child has understood the concept of visual perception.)

"Now, I will ask you some specific questions about your ability to recognize letters and words when reading OR how much/how well you can recognize letters and words when reading."

1. Do you experience difficulties with recognising letters and words when you read? Tell me about it.
2. How often do you experience this difficulty? Rarely, Often, Very often, All the time
3. How much does this affect you? Does it get worse during certain activities?
4. How do you think this difficulty has affected your daily activities? How do you think this difficulty has affected your academic activities?

"The next area we will look at isUnderstanding what you hear (**Reception of spoken language)**. This refers to our ability to understand the meaning of things that we hear. This helps us to have a meaningful conversation or to understand any information that is told to us. When a person has difficulties with reception of spoken language, he/she may have to ask for information told to them to be repeated or clarified in order to understand it."

Can you tell me what you have understood about reception of spoken language? (Ensure that the child has understood the concept of reception of spoken language.)

"Now, I will ask you some specific questions about your ability to understand things that you hear OR how much/how well you can understand things that you hear."

1. Do you experience difficulties with understanding things that you hear/are told to you by someone? Tell me about it.
2. How often do you experience this difficulty? Rarely, Often, Very often, All the time
3. How much does this affect you? Does it get worse during certain activities?
4. How do you think this difficulty has affected your daily activities? How do you think this difficulty has affected your academic activities?

"The next area we will look at is understanding what you read (**Reception of written language)**. This refers to our ability to understand the meaning of things that we read. This helps us to understand

any information that we read, for example, stories or articles, or your textbooks. When a person has difficulties with reception of written language, he/she may have to read material more than one time or get it clarified by others in order to understand it."

Can you tell me what you have understood about reception of written language? (Ensure that the child has understood the concept of reception of written language.)

"Now, I will ask you some specific questions about your ability to understand things that you read OR how much/how well you can understand things that you read."

1. Do you experience difficulties with understanding things that you read? Tell me about it.
2. How often do you experience this difficulty? Rarely, Often, Very often, All the time
3. How much does this affect you? Does it get worse during certain activities?
4. How do you think this difficulty has affected your daily activities? How do you think this difficulty has affected your academic activities?

"The next area we will look at is**Writing**. This refers to our ability to use language in writing to convey information, for example, when we write a letter to a friend or answer a question in a written examination. When a person has difficulties with writing, he/she may find it difficult to express their ideas by writing (as compared to talking about it) or may make spelling or grammatical errors when writing.

Can you tell me what you have understood about writing? (Ensure that the child has understood the concept of reception of writing.)

"Now, I will ask you some specific questions about your ability to write and convey information OR how much/how well you can write and convey information."

1. Do you experience difficulties with writing to convey information? Tell me about it.
2. How often do you experience this difficulty? Rarely, Often, Very often, All the time
3. How much does this affect you? Does it get worse during certain activities?
4. How do you think this difficulty has affected your daily activities? How do you think this difficulty has affected your academic activities?

Name:	Age:	Class:	School:	Date:

Learning Skills Profile

Datasheet

ATTENTION		
Frequency		
Report	**Client**	**Proxy**
Intensity		
Report	**Client**	**Proxy**
Effect		
Report	**Client**	**Proxy**

MEMORY		
Frequency		
Report	**Client**	**Proxy**
Intensity		
Report	**Client**	**Proxy**
Effect		
Report	**Client**	**Proxy**

VISUAL PERCEPTION		
Frequency		
Report	**Client**	**Proxy**
Intensity		
Report	**Client**	**Proxy**
Effect		
Report	**Client**	**Proxy**

RECEPTION OF SPOKEN LANGUAGE		
Frequency		
Report	**Client**	**Proxy**
Intensity		
Report	**Client**	**Proxy**
Effect		
Report	**Client**	**Proxy**

RECEPTION OF WRITTEN LANGUAGE		
Frequency		
Report	**Client**	**Proxy**
Intensity		
Report	**Client**	**Proxy**
Effect		
Report	**Client**	**Proxy**

WRITING		
Frequency		
Report	**Client**	**Proxy**
Intensity		
Report	**Client**	**Proxy**
Effect		
Report	**Client**	**Proxy**

Appendix 6

Ethical Guidelines of the Study

ETHICAL GUIDELINES FOR MY RESEARCH

1. All references must be properly noted.
2. All structured tools must be cited. Researcher must follow legal procedures before using Tools which needs permission before modification or usage.
3. Informed consent must be given before administering any questionnaire.
4. Control Group schools in the study will be given the intervention free of cost after the research has been completed.
5. Report of findings must be shared with the participating schools after the whole research study has been finally accepted and approved.
6. No aspect of the study must be carried out by the researcher without consulting the Guide.
7. Respect towards school authorities and students must be observed by the researcher.
8. Confidentiality must be highly observed for any issues shared by any participating individuals.
9. All procedures and requirements of the Guide and the MLCU Doctoral Committee must be fulfilled by the researcher to qualify for the granting of the degree opted for.
10. All financial aspects of the research must be recorded and maintained for transparency and accountability.

Appendix 7

Application Letter for Ethics Approval

From,

SajmaAravind
Project Manager
The Promise Foundation
Bangalore

To,

Dr Bonnie M Nicol
Secretary
Doctoral Committee
MLCU

Date:

05.11.2014

Dear Dr. Bonnie

Greetings! Kindly find enclosed the Ethics Approval form for my research proposal titled "**Development of an Assessment Method for the Career Counselling of Children with Dyslexia**" under the guidance of Dr. Gideon Arulmani. I have also enclosed other relevant documents that were asked for. Kindly let me know regarding the approval for my research proposal from the Ethics Committee.

Thank you

SajmaAravind

Ethics Clearance

Martin Luther Christian University

Block-1, Dongktieh, Nongrah, Shillong-793006, Meghalaya, India

✆+91- 8974068427, 0364-2506489 (fax)

e-mail: admin@mlcuniv.in, www.mlcuniv.in

The Light of Truth

May 4, 2015 MLCU/UREC-2015/ 08

Ms. Sajma Aravind
PhD Research Scholar
Martin Luther Christian University
Shillong, Meghalaya

Subject: Ethical approval of research project

Dear Ms. Aravind,

We would like to inform you that your research project entitled "Development of an assessment method for the career counseling of children with Dyslexia" has been approved by the University Research Ethics Committee (UREC). It has examined the ethical considerations taken by you in the data collection during December 2014 prior to this approval, and it also approves the same.

Please include a copy of this letter in your thesis in an annexure.

We wish you all the best in your research study.

Yours sincerely,

4/5/2015

Dr Melari Shisha Nongrum
Secretary
University Research Ethics Committee
MLCU

Appendix 8:

Informed Consent Form Blank (Student)

Development of an Assessment Method for the Career Counselling of Children with Dyslexia

Informed Consent Form

Title of study: Development of an Assessment Method for the Career Counselling of Children with Dyslexia

Principal Investigator: Sajma Aravind

I have been informed about the procedures to be used and agree to participate in this study. I understand that participation in this study is optional. I also understand that all the information about me will be kept confidential and that my name will not be used in connection with the results in any way. I understand that I have the right to obtain information about the findings of this study and about how they will be used after the study is completed.

Signature: Date:

THANK YOU!

Appendix 9

Permission letter from Brindavan School, Bangalore

Brindavan Education Trust

456, 9-A Main Road, 2nd Block, Jayanagar, Bengaluru -560 011.
Phone : 2656 7311, 4161 4211 E.mail : brindavansld@gmail.com

From

Ms. Veena Venkataramu
Coordinator – Senior Centre
Brindavan Education Trust
Bangalore

Date: 1.3.2016

To

Ms. Sajma Aravind
Project Manager
The Promise Foundation
Bangalore

Sub: Request to work with Senior Centre students and permission thereof

Dear Sajma,

With reference to your request as stated in the subject cited above, this is to certify that we hereby grant you permission to work with our Senior Centre students and their parents as part of your PhD Research programme entitled "Development and Evaluation of an Assessment Method for the Career Counselling of Children with Dyslexia."

With best wishes,

Veena Venkataramu

Ms. Veena Venkataramu
Coordinator – Senior Centre
Brindavan Education Trust

607, 13th Cross, 14th Main, J.P. Nagar 2nd Phase, Bengaluru - 560 078. Phone : 2658 1692

Appendix 10

Informed Consent Form Blank (Parent)

Development of an Assessment Method for the Career Counselling of Children with Dyslexia

Informed Consent Form (Parent)

Title of study: Development of an Assessment Method for the Career Counselling of Children with Dyslexia

Principal Investigator: Sajma Aravind

I have been informed about the procedures to be used and agree to participate in this study. I understand that participation in this study is optional. I also understand that all the information about me and my child will be kept confidential and that my name or my child's name will not be used in connection with the results in any way. I understand that I have the right to obtain information about the findings of this study and about how they will be used after the study is completed.

Signature: Date:

THANK YOU!

Appendix 11

Career Guidance Resources (FOR TRIAL)

Assessment of Suitability for Test Taking

Name:	Age:
School:	Grade:

1. Delays in development of speech

a. When did the child start talking?

b. How was his or her learning of speech (talking different) from that of peers?

2. Long term difficulties with reading and spelling

a. What are the difficulties that the student has experienced with reading and spelling?

b. Since when has he/she experienced these difficulties and for how long?

c. How have reading and spelling affected the student?

3. Difficulty with paying attention to academic tasks

a. What are the difficulties that the student faces in paying attention to academic tasks?

b. How has this affected him/her?

4. History of school shifts

a. Has the student repeatedly changed schools during his or her education?

b. What were the reasons for shifting school?

References

Ackerman, P. L., & Beier, M. E. (2003). Intelligence, personality, and interests in the career choice process. *Journal of Career Assessment, 11*(2), 205-218. doi: 10.1177/1069072703011002006

Alston, R. J., Bell, T., & Hampton, J. (2002). Learning disability and career entry into the sciences: A critical analysis of attitudinal factors. *Journal of Career Development, 28*(4), 263–275.

American Psychological Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Anctil, T. M., Ishikawa, M. E., & Scott, A. T. (2008). Academic identity development through self determination: Successful college students with learning disabilities. *Career Development for Exceptional Individuals, 31*(3), 164-174.

Aravind, S., & Nag, S. (2014).Exploring career assessment frameworks for children with learning disabilities. *Indian Journal of Career and Livelihood Planning, 2*(1), 40-52.

Aravind, S., Nag, S., & Arulmani, G. (2015). A learning skills approach to the career assessment of individuals with dyslexia. *Career Planning & Adult Development Journal, 31*(4), 162-171.

Aravind, S., Sailo, E., Nag, S., & Arulmani, G. (2011, December). *"I'm learning so much more than I thought I would".* Poster presented at the Symposium of Language, Literacy and Cognitive Development, Bangalore, India.

Arulmani, G. (2004). *The Jiva method: A three-year post intervention review*. Bangalore, India: The Promise Foundation.

Arulmani, G. (2005). *The development and validation of the Multiple Potentials Test-5 (MPT-5).* Bangalore, India: The Promise Foundation.

Arulmani, G. (2006). *Employment Skills Training Project (Asian Development Bank 2028-MLD): Career Guidance and Social Marketing Component*. Male, Maldives: Asian Development Bank.

Arulmani, G. (2008). *The Development and Validation of Career Belief Patterns Scale (Version 2) Monograph*. Bangalore, India: The Promise Foundation.

Arulmani, G. (2009). *Career and livelihood planning: Training manual.* Bangalore, India: Jiva Project, The Promise Foundation.

Arulmani, G. (2010). *The Jiva approach to career guidance and counselling: An Indian model* (Project Report). Bangalore, India: The Promise Foundation.

Arulmani, G. (2014a). The cultural preparation process model and career development. In G. Arulmani, A. J. Bakshi, F. T. L. Leong, & A. G. Watts (Eds.), *Handbook of career development: International perspectives* (pp. 81-104). New York, NY: Springer International.

Arulmani, G. (2014b). Assessment of interest and aptitude: A methodologically integrated approach. In G. Arulmani, A. J. Bakshi, F. T. L. Leong, & A. G. Watts (Eds.), *Handbook of career development: International perspectives* (pp. 609-630). New York, NY: Springer.

Arulmani, G. (2014c). *Preparing a guide on career guidance for rural areas and piloting it in Vietnam: Final report*. Hanoi, Vietnam: International Labour Organization.

Arulmani, G. (2015a). The question is the answer: The cultural preparedness approach to assessment for career guidance. In M. McMahon & M. Watson (Eds.), *Career Assessment: Qualitative Approaches.* Netherlands: Sense Publishers.

Arulmani, G. (2015b). *Adaptation of the Jiva mixed methods approach to assessment for use with immigrants in Sweden*. City of Gothenburg, Sweden: Career Guidance Centre.

Arulmani, G. (2016). *Pilot Assessment to Identify Training Needs of Career Guidance Officers in North Sri Lanka: Final Report to Deutsche Gesellschaft Fur International Zusammenarbeit (GIZ),* Sri Lanka Colombo, Sri Lanka.

Arulmani, G., & Aravind, S. (2017-18). Developing a culturally sensitive assessment tool of career guidance and counselling in Nepal. Final Report to Helvetas. Kathmandu, Nepal.

Arulmani, G., Miranda, R., & Buela, S. (2018). *A review of the outcomes of the Jiva intervention amongst government high school students: Project outcomes report*. Bangalore, India: The Promise Foundation.

Arulmani, G., & Nag-Arulmani, S. (2004). *Career counselling: A handbook*. Tata McGraw Hill: New Delhi, India.

Aula, S. (2014, November). *The problem with the English language in India.* Retrieved from www.forbes.com

Banerjee, R., Mehendale, A., & Nanjundaiah, M. (Eds.). (2011). *Understanding inclusive practices in schools: Examples of schools from India*. Bangalore, India: Seva-In Action.

Bassot, B. (2014). Enabling culturally sensitive career counseling through critically reflective practice: The role of reflective diaries in personal and professional development. In G. Arulmani, A. J. Bakshi, F. T. L. Leong, & A. G. Watts (Eds.), *Handbook of career development: International perspectives* (pp. 453-464). New York, NY: Springer.

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report, 13*(4), 544-559.

Bennett, G., Seashore, H., & Wesman, A. (1956). The Differential Aptitude Tests: An Overview. *The Personnel and Guidance Journal, 35*(2), 81-91.

Brisenden, S. (1986). Independent living and the medical model of disability. *Disability, Handicap, & Society, 1*(2), 173-178.

Census of India. (2011). Retrieved from http://www.censusindia.gov.in/2011-Common/CensusData2011.html

Central Board of Secondary Education (CBSE). (2017). *Circular* (CBSE/COORD/112233/2016). New Delhi, India: Author.

Cohen, D., & Crabtree, B. (2006). *Qualitative research guidelines project*. Retrieved from http://www.qualres.org/HomeTria-3692.html

Cohen, R. J., & Swerdlik, M. E. (2005). *Psychological testing and measurement: An introduction to tests and measurement* (6th ed.). New York, NY: Tata McGraw Hill.

Council for the Indian School Certificate Examinations (CISCE). (2017). *Concessions.* Retrieved from http://www.cisce.org/Concessions.aspx

Crawford, S. G. (2007). Specific learning disabilities and attention-deficit hyperactivity disorder: Under-recognized in India. *Indian Journal of Medical Science, 61*,637-638. Available from http://www.indianjmedsci.org/text.asp?2007/61/12/637/37783

Creswell, J. H. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. New Delhi, India: Sage publications.

Crow, L. (1996). Including all of our lives: Renewing the social model of disability. In J. Morris (Ed.), *Encounters with strangers: Feminism and disability*. London, UK: Women's Press.

Dik, B. J., & Hansen, J.-I.C. (2008). Following passionate interests to well-being. *Journal of Career Assessment, 16*(1), 86-100. doi: 10.1177/1069072707305773

Elliott, J. (2005). The dyslexia debate continues. *The Psychologist, 18*(12), 728-730.

Enright, M. S., Conyers, L. M., & Szymanski, E. M. (1996). Career and career-related concerns of college students with disabilities. *Journal of Counseling and Development, 75,* 103-114.

Flick, U. (1998). *An introduction to qualitative research.* London, UK: Sage.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences.* New York, NY: Basic Books.

Garrett, H. E. (1967) .*Statistics in Psychology and Education* (6th ed.). New York, NY: Longmans Green and Co.

Gottfredson, L. S. (2003). The challenge and promise of cognitive career assessment. *Journal of Career Assessment, 11*(2), 115-135.

Guion, L. A., Diehl, D. C., & McDonald, D. (2011). *Triangulation: Establishing the validity of qualitative studies*. Retrieved from http://www.ie.ufrj.br/intranet/ie/userintranet/hpp/arquivos/texto_7_-_aulas_6_e_7.pdf

Hansen, J. C. (2005). Assessment of interests. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work*. New York, NY: John Wiley.

Heale, R., & Twycross, A. (2018). What is a case study? *Evidence-Based Nursing* ; *21***,** 7-8.

Heiman, T., & Precel, K. (2003). Students with learning disabilities in higher education: Academic strategies profile. *Journal of Learning Disabilities, 36*(3), 248-258.

Hitchings, W. E., Luzzo, D. A., Ristow, R., Horvath, M., Retish, P., & Tanners, A. (2001). The career development needs of college students with learning disabilities: In their own words. *Learning Disabilities Research and Practice, 16*(1), 8-17.

Hulme, C., & Snowling, M. J. (2009). *Developmental disorders of language learning and cognition*. West Sussex, UK: Wiley-Blackwell.

ICD-11 Beta Draft. (n.d.). Retrieved from https://icd.who.int/dev11/l-m/en

International Labour Organization (ILO). (2013). *Career guidance policy and practice: a strategic tool for planners and decision makers in employment, education and training*. Turin, Italy: Author.

Jeffery, R., & Singal, N.(2008). Measuring disability in India. *Economic and Political Weekly, 43*, 12-13. Retrieved from http://nbn-resolving.de/urn:nbn:de:0168-ssoar-69620

John, P., George, S. K., & Mampilli, A. B. (2004). Dyslexia in India. In I. Smythe, J. Everatt, & R. Salter (Eds.), *The international book of dyslexia: A guide to practice and resources* (pp. 122-127). England, UK: John Wiley & Sons.

Johnstone, C., Liu, K., Altman, K., & Thurlow, M. (2007). *Student think aloud reflections on comprehensible and readable assessment items: Perspectives on what does and does not make an item readable* (Technical Report 48). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

Joshi, J. (2017). *Impact of Career Guidance Interventions for Rural Disadvantaged Youth in India*. Manuscript in preparation.

Kirby, J., Silvestri, R., Allingham, B., Parrila, R., & La Fave, C. (2008). Learning strategies and study approaches of post secondary students with dyslexia. *Journal of Learning Disabilities, 41*(1), 85-96.

Leong, F. T. L., & Pearce, M. (2011). Desiderata: Towards indigenous models of vocational psychology. *International Journal for Educational and Vocational Guidance, 11*(2), 65-77.

Luzzo, D. A., Hitchings, W. E., Retish, P., &Shoemaker, A. (1999). Evaluating differences in college students' career decision making on the basis of disability status. *The Career Development Quarterly, 48*(2), 142-156.

Low, K. S. D., Yoon, M., Roberts, B. W., & Rounds, J. (2005). The stability of vocational interests from early adolescence to middle adulthood: A quantitative review of longitudinal studies. *Psychological Bulletin, 131*(5), 713-737. doi: 10.1037/0033-2909.131.5.713.

McMahon, M., & Patton, W. (1995). Development of a systems theory of career development. *Australian Journal of Career Development, 4*(2), 15-20.

Ministry of Social Justice and Empowerment. (2001). *Disability Guidelines.* New Delhi, India: Author.

Myers, I. B., & Briggs, K. C. (1962). *The Myers Briggs Type Indicator: Manual*. Palo Alto, CA: Consulting Psychologists Press.

Nag, S. (2011). Special educational needs, social cognitive environments, and preparing for the world of work. *International Journal of Educational and Vocational Guidance, 11*(2), 125-138.

Nag, S. (2014). Special educational needs, social cognitive environments and preparing for the world of work. In G. Arulmani, A. J. Bakshi, F. T. L. Leong, & A. G. Watts (Eds.), *Handbook of career development: International perspectives* (pp. 497-512). New York, NY: Springer.

Nag, S., & Snowling, M. J. (2012). School underachievement and specific learning difficulties. In J. M. Rey (Ed.), *IACAPAP e-textbook of child and adolescent mental health.* Geneva, Switzerland: International Association for Child and Adolescent Psychiatry and Allied Professions.

National Institute of Open Schooling (NIOS). (n.d.). Home page of the NIOS website. Retrieved from http://www.nios.ac.in/

Odom, S. L., Horner, R. H., Snell, M. E., & Blacher, J. (2007).The construct of developmental disabilities. In S. L. Odom, R. H. Horner, M. E. Snell, & J. Blacher (Eds.), *Handbook of Developmental Disabilities.* The Guilford Press: New York, NY.

Organisation for Economic Co-operation and Development (OECD). (2004). *Career guidance: A handbook for policy makers.* Paris, France: Author.

OECD. (n.d.). Youth employment and unemployment. Retrieved from http://www.oecd.org/employment/action-plan-youth.htm

Parmenter, T. R. (2011). *Promoting training and employment opportunities for people with intellectual disabilities* (Employment working paper no. 103). Geneva, Switzerland: ILO.

Parsons, F. (1909). *Choosing a vocation*. Boston, MA: Houghton Mifflin.

Pentland, W., McColl, M. A., & Rosenthal, C. (1995).The effect of aging and duration of disability on long term health outcomes following spinal cord injury.

Paraplegia, 33, 367-373. Abstract retrieved from https://www.nature.com/sc/journal/v33/n7/abs/sc199584a.html

Phelps, L. A., & Hanley-Maxwell, C. (1997). School-to-work transitions for youth with disabilities: A review of outcomes and practices. *Review of Educational Research, 67*(2), 197-226.

Powers, T. (2008).*Recognizing ability: The skills and productivity of persons with disabilities. Literature Review* (Employment working paper no. 3). Geneva, Switzerland: ILO.

Ramanathan, V. (1999). "English is here to stay": A critical look at institutional and educational practices in India. *Tesol Quarterly, 33*(2), 211-232.

Reid, H. L. (2005). Narrative and career guidance: Beyond small talk and towards useful dialogue for the 21st century. *International Journal for Educational and Vocational Guidance*, 5, 125-136.

Reid, H., & West, L. (2014). Telling tales: Do narrative approaches for career counselling count? In G. Arulmani, A. J. Bakshi, F. T. L. Leong, & A. G. Watts (Eds.), *Handbook of career development: International perspectives* (pp. 413-430). New York, NY: Springer.

Rehabilitation Council of India (RCI). (n.d.). *Learning Disabilities.* Retrieved from http://www.rehabcouncil.nic.in/writereaddata/ld.pdf

Sampson, J. P., Jr., Peterson, G. W., Lenz, J. G., Reardon, R. C., & Saunders, D. E. (1996). *Career Thoughts Inventory*. Odessa, FL: Psychological Assessment Resources, Inc.

Sangma, M. (2014).*Career orientations and career counselling: A school based intervention study of urban and rural high school students in the East Khasi*

Hills District (Unpublished doctoral dissertation). Martin Luther Christian University, Shillong, India.

Sahoo, M. K., Biswas H., & Padhy S. (2015). Psychological co-morbidity in children with specific learning disorders. *Journal of Family Medicine and Primary Care, 4*(1), 21-25.

Sena, J. D. W., Lowe, P. A., & Lee, S. W. (2007). Significant predictors of text anxiety among students with and without learning disabilities (Abstract). *Journal of Learning Disabilities,* 40(4), 360. Retrieved from http://connection.ebscohost.com/c/articles/25643858/significant-predictors-test-anxiety-among-students-without-learning-disabilities

Siegel, L. S. (1999). Issues in the definition and diagnosis of learning disabilities. *Journal of Learning Disabilities, 32*(4), 304-391.

Sireci, S. G., Li, S., & Scarpati, S. (2006). *The effects of test accommodation on test performance: A review of the literature* (Research Report No. 485). Amherst, MA: Center for Educational Assessment, University of Massachusetts.

Siqueira, C. M., & Gurge-Giannetti, J. (2011). Poor school performance: An updated review. *Rev Assoc Med Bras, 571*(1), 78-86.

Snowling, M. J. (2000). *Dyslexia* (2nd ed.*).* Oxford, UK: Blackwell.

Snyder, M. (1999). Issues in gender-sensitive and disability-responsive policy research, training and action. Retrieved from http://www.un.org/esa/socdev/enable/disrppeg.htm

Sparks, R. L., & Lovett, B. J. (2009). College students with learning disability diagnoses: Who are they and how do they perform? *Journal of Learning Disabilities, 42*(6), 494-510.

Strong, E. K., Jr., Hansen, J. C., & Campbell, D. C. (1985). Strong Vocational Interest Blank. Revised edition of Form T325, Strong-Campbell Interest Inventory. Stanford, CA: Stanford University.

Supreeth, S., & Aravind, S. (2016). Delivering Career Guidance: Case Study of a School-Based Method from India. *Indian Journal of Career and Livelihood Planning, 4*(1), 23-36.

Taylor, M. G. (2010). Capturing transitions and trajectories: The role of socioeconomic status in later life disability. *The Journal of Gerontology: Series B, 65B*(6), 733-743,

Thambirajah, M. S., & Ramanujan, L. L. (2016). *Essentials of learning disabilities and other developmental disorders*. New Delhi, India: Sage.

Timmons, J., Podmostko, M., Bremer, C., Lavin, D., & Wills, J. (2005). *Career planning begins with assessment: A guide for professionals serving youth with educational & career development challenges* (Rev. Ed.). Washington, D.C.: National Collaborative on Workforce and Disability for Youth, Institute for Educational Leadership. Available at www.ncwdyouth.info/resources_&_Publications/manuals.php

UN World Youth Report (n.d.). Retrieved from http://www.unworldyouthreport.org/

Winer, J. L., Pierce, R. A., & Wilson, D. A. (1988). Vocational assessment of learning disabled students using the SDS-E. *Research in Rural Education, 5*(2), 27-30.

Watts, A. G. (2013). Career guidance and orientation. In *Revisiting Global Trends in TVET* (pp. 239-2374). Retrieved from http://www.unevoc.unesco.org/fileadmin/up/2013_epub_revisiting_global_trends_in_tvet_chapter7.pdf

World Health Organization (WHO). (2002). *Towards a common language for functioning, disability and health (ICF)*. Geneva, Switzerland: Author.

WHO. (2011). *World report on disability.* Geneva, Switzerland: Author.

Yanchak, K. V., Lease, S. H., & Strauser, D. R. (2005). Relation of disability type and career thoughts to vocational identity. *Rehabilitation Counseling Bulletin, 48*(3), 130-138.

Yin, R. K. (2009). Case study research: Designs and methods (4th ed.). In *Applied Social Research Method Series* (Vol. 5). Thousand Oaks, CA: Sage.

Zainal, Z. (2007). Case study as a research method. *Jurnal Kemanusiaan.* Retrieved from http://psyking.net/htmlobj-3837/case_study_as_a_research_method.pdf