

Facilitating mathematics learning for dyslexic and dyscalculic students:

- ◆ Break up large sections of text with page breaks and bullet points using sans serif fonts such as Arial.
- ◆ Maths books can be difficult to read. It is helpful to photocopy and reorder sections. Diagrams and tables often intersperse text requiring the reader to move backwards and forwards between pages.
- ◆ Break down a multi-step problem into small, manageable steps
- ◆ Coloured pens can highlight various aspects of a question. e.g. three colours can be used triple integration, one for each integral, also number the integrals. Three colours can also be used for quadratic equations, one for each term.
- ◆ Colour can further facilitate greater clarity when using software; e.g. the cells on a spreadsheet can be coloured differently to aid visual perceptual problems.
- ◆ Edit down the output tables of statistical analyses, highlighting the relevant sections
- ◆ Provide as many memory aids as possible, such as using large wall posters. e.g. for inequality signs or for distinguishing between differentiation and integration.
- ◆ Use of card indexes and pocket size "card carrying" cases. One theorem or formula can be put on each card.

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- ◆ Providing flow diagrams or tree diagrams for clarifying procedures. e.g. a tree diagram can be used for partial differentiation, using one branch for each derivative.
- ◆ Provide mind map diagrams to help with more extended pieces of work.
- ◆ Students usually find it helpful to see the functions they are considering. Try to encourage them to sketch functions on the calculator or screen, obtaining an immediate visual image.
- ◆ Provide a "gallery" of graphs to show various functions, transformations or plots. Students can then use this to match their function to one in the "gallery".
- ◆ Go through the work at the student's own pace. Overload can occur frequently and this results in an inability to absorb anything.

Progress is often slow and frequent revision is necessary. The same ground may need to be covered many times. However, by providing the student with appropriate strategies and a framework they can relate to, it is possible for the dyslexic or dyscalculia student to grow in confidence, become independent in their learning and, above all, to succeed.



Dyscalculia and Dyslexia Interest Group

Helping Dyscalculic & Dyslexic Students with Mathematics in H.E.

Visit our website at:
<http://ddig.lboro.ac.uk>

DDIG aims to help dyscalculic and dyslexic students by:

- ◆ Exchanging information between ourselves as H.E. practitioners regarding the links between dyscalculia, dyslexia, maths phobia and the study of Mathematics in Higher Education.
- ◆ Raising awareness of these issues generally and to find out what, if anything at all, has been done in this field, particularly in higher education.
- ◆ Offering a forum for discussion of issues arising from the above.
- ◆ Offering a forum linking and disseminating research and practice.

DDIG meets on a regular basis, and would like to establish contacts with others working in the field of mathematics and dyslexia.

If you would like more information or would like to join DDIG, please contact:

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Mathematical Problems Experienced by Dyslexic Students:

- ◆ Poor arithmetical skills
- ◆ Mathematical procedures and sequences of operations are difficult
- ◆ Learning theorems and formulae is difficult
- ◆ In multi-step problems, students frequently lose their way or omit sections
- ◆ Holding various aspects of a problem in mind and combining them to achieve a final solution is difficult
- ◆ Problems in sequencing complex instructions, and past/future events
- ◆ Failing to equate the question wording with their knowledge of the subject
- ◆ Difficulties reading the words that specify the mathematical problem, especially if the problem is embedded in large amounts of text
- ◆ Slow reading, mis-reading or not understanding what has been read
- ◆ Substituting names that begin with the same letter e.g. integer/integral, diameter/diagram, classify/calculate

Mathematical Problems Experienced by Dyslexic Students:

- ◆ Difficulty remembering and retrieving specialised mathematical vocabulary
- ◆ Problems associating the word with its symbol or function e.g. relating 'integration' to its symbol and knowing what procedure to carry out
- ◆ Visual perception and reversals e.g. $3/E$ or $2/5$ or $+/x$
- ◆ Presentation of work and positioning on the page
- ◆ Problems transferring between mediums e.g. question paper to computer or calculator
- ◆ Frequently losing their place when scrolling up and down a screen
- ◆ Making copying error from line to line e.g. $x+3$ becomes $x-3$. Mathematical or algebraic arguments require careful copying
- ◆ Inadequate documentation of method
- ◆ Slow information processing means that students have few notes. They may copy down example 1 and then example 9, with nothing in between