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Curriculum adjustments for students with learning disabilities in mainstream classrooms.

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Introduction
The stated policies or mission statements of many education systems around the world reflect the widespread realisation that students with learning difficulties and disabilities have both the ability and the right to learn in a normalised environment, and thus include a goal related to helping all students achieve to their potential. Indeed, education is viewed as one of the major ways in which individuals may achieve life goals, as it often holds the key to level of employment and financial security, level of housing and other life opportunities in addition to personal satisfaction and achievement (Allen, 2003; UNESCO, 2001).

Ensuring that all students achieve to their potential becomes increasingly difficult when there is a broad range of abilities within a class. Students with learning difficulties have certain cognitive characteristics that mean that regular class instruction, particularly in large groups, is less effective than for most students in the classroom. Briefly, these characteristics include selective and sustained attention difficulties (Nussbaum, Grant, Roman, Poole, & Bigler, 1990; Scruggs and Mastropieri, 1992; Shaywitz, Fletcher, & Shaywitz, 1992), both short and long-term memory problems (Smith, 2004) and an impulsive rather than a reflective cognitive style (Zentall, 1993). Students with this range of difficulties often have difficulty following directions, in organising themselves and in following through tasks to completion. They tend not to develop effective planning or problem-solving skills because these skills require inhibition of action while considering alternatives. They have difficulty sequencing, classifying, categorising and summarising, because each of these skills demands planning and organising of information (McGee, Partridge, Williams, & Silva, 1991).

The combination of difficulties in cognitive functioning makes it extremely difficult for students to succeed in academic tasks. There can be serious and long-term effects of failing at school. It makes it extremely difficult to develop appropriate social behaviour, resulting in low social status and high levels of rejection among peers, a problem that continues well past childhood (Prior, Smart, Sansom, & Oberklaid, 1999). Many students with learning difficulties will experience poor motivation because of a history of failure. School becomes less and less part of their “quality world” (Glasser, 1993). Such students have demonstrated lowered self-concepts as the result of frustration and long-term failure. In addition, their poor self-concept makes remediation more difficult. The history of failure may also result in either acting out behaviour or withdrawal, as students try to disguise learning problems. Thus there is a great need to respond to the needs of these students to ensure that they, too, are able to reach their full potential.

Responses to Students with Learning Difficulties in Regular Classes
The recognition of the difficulties faced by students with learning difficulties has led to various responses on the part of educators. The notion of modifying or adjusting the curriculum so that students with learning difficulties can access the material more successfully has been widely advocated (Bos & Vaughn, 1991; Conway, 2005; Scott, Vitale & Masten, 1998). The notion of curriculum adjustment is based on the belief that if the full range of the curriculum is presented to students with learning difficulties, they will be overloaded, and so confused that they will not even grasp the basic information.

There have been other writers in the field, however, who believe that making adjustments for students with learning difficulties denies them access to the full range of the curriculum; in effect it “waters down” the curriculum (Perry, 1993; Westwood, 2001). Westwood claims that curriculum differentiation is problematic for a number of reasons: it denies full access to the curriculum, thus increasing the learning gap between students with learning difficulties and regular students; it requires the time-consuming construction of different materials for the same lesson; and that neither the students themselves nor their parents wish them to have different material from the rest of the class (p. 7).

This paper takes the view that because of the range of difficulties experienced by students with learning difficulties, some adjustments may need to be made to what is taught, and how it is taught if they are to achieve success in mainstream classrooms. This requires an analysis of student needs, and matching of the curriculum and the learning environment to suit those needs as closely as possible. Thus curriculum differentiation, or curriculum adjustment (and both terms will be used synonymously in this paper), is seen to be necessary if students with learning difficulties are to succeed in a mainstream classroom (Kyriacou, 1997). Both terms
recognise the great diversity represented in today’s classrooms, and acknowledge that students have differing needs and strengths. Curriculum adjustments are aimed at increasing the variety in teaching, learning and assessment in order to reach more students and respond to their individual needs, providing an appropriate level of challenge, and acknowledging that students do not all work in the same way. Curriculum adjustment supports the stated educational goals of many countries (eg. The Adelaide Declaration on National Goals for Schooling in the 21st Century, as cited in Woodley, 2004); it reduces the risk of underachievement; it alleviates discipline problems and increases motivation; it addresses the different stages of readiness of different learners, and it builds self esteem through the provision of success for all students (Heacox, 2002).

Curriculum adjustment can cover such strategies as:

- adjusting the instructional group (for example, from whole class to small group to individual instruction);
- varying the setting (for example, providing a quiet position with few distractions for a student who has attention problems),
- adjusting teacher expectations (such as expecting several pages from some students, one page from others, and even a “fill in the blanks” exercise from a student with great literacy problems);
- adjusting assessment by allowing some students to be assessed in alternate ways, perhaps by talking to a topic rather than writing about it, or by having more time to complete a test paper (Scott, Vitale & Masten, 1998);
- modifying text by simplifying language and vocabulary, shortening sentences, etc.

This paper, however, will focus on strategies that you can use at the whole class level: strategies that will not limit what students with learning difficulties can access, but will allow these students to participate more fully in the regular curriculum. These strategies are based around the reading of text materials, because it is reading of grade-relevant material that so many students find difficult, and which results in the greatest frustration and the greatest potential for failure. Suggested strategies are divided into three groups: those that can be used prior to reading; those used during reading; and those used after reading, although some can be used in all three. The aim of these strategies is to increase the students’ engagement with the text; to give them a motivating purpose to read; and to provide scaffolding and support throughout the reading process. (Examples used in this section are drawn from Konza, 2003).

Strategies to Use Prior to Reading
There are many strategies you can use to prepare students for what they will meet in new text, to activate prior knowledge, to stimulate their interest, and to focus their attention.

Preview the Material to be Read
With the students, discuss the headings, subheadings and any key words that may be in bold type in the text material. Identify what the students already know about the topic. This provides a scaffold for the students for new information. When beginning a new unit of work, introduce new terminology first, explaining the term, and contextualizing it within its new framework. This is particularly important if it is a new meaning for a familiar term, such as the specialised meaning of the word “positive” in a unit on electricity.

Interesting Words Chart
These can be used to pre-teach vocabulary that will be met within the text or, alternatively, to study new words after reading.

- The teacher lists new words the student will meet in the text and the number of the page they first appear;
- students write their own idea if it can be worked out through context or use of prefixes, suffixes, etc;
- if necessary, a dictionary can be used to check meaning, and if there are multiple meanings, discussion can occur about which meaning the word has in this context.

<table>
<thead>
<tr>
<th>Word</th>
<th>Page Number</th>
<th>My Idea</th>
<th>Meaning in this subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force</td>
<td>2</td>
<td>Something strong</td>
<td>Strength or power</td>
</tr>
<tr>
<td>Positive</td>
<td>11</td>
<td>Sure, yes</td>
<td>A lack of electrons in an atom</td>
</tr>
</tbody>
</table>

Use Before and After Charts
Divide a page into two columns with the first being column narrower than the second. Head the first column “Before” and the second column “After”. In the first column, ask students to write down what they already know about the subject. This provides information to you as the teacher, and also provides a framework or
scaffold for new knowledge. In the second column, students gradually add important pieces of new information as they come across them in the text.

### POLLUTION

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke makes the air dirty</td>
<td>Cars give out exhaust fumes that pollute the air.</td>
</tr>
<tr>
<td></td>
<td>Burning wood fires makes our air dirty</td>
</tr>
<tr>
<td>Dropping litter spoils parks</td>
<td>Litter washes into storm drains and into the ocean</td>
</tr>
<tr>
<td>Smoke makes the air smell bad</td>
<td>Factories sometimes illegally send pollution into the air</td>
</tr>
<tr>
<td></td>
<td>Noise pollution means things are too loud</td>
</tr>
<tr>
<td></td>
<td>Too much loud noise can permanently affect a person’s hearing</td>
</tr>
</tbody>
</table>

**KWL (What I Know, What I Want to Know, What I Learned) (Ogle, 1986)**

This strategy is particularly suitable for non-fiction or textbooks. It can be used as an individual, small group or class strategy. The class
- brainstorms information about a topic
- records what they already know in the first of three vertical columns
- writes down what they want to find out in the second column
- adds new information they have learned at the conclusion of the unit or topic.

This is similar to the FFF strategy described below.

**FFF (Folded File Folder) (devised by Lewin and cited in Shoemaker & Dimino, 2002)**

This has been found to be a motivating and useful way for to record and organise new information. The procedure is:
- teacher distributes coloured A4 sheets
- students fold sheets almost in half, leaving a 2cm tab at the top
- students write the topic heading on the tab
- students then open up the paper and record what they know about the subject. This can be done in columns if the information has already been categorised in a brainstorming session or if subtopics have been identified

**Strategies to Use During Reading**

There are also strategies that can be used to help students monitor what they are reading, focus on relevant parts of the text, activate their prior knowledge, and integrate new and existing information. Some of the following strategies can also help students to evaluate the content they are reading, monitor their predictions, and draw conclusions. These strategies can help students with learning difficulties learn skills that most students develop with very little extra support.

**Stop and Think**

There is convincing evidence that this strategy is effective in enhancing the comprehension skills of individuals with reading disabilities (Griffey et al, 1988; Wong, 1983). The procedure is:
- teacher or class reads paragraph
- teacher stops and encourages class to either
  - talk about what they have just read
  - paraphrase it
  - identify the main ideas
  - generate questions
  - relate the information to personal experience
Check the Text
Moving from diagrams to text can help students record information in accessible language. The procedure is:
• in pairs, students interpret pictures or diagrams by writing their own text to accompany them
• interpretation is then be compared with the original text version.

Click and clunk (Klinger & Vaughn, 1999)
When we understand something, we sometimes say it has “clicked”. When children are reading material that they understand, they may be seen to be “clicking” along. When they come to a word that they don’t understand, they stop with a “clunk”. This strategy is used to help children with those bits that clunk. When this occurs, they use the following strategies:
• reread the sentence carefully
• think about what might make sense
• reread the sentence before and after to see if they will help
• look for a prefix or suffix that might help
• look for smaller words inside the unknown word that you may know.

Reciprocal Teaching (Palinscar & Brown, 1987)
Reciprocal teaching has been shown in many studies to help children from Year 1 to senior secondary school improve their comprehension (Palinscar & Brown, 1987). Reciprocal teaching involves the following steps:
• within a small group, readers read silently or aloud
• the teacher begins to ask questions, usually after the first paragraph. Questions relate to what has happened, who or what the text is about, what might happen next, the meaning of particular words, and so on
• when children answer, the teacher encourages and responds appropriately
• constant feedback is given between the leader and the student.
• before continuing to read, the teacher summarises what has happened so far and important points are noted down.
• a student is then invited to be the “teacher” and to guide the discussion in generating questions, making predictions, summarising and clarifying.
• students take turns at being the leader after each paragraph (or whatever portion of the text is appropriate).

Make connections (Harvey and Goudvis, 1999)
As students read, they use sticky notelets, stick-on flags or arrows (“stickies) on the text that monitor their understanding of the material. Stickies are big enough for brief comments, questions marks, exclamation marks, and anything that indicates some interaction with the text. Stickies may:
• indicate a connection between what they are reading and
  - a personal experience
  - another text
  - the world at large
• identify information or a story development that surprised them;
• point out something they want to ask about
• highlight new information.

Question Webs
Question webs operate like a concept map but involve a core question that a class group may be studying. Processes involve:
• teacher or student posing a question in the middle of a page
• lines emanating from the question are used to add information that students discover as they read and/or research the topic
• by the end of the text, there should be enough information to answer the question.
**Jigsaw Reading**
This activity works well if the same topic is being examined from different points of view (such as an early sea journey to Australia from the perspectives of the ship's captain, a crew member, and a transported convict); if the same material is being covered by different text types (for example, a newspaper report, an eye witness account, a police report, and the victim account of a crime) or with a topic that has discrete elements, such as tracking a primary product from planting to manufacture. The procedure is:
- groups of four or five are formed
- students in each group study material about a particular section of the topic
- groups are reallocated so that every group contains one member of each original group
- each student then takes turns in the new group to teach the information learnt in the original group
- each member takes notes on the new information
- class discusses key points from the material
Thus each group forms an essential part of the complete jigsaw.

**Strategies to Use During Reading**
Once the text material has been read, teachers can further help students to identify the main idea; identify critical information; summarise and remember key information; remember a sequence of events; understand relationships and connections; and stimulate the asking and answering of questions.

**Key Words**
The identification of key words is critical in understanding text. Key words must be specific enough to be meaningful and must also trigger the memory for recall of additional facts. Successfully identifying key words can be taught as a class or group activity, where the function of key words (as telling who, what where, when, how or why) is explained and then the students all try to identify key words in a sentence. Students then compare and justify their choice of key words. This activity is very useful when a less skilled reader is placed with more skilled readers who can model their cognitive processing through this task.

The desert **locust** is a highly **destructive** and widely feared **species** that **reproduces** very quickly and **migrates** in enormous **swarms** in search of food.

**Summarising Strategies**
**Note taking**
Note taking is a key summarising strategy. Students may take notes for different reasons. Notes can be used to help students understand text material; or to remember it, or to use it for an assignment. In order to take meaningful notes, students must be able to identify key words. They should also understand that note taking can take many different forms and that they should experiment until they find a way that really suits them.

The following sequence is a useful way to teach note taking. Give children enough practice of each activity for them to be competent before moving on. Procedure is:
- students record one word (the key word) about a simple high stimulus picture
- write the main idea in a sentence, using the key word
- write down some other words that are prompted by the picture
- use each of these words in separate sentences
move to text. Students read a simple paragraph, list key words, and then write a sentence using the key words without looking at the text
• ask a question about the text, scan to find the answer and write your answer in a sentence without looking at the text
• read text and record important words. Remove text and rewrite information into sentences.

Get the Gist
This activity helps note-taking skills. Procedure is:
• read some text. Determine the who or what the book or section was about.
• state the most important thing about the who or what in a maximum of 10 words (the who or what counts as only one word, even if it is more, ie, the who may be “early settlers in Australia”.)
• write this down – this is the gist of that section in a compact sentence.

Sequencing a Narrative
This activity is useful for helping younger students remember the sequence of a narrative. The procedure is as follows:
• the teacher identifies the key events in the story and writes them out in sentences or brief paragraphs. There is an added advantage if the total summary is one page long
• on the back of the summary, photocopy a picture from the cover or title page of the book. (You may need to enlarge the picture first. If you laminate this double-sided page, you will have a resource that can be used many times.)
• then cut the page up so that the sentences or paragraphs are separated and place them in an envelope. This activity can be placed inside the book
• after reading the book, the student reassembles the story in the correct sequence.
• when the sentences are turned over, the correct sequence will result in the picture from the story.

Using Graphics or Pictorial Forms
Information presented in graphic or pictorial form has been demonstrated in many studies to improve children's ability to recall and comprehend information within a text (Fowler & Davis, 1985; Idol, 1987).

Skeleton Outlines
Skeleton outlines may also be used during reading of a text and provide a useful way of organising important information. A skeleton outline involves:
• a heading at the top
• subheading in boxes emanating from the heading
• further detail in boxes attached to each sub-section.

It is important that the outline shows relationships between words or concepts and is not just a series of words, although these relationships may only be built up gradually.
Pyramids
Pyramids are also useful in recording and organising information. Detailed information is recorded on cards, which form the bottom section of the pyramid. This information is sorted into larger groups or categories that form the next and smaller section of the pyramid. The end result is a pyramid divided into:

- a main heading
- sub-headings
- supporting details.

The whole pyramid should then contain the main idea, broad categories and details of the text in an organised and easily remembered diagram.

Retrieval Charts
Retrieval charts are useful for summarizing information for comparison across a number of characteristics. The teacher provides the headings as a pre-reading or advance-organising activity and the students complete the grid after reading.

<table>
<thead>
<tr>
<th>Environments</th>
<th>Location</th>
<th>Climate</th>
<th>Flora</th>
<th>Fauna</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savannah</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tundra</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desert</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rainforest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Flow Charts
Flow charts help students understand information that is best understood in terms of a sequence. The procedure is:

- key elements of the sequence are identified and recorded
- elements are placed in order and connected by arrows.

Semantic Grids
This strategy helps students match a set of characteristics with different objects or concepts. The teacher provides the grid with concepts on one axis and the characteristics along the other. Children tick off the grid where appropriate.
<table>
<thead>
<tr>
<th>FOOD</th>
<th>high fat</th>
<th>high salt</th>
<th>high carbohydrate</th>
<th>high sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grains</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk Products</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit/Veg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cakes, sweets</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Story Maps (Beck, 1984)**

Story parts are organised into components such as the setting, the problem, the goal, action and the outcome (Idol, 1987). Story maps can even be pictures that illustrate important settings from the story and the movements of the main characters.

**Student Quiz**

After reading a story or factual text, students can make up their own questions based on the material and record the questions on small cards. These can be placed in an envelope for the next reader to use.

<table>
<thead>
<tr>
<th>CHARACTERS</th>
<th>TIME</th>
<th>PLACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE PROBLEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THE GOAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THE ACTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THE OUTCOME</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Change the Form**

This strategy requires the student to integrate information and change it into another form. Variations include:

- text from a diary could become a time-line
- a recipe could become a flow chart
- a description of a character could become a portrait
- an event in a narrative could become a newspaper report
- descriptive text could become a labelled picture.

**COMPUTERS**

A computer is a machine which lets people work with and save complicated information very quickly.

The basic system has a main unit, a keyboard and a mouse. The main unit contains the processor, memory, the built-in disk drive and the screen. The processor does the actual work of the computer. Memory is where the computer stores the information which is currently being used. The computer can get this information from a disk in the disk drive.

Information is put into the computer by a person typing on the keyboard. He or she can save the information by clicking the mouse or pressing keys on the keyboard. The screen shows the information which has been put into the computer. The parts of the computer that you can see and touch are called hardware.
Facts - Questions - Comments (Player and Miller 1993)

This strategy can be used with text but has also been successfully used with an object, artefact or picture related to a unit of work. The procedure is:

- class is divided into groups of 3-4.
- students read a piece of text, or examine the artifact or picture. Each group may have different items related to the same topic.
- in small groups, students write down ten points on their recording sheet. These points should consist of:
  - four facts
  - three questions
  - three comments
- each group then reports back to their class, using their points to start a discussion.

The ratio of facts, questions and comments can be determined by the teacher and can be altered for different groups.

<table>
<thead>
<tr>
<th>FACTS - QUESTIONS - COMMENTS</th>
<th>ROCK SAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Very hard</td>
<td></td>
</tr>
<tr>
<td>2. Blue/grey colouring</td>
<td></td>
</tr>
<tr>
<td>3. Able to scratch glass</td>
<td></td>
</tr>
<tr>
<td>4. Igneous rock</td>
<td></td>
</tr>
<tr>
<td>5. Is this type of rock found in the local area?</td>
<td></td>
</tr>
<tr>
<td>6. What can rocks of this type be used for?</td>
<td></td>
</tr>
<tr>
<td>7. What minerals can be found in this rock type?</td>
<td></td>
</tr>
<tr>
<td>8. The rock is not very heavy for its size.</td>
<td></td>
</tr>
<tr>
<td>9. There are many sharp angles.</td>
<td></td>
</tr>
<tr>
<td>10. The rough part feels like sandpaper.</td>
<td></td>
</tr>
</tbody>
</table>

Three Level Guide

A three level guide is one of the most useful whole class strategies when there are students with a wide range of reading abilities present. Students should work in mixed ability groups. The procedure is:

- using a class text, the teacher writes out a series of statements about the text, which cover three different levels:
  - the literal level, based on actual text content
  - the interpretive level, which should help students draw inferences from the text
  - the applied or evaluative level, which should be based on major concepts and generalisations.
- a copy of the statement is distributed to each group (One copy between two at the most ensures the smooth running of this activity.)
- teacher also distributes a chart like that below, which explains the different types of statement
- working in groups, students discuss each statement, deciding whether statement is literal, interpretive or applied
- when they agree on which statement type each is, the sentence is ticked off.

<table>
<thead>
<tr>
<th>Level 1 - Literal (Right There)</th>
<th>Visible and explicitly cued by the language of the text.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Draws on vocabulary, main ideas, supporting details, sequences ...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2 - Interpretive (Think and Search)</th>
<th>Not visible by still based on the language of the text.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Responses use the learners' background knowledge.</td>
</tr>
<tr>
<td></td>
<td>Draws on conclusions, comparisons, tone, inferences, irony ...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3 - Application (On Your Own)</th>
<th>Responses result from extending, refining and using assimilated new understandings and</th>
</tr>
</thead>
</table>
Being part of a discussion with students with a broad range of abilities assists the student with comprehension difficulties to paraphrase text, to summarise conclusions and to infer beyond the text, as these skills are modelled for them.

**Questioning Techniques**

Questioning strategies are appropriate at all stages of the reading process and are implicit in many of the techniques already discussed. The following questioning techniques are also useful in developing reading comprehension.

**Ask a Friend**

Encourage students to generate questions they could ask a friend who was also reading the material. If reading a class book, the questions could be placed in an envelope and put in the book for the next reader.

**Ask WH Questions**

Students ask questions relating to who, what, when, where and why while reading.

**Conclusion**

Students with learning difficulties have the right to participate in all classroom activities that are meaningful for them. The strategies mentioned above are useful whole class strategies that will assist the inclusion of students with a full range of abilities, promote cooperation and shared learning, and assist students to overcome the literacy hurdle that many students with learning difficulties face.

**References**


