



Dyslexia and Maths

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Dorian Yeo

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Foreword

This book is one of a series that provide practical insights for class teachers to ensure that it is possible for students with dyslexia to access different subjects in the curriculum.

In this book the authors, Julie Kay and Dorian Yeo, explain the nature of the difficulties that may be experienced by students with dyslexia in the area of mathematics. Although some of the difficulties experienced by students with dyslexia can be generalised to all subjects, in this book the authors specifically pinpoint particular difficulties that apply to mathematics. They discuss the language aspects of maths as well as the conceptual difficulties related to the abstract nature of the subject of maths. They, however, place considerable emphasis throughout the book on the strategies that class teachers can promote and students can use, all of which will help to ease the burden when tackling some of the difficulties associated with maths for students with dyslexia.

All the strategies suggested have been tried and tested by the authors; both are experienced practitioners and they are certainly writing from first-hand experience and this makes the book practical and invaluable to teachers of mathematics.

As well as containing a wealth of strategies for tackling many aspects within the subject of mathematics, the book also discusses the National Numeracy Strategy (NNS) and approaches relating to how maths is presented to the student, and also the important role of acknowledging learning styles.

We, as editors of this series of books, would like to congratulate Julie Kay and Dorian Yeo in writing an accessible, well-organised and structured book. We feel sure it will be widely sought by teachers of mathematics in secondary schools. We feel it will also be invaluable to primary class teachers who are seeking some further understanding of the difficulties that may be experienced by children with dyslexia in the area of number work and mathematics. This book

therefore will be an essential source of reference and guidance in mathematics for all teachers.

Dr Lindsay Peer CBE, Deputy CEO and Education Director of the British Dyslexia Association

Dr Gavin Reid, Senior Lecturer, Moray House School of Education, University of Edinburgh

Authors' Biographies

Dorian Yeo was born and educated in South Africa. She lectured in English Literature at Natal University, South Africa. Shortly after coming to the UK she started teaching dyslexic children. In 1990 she became involved with Jane Emerson and Emerson House was founded in West London. Emerson House is a specialist centre offering intensive full-time and part-time tuition to primary school children with specific learning difficulties. Dorian teaches maths and runs the maths department at Emerson House, offers training for teachers and gives training days in schools. She has written a book, *Dyslexia, Dyspraxia and Mathematics*, which was published by Whurr Publishers in 2002. Dorian is interested in the broader area of children's cognition of numbers and has explored contemporary international research on how children learn about number.

Julie Kay has been a teacher of mathematics for twenty years. Starting as a primary school teacher gave her an excellent understanding of how to address the basic difficulties facing dyslexic students when learning maths. She has taught at Mark College, a specialist school in Somerset for secondary-aged students with dyslexia, since 1990, has been Head of Maths since 1994 and is now Head Teacher. Julie has co-written a series of worksheets designed for dyslexic students working on the NNS. She lectures on mathematics nationally and delivers in-service training for schools. She has conducted classroom studies with European partners into how dyslexic students learn mathematics and has co-presented the results at International and British Dyslexia Association conferences. Julie co-designed and delivered the first AMBDA (Maths) course, run in conjunction with Manchester Metropolitan University.

Chapter 1

Overview of Contemporary Mathematics Education in Schools

Background

Although some pupils thrive in just about any maths learning situation, it is a common observation that many pupils dislike maths at school and believe that they are bad at it. It is also often noted that adults frequently claim that they cannot do maths at all. Historically, school maths has certainly been widely perceived to be a difficult subject.

Throughout the last century, maths educationalists frequently expressed concern about the disappointing standards that the majority of pupils manage to attain in maths. In the past, government-backed reports into poor overall standards in maths often led to the introduction of maths teaching reforms. In England the most current of the many reform initiatives is the National Numeracy Strategy (NNS) (DfEE 1999), which will be discussed in some detail.

In the early discussions of dyslexia, it was often argued that dyslexic pupils do not experience out-of-the-ordinary problems in learning maths. In other words, in the early stages of thinking about dyslexia, it was not thought that dyslexic features might lead to difficulties in learning maths. It was felt that the learning difficulties which dyslexic children experience were mainly confined to

language aspects of learning – and most particularly to difficulties with reading and spelling. Indeed it was sometimes suggested that dyslexic learners are usually good at maths. In the next chapter we will spell out in some detail the complex links between features which are strongly associated with dyslexia and which can lead to difficulties in learning maths.

In this chapter, however, we need first to explore the special nature of maths as a subject. We also need to outline some of the important changes that have taken place in maths teaching.

The special features of mathematics as a subject

What are the unique features of maths as a domain of knowledge, which have contributed to its widespread historical reputation as a difficult subject, and to its unpopularity amongst so many pupils?

There are a number of features of maths which distinguish it from most other subject areas with which children have to deal.

These features help explain why maths has always been hard for so many pupils, including dyslexic pupils, to learn. They also offer some insight, on the other hand, as to why some pupils find maths intrinsically easy to learn.

- (1) In the main, maths is an abstract subject. Strictly speaking, the numeracy aspect of maths is based on concrete quantities (numbers of things in the world) and concrete relationships. However, maths as a domain of knowledge is usually presented to children in a very abstract way and this usually happens from very early on. Young children, and many older pupils, fail to make sense of some aspects of number work because they do not understand what they mean. Some pupils have a weakness in symbolic understanding and may have difficulty grasping the idea that *two*, 2 and $1 + 1$ are the same thing.

On the other hand, some children seem to have an intrinsic (in-built, or early-developed) feel for quantities, which paves the way for a developing ability to visualise abstract numbers and abstract number relationships. This feel for numbers, or basic number-sense, seems to be closely allied with a degree of general visual-spatial competence.