Professional Development

Unit 5: Special Education

Special Education

Student Support Material

Special Education Student Support Material

The Special Education Student Support Material is designed to support Professional Development Unit 5 Special Education Modules 1 and 2. It is also intended to serve as a reference for teachers as they encounter special educational needs in primary classes.

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Materials written by John August, Heribert Eato, Rick Frost, Hans Gapog, John Hulum, Arnold Koima, Augustine Koroma, Donna Mailil, John Pokana, Kitione Ravulo, Vengal Vangun, David Wengip, Dika Peruka

Materials compiled and edited by Rick Frost
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Contents

Special Education

What is special education?
Special education is:

- Adapting or designing teaching and learning strategies for individuals with disabilities or learning difficulties,
- Understanding students' needs (disabilities, learning difficulties)

Effective teachers don't blame their students for not learning and they don't exclude students who don't learn well. They `blame' their instruction and try to alter it so that it works better. This kind of positive attitude is an essential part of special education and is the path to success for all students and their teachers:

All of my students will learn when I find the right way to teach them

Who is special education for?
Special education is for:

- Any student experiencing any kind of difficulty with learning
- Students with a particular disability, such as a hearing impairment, a vision impairment, a speech impairment, a physical impairment, or intellectual disability
- Students with behaviour disorders, emotional problems or a medical condition of one kind or another
- Students with a temporary or permanent disability or other special need

Any student can have a special educational need at some time or another, and any student can develop a special need. This is why it is sometimes said that *special education is for all students*.

How many students need special education?
It can be difficult to work out how many students in a community have special educational needs. Often, `assessment' at home is very different to assessment at school. Consider the examples of Giwi and Embosa:

Giwi

Giwi lives in the northeast of Papua New Guinea. His village is a fishing village and all the men and boys in the village hunt for fish each morning and evening. Giwi's family also carve canoes and Giwi helps his father and his elder brother with fishing and canoe-carving whenever he is not at school. Giwi has earned a reputation for being a good fisherman and he is also learning to carve very well. Giwi likes school because he has some good friends from other villages that he only sees at school. However, now that Giwi is in Grade 4, his inability to read, and to understand mathematics problems and some other school activities, is causing real problems for him. Giwi's teacher arranged for him to be assessed at a special education resource centre and it was found that Giwi has a mild intellectual disability and a mild hearing impairment as well. Giwi's teacher reported these findings to his parents who were very upset to find that their child had a disability. They said to the teacher that they had always been proud of Giwi and that other parents had told them how lucky they were to have such a good boy. They said that now they felt sad and ashamed.

Embosa

Embosa is doing very well in her studies in Grade 3 at school. Embosa's teacher is very proud of how well Embosa is doing. Embosa's parents are now very glad that they enrolled Embosa in school. Embosa has a form of paralysis in one arm and one leg, which makes housework and gardening very difficult for her. Embosa's parents were always proud of their daughter because she is a cheerful and kind person and she is also clever at drawing and making patterns but they were worried that she might have trouble earning a living and finding a husband when she grows up. Some other people in Embosa's settlement are sympathetic towards Embosa and her parents and also shared the parents' concern about Embosa's future. Now that Embosa has been at school for two years and is doing so well, Embosa's parents think that she might have a good chance of earning a good living in the future, so they are not as worried as they were. Embosa's teacher says that there are a lot of other children in Embosa's class that don't have disabilities but need a lot more of her help!

In the community, Embosa is regarded as having special needs but Giwi is not. At school, it is the other way around. Definitions of disability and special needs vary according to the context and, often, the attitudes of parents, teachers, other students, community members and the students themselves.

It is only possible to estimate very roughly the number of students with special needs in Papua New Guinea schools:

- Most students with more severe disabilities do not attend school (NDOE, 1993)
- There is a high proportion of students with hearing impairment in PNG (up to 50% with permanent or temporary loss) (NDOE, 1993) due to cultural practices (*i.e.*, sniffing rather than nose-blowing), environmental characteristics (*i.e.*, the many rivers and areas of swamp used for bathing; the remoteness of many areas from clinical services) and socio-economic factors (*i.e.*, shortage of clinical services; some hygiene practices; costs of medical services and supplies).
- 10-15% of students probably have learning difficulties at school
- There are significant numbers of students with vision impairment, blindness, deafness, physical disabilities or serious medical conditions in PNG communities and schools. Less than 1% of any school population would usually have these disabilities.
- 2-5% of students probably have mild or moderate intellectual disabilities

Beware of Categories

It is easy to get the impression when reading most special education textbooks that all of the students with one type of disability are very similar to each other and need the same sort of things. Nothing could be further from the truth! While deaf students, for example, all need some of the same things, they are all very different from each other. Their ability differs, they have different personalities and backgrounds, and they have different interests. They are just as different from each other as all other children are from each other. This is true of all students with disabilities; they are different from each other and they all have different needs. Only some needs will ever be similar. Teachers must beware of placing students in disability or difficulty categories. In most cases, categories are misleading and unhelpful. Students with disabilities should always be treated as individuals with their own, unique characteristics.

What terms should be used to describe people with special needs?
Advocacy groups, and others representing people with disabilities in recent years, have asked that professionals, the media and schools discontinue the use of disability terminology that devalues people with disabilities. People with disabilities do not wish to be known as `a Down syndrome person' or `the handicapped', or by any such term. They wish to be recognized as valued members of society, that is, people, who have a disability. People with disabilities therefore prefer terms such as:

a person with a disability	people with disabilities
the child with cerebral palsy	Sione has a physical disability
Do you have a hearing impairment?	

The principle to be followed is *people first, disability second* (Foreman, 2000).

People with disabilities do not wish to be seen as the object of a punishment or blight, or as victims, either. Nor do they wish to be seen as continually suffering or in need of sympathy. They don't like terms such as `suffers from', `afflicted with', `physical problem', etc. They prefer their disability to be referred to as something that they just *have*. Foreman (2000, p. 21) provides a list of suggested terms:

Use of language when talking about disability

Avoid expressions such as …	Use …
the cerebral palsied	people with cerebral palsy
the deaf	people who are deaf
spina bifida children	children with spina bifida
epileptics	people with epilepsy
the handicapped	people with disabilities
his handicap is …	his disability is …
the disabled	people with disabilities
a blind man	a man who is blind
a victim of blindness	a man who is blind
mental retardation	intellectual disability
the retarded	people with intellectual disability
the intellectually disabled	people with intellectual disability
he is crippled	he has a physical disability
he suffers from Down syndrome	he has Down syndrome
she is wheelchair bound	she uses a wheelchair
he had a fit when I told him	he was angry when I told him
my deaf sister	my sister
spina bifida people and normal people	people with and without spina bifida

The World Health Organization (1980) determined the following definitions, which have been generally accepted throughout the world:

impairment	an abnormality in the way organs or systems function *e.g., a medical condition, eye disease, a heart problem*
disability	the functional consequence of an impairment *e.g., an intellectual disability due to brain impairment; low vision; deafness*

handicap	the social or environmental consequence of a disability *e.g., a person with a wheelchair is not handicapped when paths and buildings are wheelchair accessible*

In writing and speaking about, and with, people with disabilities, whether they are young or old, it is most important to use appropriate terminology. Firstly, it demonstrates to all that we *value* people with disabilities as members of our society. Secondly, it *educates* those who read and hear what we say, about appropriate terminology, and therefore gives them an opportunity too, to help develop and promote positive, inclusive and equitable values.

Special education – Beliefs and Attitudes

Understanding the relationship between traditional and modern beliefs about why some individuals in our community have some forms of disability or learning difficulties assists teachers in their work with students, parents and their school communities. Teachers need to have positive attitudes towards students with special needs if they are to be effective in working with these students.

What beliefs affect special education?

There are three main influences on community beliefs about disability in contemporary PNG:

Traditional Beliefs

In many South Pacific countries a child's disability has been associated with the parents breaking a traditional *tabu*, upsetting local spirits by harming the land or committing an unacceptable act, or not living up to all their responsibilities and obligations. Disability has often been regarded as the consequence of a curse, spell or other magic (*puri puri*).

Christian Beliefs

The Bible makes few references to causes of disability but some people have interpreted verses such as those in Deuteronomy 28:*…if thou wilt not hearken unto the voice of the Lord thy God…cursed shall be the fruit of thy body…*as an indication that disability can be a punishment for a parent's misbehaviour. Other passages, however, seem to contradict this notion, *e.g., the son will not share the guilt of the father, nor will the father share the guilt of the son. The righteousness of the righteous man will be credited to him, and the wickedness of the wicked will be charged against him (Ezekiel 18).*

Contemporary Beliefs

Medical research has explained many of the causes of most of the known disabilities while educational researchers are continually finding new information about the social, educational and other non-medical causes of apparent disabilities, learning difficulties, behavioural and emotional disorders, and so on. Much remains unknown and it remains the case that many children are born with disabilities or develop disabilities of which the cause is unknown, but, generally speaking, new findings from medical and social science research fields are rapidly replacing traditional views of causes and treatments of disabilities. New methods of treating and responding to special needs are continually emerging as well, from the fields of medicine, social science and education, with a high degree of success, and new technologies are also rapidly changing the ways in which many people with disabilities are able to interact with the world.

What are the consequences of different beliefs about special needs?

Sometimes when a child is born with a disability, community members can be quick to identify some wrong previously committed by parents, or others, in an effort to explain the appearance of the disability. Such beliefs can lead to blame being cast against parents or others, ill feeling developing within and among communities, and embarrassment on the part of the parents. This

kind of situation has sometimes led to children with disabilities in PNG communities being hidden away, denied access to regular village or community life, and denied an education.

When parents and communities are informed of medical explanations for disabilities, or when it can be shown that a child's behaviour or performance can be explained by particular socioeconomic or educational circumstances, their feelings about the child or the parents can be very different to those they might have traditionally held. Many communities in PNG are trying to come to terms with the clash of traditional, religious and scientific information and attitudes.

Benjamin

Benjamin was born with a deteriorating form of physical disability in a village in Morobe Province. During his early years, he was able to move around without any assistance but after some years, he lost his ability to walk. After much talk among community members it was found that Benjamin's father had committed adultery with another woman of the same village. Benjamin's mother was hurt and contemplated divorcing her husband. Community members believed that if Benjamin's father confessed his sins, Benjamin would be able to walk again and reconciliation of the family might also be achieved. Benjamin's father did confess and asked forgiveness from his wife. Benjamin's condition did not improve after his mother accepted his father's confession, though, and his disability continued to deteriorate. Benjamin's parents developed a stronger relationship and it was said in the village that it was their love for their child in his remaining years that brought them closer together.

How does attitude differ from belief?

Attitudes are, to a large extent, a reflection of a person's fundamental beliefs. To understand and appreciate a person's attitudes (and even one's own attitudes) a teacher often needs to understand or identify that person's beliefs. Special education, to a large extent, is all about attitudes and *attitudinal change*. Many authors, and many practitioners, say that the single most important factor that determines whether or not inclusive education works for students, is attitude. Usually, this means the attitude of the teacher, but the attitudes of parents, students, principals and colleague teachers are also very important and can `make or break' inclusive education. Sometimes, in order to bring about a successful model of inclusive education, teachers need to change the attitudes of others or change their own attitudes.

How does attitude affect special education?

In most highly developed countries, much of the debate in special education is about segregated models of special education (*i.e.*, special schools and special classes) versus integrated or inclusive special education. The attitudes of teachers, parents, students, principals and so on, are a most important factor in this debate and often influence the effectiveness of the various approaches. In Papua New Guinea, transport and communication factors, costs, attention to the international directions of special education and a fundamental philosophy supporting equity of education for all within the administration of the national Department of Education, have resulted in inclusive education becoming the preferred (and probably the only practical) model of special education nationally. Consequently, the issue in Papua New Guinea communities is not whether a child with a disability should attend a special school or class, or a regular school, but, rather, whether the child can go to school at all, and for how long the child should attend school (*i.e.*, should the child proceed to upper primary, secondary, and so on). At the school, the issue is *should this child be at school* and *how can this child be managed at school.* This means that the attitudes of parents, teachers and students themselves have a very great impact on whether or not special education can or cannot be implemented.

Nevertheless, teachers with a positive attitude are usually the most successful teachers and often the most influential teachers. It is teachers with this kind of attitude that make special education work.

How can attitudes be influenced?
For teachers to fulfil their responsibility in making sure that students with special educational needs receive a proper education, they often need to become involved in attitude change. They may need to change their own attitude. They will often be involved in changing the attitudes of others; colleagues, principals, parents and students. Effective teachers are usually *agents of change.*

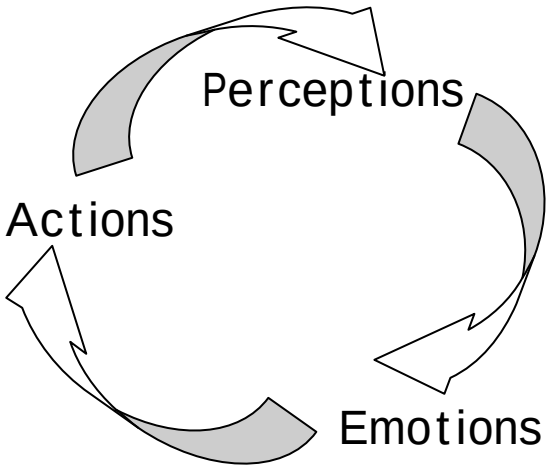
Changing attitudes isn't always easy, although many teachers have changed attitudes simply by demonstrating new or better practices. *Practicing what you preach* can be the most effective strategy of all for changing attitudes. This often works to change teachers' own attitudes! Teachers who actually try out inclusive special education strategies often find that the strategies actually work, and this experience changes their whole view of what can be done and what can be achieved.

Attitude can be thought of as having three components:

- Perceptions *The way people see things; the information they have about something; beliefs; facts; assumptions; interpretations; experiences; understanding*
- Emotions *The way people feel about something; commitment; subjectivity*
- Actions *The way that people act, based on their perceptions and emotions; what people do according to their attitude*

Each component of attitude affects the other components. A person's perceptions affect their emotions (the way they feel), and their feelings influence the actions they take.

A Cycle of Attitude Change



Changing *perceptions* is probably the most important strategy in changing attitudes about disabilities and other special needs. Informing people about actual causes of disability, demonstrating what can be achieved, demonstrating and explaining the benefits of inclusive special education, and so on, can make a huge difference to people's attitudes.

Emotions about students with special needs vary greatly. Some teachers feel uncomfortable working with students with disabilities, while some have very positive emotions. Some teachers, and parents, have very caring emotions but are *over-protective* and can actually limit the achievements and opportunities of students with special needs by not exposing them to the hazards and risks of normal life. Changing a person's feelings usually involves changing the person's perceptions but exposing the person to the feelings of others encourages the person to have empathy, that is, they can begin to see how others feel, and can see themselves *in their shoes.* For example, when a teacher or parent sees the positive feelings of a child with a disability succeeding at school, playing with other children, and so on, they begin to appreciate how important it is for that child to have those opportunities.

Actions are the most important component of attitude because it is actions that make the difference and it is through actions that perceptions are changed. As mentioned above, people can change their own perceptions and emotions by trying things out, and changing the attitudes of others can be achieved very quickly by demonstration, or by *walking the talk* (actually doing what you say should be done).

What is advocacy?

One of the most important changes occurring in Papua New Guinea society and schools is the opening up of opportunities for children and adults with disabilities and other special needs. In most communities of PNG, people with disabilities have been cared for and valued, but they have not been given access to the same opportunities as people without disabilities. As Papua New Guinea society continues to develop and evolve, teachers have an important role to play as *advocates* for children with special needs; they make sure that students with disabilities attend school and receive an excellent education at school, and are treated properly by others.

Disabilities – Types, Causes, Prevention & Approaches

Teachers in Papua New Guinea have an important role to play in teaching students with special educational needs, accessing special education support services, accessing medical or clinical services, and even providing some medical and therapy services. Teachers also have an important role to play in educating students and their communities about strategies that can prevent students from becoming disabled or more disabled.

Why do teachers need to understand disability types, causes and prevention?

As a general rule, teachers do not need to know a whole lot of information about disability types. They do, however, need to be able to recognize what kind of disability a student may have and how to identify students with less obvious disabilities.

> *Probably the most widely-held myth about teaching students with a disability is the belief that a detailed knowledge of the child's disability is needed before a teaching program can be commenced. Teachers often say `But I know nothing about Down syndrome' or `I haven't studied cerebral palsy – how could I teach that child?' Another myth is that teachers need special patience and special skills to be able to teach children with disabilities. Research suggests that good general teaching skills and techniques are what are required to teach students with disabilities.* (Foreman, 2001, p.25)

What types of disabilities are there?

There are eight major areas of special need that teachers are likely to come across in Papua New Guinea schools:

- learning difficulties
- intellectual disability
- physical disability

- hearing impairment
- speech impairment
- vision impairment
- behavioural and emotional disorders
-

Some students have a number of disabilities or other special needs. Sometimes, this is a coincidence but it can also be the case that a particular disease or condition has caused a number of disabilities (*e.g.*, a student with cerebral palsy might have a physical disability, a speech impairment and intellectual disability (although many people with cerebral palsy do not have an intellectual disability)) or it can be that one disability has caused another (*e.g.*, a student with a severe hearing impairment may have learning difficulties because they haven't heard all the information they need to learn to read effectively).

Learning Difficulties

What are learning difficulties?

The students with special educational needs that teachers are most likely to come across in their classes are students with learning difficulties. These are students who do not necessarily have any disability but, for some reason, have difficulty with learning. Usually, these students have difficulty in only some areas of their learning, such as literacy, mathematics, and receptive language (understanding instructions or directions, following stories, and so on).

Learning difficulties (or learning disabilities) are not the same as intellectual disability. Students with learning difficulties have normal intelligence but students with intellectual disability have a level of intelligence that is significantly below the normal range. Teachers should expect that students with learning difficulties in one or two academic areas, such as literacy and mathematics, or literacy and language, will probably not experience difficulties in other curriculum areas. If students appear to experience difficulties with learning in most areas of school learning, they might actually have an intellectual disability or another more serious disability.

Students with learning difficulties are most likely to have difficulties in the following areas of school learning:

General Difficulties

- difficulties in understanding and following directions
- difficulties remembering things (short-term and long-term memory problems)
- a short attention span & being easily distracted
- being overactive or impulsive
- difficulties organizing work and time; difficulties `getting started'
- lack of confidence; reluctant to attempt difficult or new tasks
- difficulties with tasks that require rapid responses
- lack of effective learning strategies

Difficulties in Reading

Difficulties in reading are sometimes called *dyslexia* (which is a Latin word meaning *can't read*!) if reading is the only area that the student has difficulties with. Reading difficulties are by far the largest area of learning difficulties, with over 80% of students with learning difficulties having reading difficulties as their particular area of need (Vaughn *et al*, 2000).

Particular areas of need are likely to be:

- difficulties remembering sight words and patterns
- difficulties identifying the separate sounds in spoken words
- difficulties blending sounds
- confuses similar letters and words (*e.g.*, *b* and *d*; *man* and *name*)
- difficulties *decoding* words (*i.e.,* working out how written words sound, and meanings)

Difficulties in Mathematics
If mathematics is the only area of difficulty, this area of difficulty is sometimes (but rarely) called *dyscalculia* (meaning *can't do maths*!). Students with mathematics difficulties often have

- difficulty with counting and sorting groups of objects to match numbers
- difficulty remembering number facts (e.g., addition facts, times tables)
- difficulties with arithmetic operations.

Sometimes students develop difficulties in the early primary years but this is often a result of problems they are having with reading and comprehension. Understanding the *order* in equations, number sentences and so on, is also an area where students frequently experience difficulty.

Difficulties in Writing
Many children have difficulty forming letters, holding a pencil correctly, tracing shapes with fingers, recognizing shapes, copying from the blackboard, drawing, and so on. In many cases, this is the only particular difficulty that the student has. Teachers need to be careful not to assume that students with poor handwriting have other difficulties. Teachers also need to judge whether the student has difficulty *understanding* what or how to write, or physically forming the letters.

Related Difficulties
Students with learning difficulties sometimes have other difficulties that may be related to their learning difficulties or may be a consequence of their learning difficulties. Some of the frequently occurring difficulties are:

- low confidence and self-esteem
  Students with learning difficulties often have little confidence and may have a very poor opinion of themselves and their ability. Often students believe they are less capable than they really are.
- poor social relationships
  Students with learning difficulties can be socially isolated and can have difficulty making friends. This can be due to their lack of confidence and poor self-esteem.
- clumsiness, lack of coordination
  Some students with learning difficulties are also poorly coordinated, have difficulties with sports, games and other physical activities. Students who have poor coordination as well as learning difficulties are at high risk of having very low self-esteem.
- poor expressive skills
  Problems with memory and problems learning the more subtle skills of language, can often cause students to be poor communicators.

What causes learning difficulties?
There are a very large number of possible causes of learning difficulties and there are many different theories. In the case of individual students, it is very difficult to pinpoint the actual reason why a student is struggling at school. There are likely to be a number of reasons. Unfortunately, teachers, and parents too, usually look to some fault or defect with the student when a student experiences learning difficulties. They often look to theories about possible

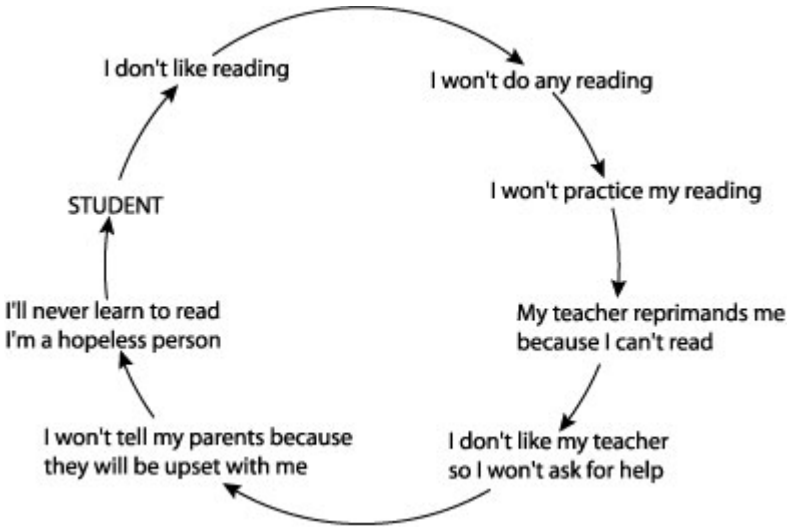
brain dysfunction, visual problems, hearing impairment, and so on. Some even look at such things as diet and body chemistry. Sometimes, there really is a vision or hearing impairment that can be corrected (*e.g.*, the student may need glasses, or have a hearing disease or ear blockage) but usually the underlying reasons remain unknown and untreatable. It is often more productive for teachers to focus on possible causes that can be `treated', such as:

- quality and type of instruction given
- teacher's expectations
- relevance of the schoolwork to the student
- classroom environment
- manner in which the teacher treats the student
- ways in which the student is treated by other students
- appropriateness of the curriculum

(Westwood, 1997, p. 9)

Some researchers have said that students with learning difficulties should be called *curriculum disabled* because they have found that poor quality curriculum and instruction can be such an important cause of learning difficulties (Elliott & Garnett, 1994; cited in Westwood, 1997, p.9). One of the major known causes of severe learning difficulties is a phenomenon known as *the failure cycle*. If a student experiences difficulty or failure early in their school life, they can lose confidence, avoid difficult learning tasks, avoid practicing their skills, avoid school altogether in some cases, and so accumulate a whole lot more reasons to struggle at school. The following diagram uses literacy to demonstrate this phenomenon:

A Failure Cycle



Adapted from Westwood, 1997, p. 10.

Effective teachers make sure that they find out which students are having difficulties and they try to respond to their needs as early as possible. Effective teachers do all they can to stop small problems becoming very big problems that are much harder to address. The longer the time that students experience difficulties at school, the greater the effort that is required to eliminate or reduce the problem.

How can learning difficulties be prevented and addressed?
Prevention of learning difficulties is all about providing the best teaching that a teacher can provide, so that students do not experience difficulties, and responding early to problems that do arise so that small problems do not become major problems.

Major considerations for teaching students with learning difficulties are:

- Use direct, explic it teaching to teach reading, writing, spelling and mathematics.
- Build up the confidence of students by starting with easy tasks that they can already do, move ahead gradually, introducing harder material very carefully.
- Monitor students' work regularly and carefully so that you know when students are experiencing difficulties and you can respond quickly.
- Teach skills in practical, meaningful ways, and use concrete materials frequently.
- Give plenty of attention to phonics and decoding strategies in reading, as well as plenty of attention to *phonemic awareness* skills (rhyming games, games involving swapping beginning sounds, ending sounds and middle sounds in words, clapping out the number of sounds and syllables in words). *However, if a student has a hearing impairment, place more emphasis on sight-word approaches to reading as students with a hearing impairment may not be able to hear some sounds in words, even at close range.*
- Provide plenty of practice and revision of skills and knowledge.
- Use peer tutors and parent helpers to provide extra instruction and practice.

Intellectual Disability

What is intellectual disability?
Intellectual disability is a substantial limitation in *cognitive functioning* (*i.e.*, thinking skills). Overall, people with intellectual disability usually have:

- limited communication skills
- limited self-care skills
- poor social skills
- difficulty with learning and require special teaching methods to learn efficiently

A person with mild intellectual disability usually has:

- severe learning difficulties
- a history of slow personal development.

Most people with mild intellectual disability learn independent living skills and are usually involved in productive work at home, in the community or in a workplace.

A person with moderate intellectual disability usually has:

- very severe learning difficulties
- very poor communication skills
- very slow personal development.

People with moderate intellectual disabilities do not usually learn all the living skills they need to live independently, without the support of family or other carers. However, people with moderate intellectual disabilities often learn some productive role in their home or village and some have been able to gain limited employment.

A person with a severe intellectual disability is usually not able to perform academic tasks, is unlikely to develop or learn self-care skills and may not learn or develop ordinary communication skills. Pictorial communication systems (using pictures to communicate) have been successful, in some cases, in teaching students with severe intellectual disabilities to

communicate choices and needs. People with severe intellectual disabilities do not learn to live independently and require ongoing support for their survival.

In the past, intellectual disability was called *mental retardation,* a term that continues to be used in some textbooks. People with intellectual disability have formed international associations aimed at eliminating discrimination against people with intellectual disability, and these organizations have asked governments and others to use the term *person with an intellectual disability* instead of *person who is mentally retarded*. For this reason, most authors nowadays use the term *person (or student, child, etc.) with an intellectual disability.*

What causes intellectual disability?

Intellectual disability is the result of damage to the brain. Damage to the brain can be a result of a developmental or genetic disorder (such as Down syndrome (*see Hall, 1994, pp.40-41*), a disease before or after birth, or a trauma before or after birth. In individual cases it is often not possible to identify the cause of intellectual disability. However, some known causes are:

Genetic conditions	Abnormalities in genes inherited from parents, errors when genes combine or damage to genes during or before pregnancy from disease, radiation or poisoning. Examples include Down syndrome and Fragile X syndrome.
Problems during pregnancy	Poisoning of the unborn baby from alcohol or other drugs; malnutrition; illnesses of the mother (*e.g.*, rubella, toxoplasmosis, venereal disease, HIV, cytomegalovirus)
Problems at birth	Prematurity; low birth weight; injury at birth due to complications
Problems after birth	Diseases such as whooping cough, chicken pox, measles, meningitis, malaria, encephalitis; head injury from accidents or abuse; oxygen deprivation from near-drowning; poisoning; ingestion of pollutants; malnutrition; high fever.

Some of these causes also cause other disabilities so some people have multiple disabilities. For example, students with Down syndrome usually have intellectual disability but often also have medical problems.

How can intellectual disability be prevented?

Preventative measures that parents and others can take to reduce the risk of intellectual disability include:

Before birth

- Avoid alcohol, smoking and other drugs
- Avoid HIV and other sexually transmitted diseases
- Have a good diet and a healthy lifestyle
- Obtain plenty of rest and avoid strain and overwork
- Seek medical assistance for any illness or infection

After birth

- Eliminate child abuse or neglect
- Avoid accidents and injury
- Obtain proper immunization against disease

- Avoid malaria
- Ensure that the child has a healthy diet and a healthy, active lifestyle
- Avoid dirty or polluted water
- Prevent infections by only using clean food and have good hygiene practices

How can teachers address intellectual disability?

The most important thing for teachers to understand about students with mild or moderate intellectual disabilities is that they will have serious learning difficulties and will not be able to access the whole school curriculum. Teachers need to discuss the student's needs with the student's parents, and work out some educational priorities for the student. The student's learning at school will be limited so the teacher must make sure that the educational objectives set for the student are important, achievable and useful. The teacher must also utilize peer tutors and others, if available, to assist the student with learning. The student's learning will occur gradually and the student will always have difficulty, so the teacher needs to teach skills in small steps using *task analysis* and make sure that all instruction is clear and direct.

Partial Participation

All of the material in the primary school curriculum is useful and important. However, only some material is absolutely essential for every student to learn. Students with intellectual disability cannot cover an entire curriculum so teachers, in collaboration with the student's parents, have to decide which curriculum outcomes to concentrate on and then focus on those only. While other students might be working on many curriculum outcomes at a time, a student with an intellectual disability will probably only be working towards three or four curriculum outcomes in a school term, and may only be working on one or two objectives on each school day. Students with intellectual disability, like all other students, need to be involved in regular school activities with other students but, unless the teacher has access to specialist assistance, the teacher will only be able to provide a limited amount of instruction to the student. Effective teachers make sure that students with intellectual disabilities are included in as many regular school activities as possible but they can only provide instruction on one or two objectives for each student with a disability each day.

Functional Curriculum

Because students with intellectual disability learn very slowly, what they learn should be *functional (i.e.,* useful in their daily lives). Functional skills are usually basic communication skills, self-care skills, personal safety, money management, survival reading skills, social skills and practical skills for making a living. Teachers should use real, practical materials for teaching functional skills, and, if possible, ensure that students practice their skills in real contexts. Parents can be a great help to teachers in this regard.

Make Learning Fun

Students with intellectual disabilities have as much right to be at school as any other child. To teach these students well, teachers have to treat them with dignity and respect, and make learning fun. Teachers should use plenty of encouragement, patience and praise to build up confidence and feelings of success. For young students, or students who aren't used to attending school, it is also important to make sure that the student is attentive. Setting up listening games and other listening activities, making sure that students are engaged with other students, and, overall, making the classroom an interesting and busy environment, is a good set of strategies to use to encourage attentiveness.

Task Analysis

Breaking tasks into smaller, teachable steps, is a very important and useful teaching strategy for students with intellectual disability. While a task may be too difficult for a student to learn, if it's broken down into smaller steps, the student may learn to do all of it or some of it gradually.

Most tasks can be broken down in this way. Students with intellectual disability need lots of repetition and practice before steps are truly learned and they also need to perform their learning tasks with different materials and in different contexts to generalize their skills. Teachers should always reinforce students' attempts and successes. Teachers need to monitor students' performances regularly and keep a record of progress. If an approach to teaching isn't resulting in any progress, then the teacher should find a different way to teach it. Remember, if the student isn't learning, then the teacher hasn't found the right way to teach that skill.

Peer Tutoring
In a big, busy, crowded classroom, a teacher cannot give any one student much more than a few minutes of individual instruction each day. While those few minutes are very important and useful, teachers should always use other students, parents and any other helpers to also help with students with disabilities. Students with intellectual disability learn best through regular, daily instruction and the instruction doesn't need to be lengthy. Peer tutors or other helpers can provide just a few extra minutes of instruction for the student each day, and make a very big difference to the student's rate of learning. Cooperative learning strategies are also an excellent way to include students with disabilities in learning and other school activities.

Physical Disabilities

What are physical disabilities?
Physical disabilities are any limitation on a person's ability to move about, use their limbs or hands or control their own movement. Physical disabilities are the most obvious disabilities, as a rule, although there are some conditions that limit movement and mobility in less obvious or inconsistent ways (*e.g.*, epilepsy, cystic fibrosis, diabetes). Students with more severe physical disabilities often have related health problems and, of course, physical disabilities are often a symptom of health problems. Physical disabilities most likely to be encountered in Papua New Guinea schools are:

Disability Due to Injury or Other Trauma
Accidents, natural disasters, abuse or neglect can cause children to have amputated limbs, impaired limbs or spinal column, or many other physical impairments. Burns victims, for example, often have a loss of mobility in hands or feet. At Aitape, following the devastating tsunami of 1998, there were many children who lost limbs or suffered such severe fractures and other injuries, that their limbs were amputated. Other children have lost limbs or suffered spinal injuries through bone infections (osteomyelitis) or other diseases, or complications following other injuries.

Children from the Sissano Lagoon area injured by the 1998 tsunami

Cerebral Palsy
Cerebral palsy is a form of brain damage that can cause a range of different physical disabilities, and, sometimes, intellectual disability. Cerebral palsy can result from the pregnant mother having an infection, rubella, shingles or diabetes, or from problems at birth in which the child is deprived of oxygen or suffers a head injury; prematurity; or problems after birth, such as a very high fever, a head injury, poisoning or a near drowning, a brain tumour or a circulatory problem. In many cases of cerebral palsy, the cause remains unknown. Cerebral palsy is one of the most common forms of physical disability. About 1 in 300 babies are born with or develop some form of cerebral palsy (Werner, 1987) but, in most cases, the symptoms are relatively mild.

The major types of cerebral palsy are:

Spasticity Very stiff muscles or high muscle tension. Some parts of the body are rigid so movement can be very awkward.

Athetosis Uncontrolled muscle movement. Parts of the body move uncontrollably and inconsistently. If the muscles needed for speech are affected, the child may have difficulty communicating, even though their intellectual ability may be normal.

Ataxia Poor balance and unusual clumsiness. The child with ataxia may have difficulty walking and may be teased by other children when clumsy, as children with ataxia may not obviously appear to have a disability.

Poliomyelitis
Polio is a common disease in many developing countries, and in some parts of Papua New Guinea. Although the disease is mild in most cases, it can cause permanent and severe paralysis of body parts, usually the legs or feet, in about 30% of cases. Polio can also be fatal if breathing or swallowing is affected. Polio is a virus, spread by breath, that infects the central nervous system. Immunization against polio is very effective, if it is available, but if a child already has polio, medication can make the condition much worse.

Epilepsy
Epileptic seizures (commonly called *fits*) are caused by brain damage or an abnormal brain condition. Brain injury causes about 30% of cases of epilepsy and many children with cerebral palsy also have epilepsy. High fever, dehydration, poisoning and meningitis can cause epilepsy but about 30% of cases of epilepsy are inherited. In many cases of epilepsy, no cause can be identified. Some children only ever have one or a few seizures but some other children develop chronic epilepsy. ***Seizures in young children can be a symptom of other serious disease so medical assistance should always be sought if a child has a seizure***.

Some children have major seizures that involve a loss of consciousness and strong uncontrolled movement. Other children have minor seizures that usually involve a short loss of consciousness; the child may fall down or just cease movement for an instant. Seizures are usually temporary and the child recovers fully, although the child may be tired and confused afterwards. In some cases, seizures can cause brain damage but this is usually only in cases where seizures are frequent and severe.

What To Do When a Child Has a Seizure:

- Learn to recognize any known warning signs (e.g., sudden fear or cry) and quickly move the child to a safe place, free of obstacles or hazards.
- Do not try to move the child if a major seizure has started.
- Remove any sharp objects or obstacles away from the child.
- Do not try to forcefully control the child's movements.
- Do not put anything in or near the child's mouth during a seizure.
- Between spasms, gently turn the child's head to the side to drain away any spit.
- Let the child rest or sleep after a seizure. Give the child paracetamol or aspirin if the child has a headache.

Spina Bifida

Spina bifida is a medical condition that develops in some children before birth. When the vertebrae of the spine do not properly enclose the spinal cord, a soft, unprotected area can be left, and the spinal cord can bulge through the skin. This `bag of nerves' looks like a dark bag and can leak fluid from the brain and spinal cord. The cause of spina bifida is unknown but about 1 in 1000 children are born with spina bifida (Vaughn *et al*, 2000, p. 267). It is not known how to prevent spina bifida although the effects of the condition can be reduced through surgery and good management. Spina bifida can be mild or severe and children with spina bifida are at high risk of developing other serious diseases, such as meningitis. Nowadays, most children born with spina bifida have surgery to correct the condition. Nevertheless, even when surgery has been performed to place the exposed nerves back within the spinal column, many children with spina bifida continue to experience the muscle weakness, continence problems and paralysis associated with spina bifida. Teachers should seek assistance from a health clinic or special education resource centre to help design any special equipment or medical advice that might be needed for a child with spina bifida.

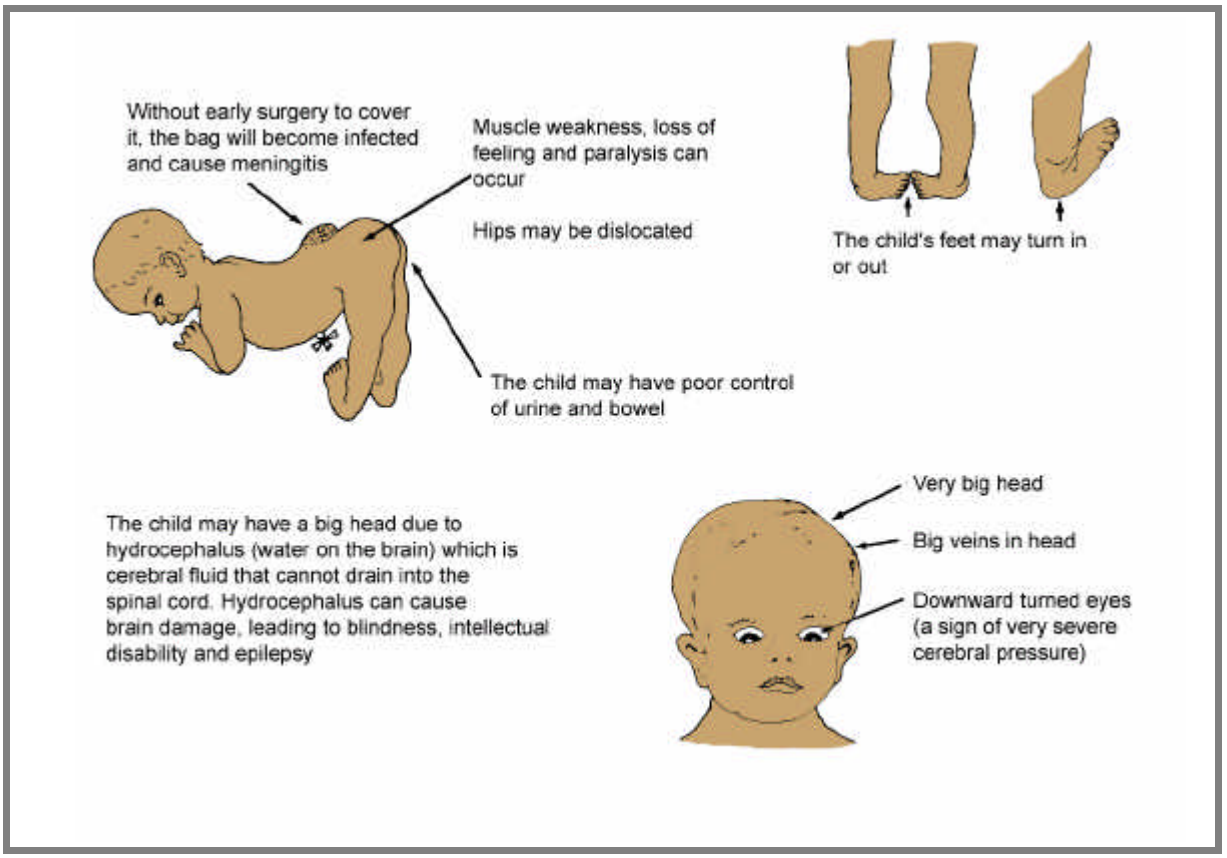
Birth Conditions

About 1 in 100 children are born with conditions such as cleft lip or cleft palate, joined fingers or toes, extra fingers or toes, or short or deformed limbs. More serious birth conditions include Down syndrome, cerebral palsy, spina bifida, blindness and deafness. In most cases, the cause of such birth conditions is not known but the following circumstances can cause them:

- Poor diet during early pregnancy
- Genetic causes (especially if parents are related)
- Exposure of the pregnant mother to some medicines, poisons, pesticides and other chemicals
- Exposure of the pregnant mother to German measles (rubella)
- Older or very young mothers are more likely to have babies with birth conditions such as Down syndrome

Some common birth conditions are:

- *Cleft lip and palate*
  A cleft lip (sometimes called a *hare lip*) is an opening or gap in the upper lip, often connected to the nose. A cleft palate is an opening in the roof of the mouth connecting with the canal of the nose. Cleft lips and palates can be corrected by surgery but even after surgery, children may continue to have some difficulty with speech. If surgery is not performed, the child may need to use sign language to help with communication.



Spina Bifida Symptoms *From Werner (1987, p. 167)*

- *Joined fingers or toes*
  Surgery can usually separate joined fingers or toes but teachers may need to encourage students to stretch the skin around areas where surgery has been performed, to help with flexibility and movement.

- *Incomplete or limbs*
  Children are sometimes born missing arms or legs, or with limbs that are very short or incomplete. Some medicines are known to have caused this kind of problem but often the cause is unknown. Children without arms can be taught to use their feet for many activities, such as eating, drawing and writing. Special aids can also be made to help children with missing limbs or with limbs that do not function fully.

Other Conditions

There are many other serious and minor medical and physical conditions that can affect children and that teachers may need to gain an understanding of. These include birth conditions such as:

cystic fibrosis
fetal alcohol syndrome
brittle bone syndrome (osteogenesis imperfecta)
dwarfism

or chronic diseases or conditions that children may contract or develop after birth, such as:

diabetes
HIV/AIDS

cancer
asthma
juvenile arthritis
muscular dystrophy

Werner, D. (1987) Disabled village children. Palo Alto: Hesperian Foundation provides excellent practical information, mainly about identification, rehabilitation, prevention and medical therapy for children with physical disabilities.

How can teachers address physical disabilities?
Most students with physical disabilities do not have any other disabilities (although some do) and it should never be assumed that students with physical disabilities do not have normal intelligence. Indeed, some people with very severe cerebral palsy, who cannot speak or control their body movement very much at all, are very intelligent and very aware of the world around them. For example, Stephen Hawking, one of the world's leading physicists, has very severe cerebral palsy and uses an electric wheelchair for mobility, and a special electronic speaking device for speech. Teachers can be very effective in developing positive attitudes about disabilities in their school and community by talking about all the things that children with disabilities can do and achieve, instead of talking about their limitations.

Students with physical disabilities usually need to use some special equipment and materials. Most of these things can be constructed easily by teachers, parents or other community members. Older children can be a great help too.

Students with physical disabilities are often excluded from many school activities and even from attending school altogether. This is often a form of discrimination which is entirely unfair but it is sometimes done to protect the child from harm or abuse. In fact, most children with disabilities do not want to be excluded from activities and are much less likely to lead an independent and fulfilling life if this occurs. Overprotecting children with disabilities can do a great deal of harm. Teachers need to take sensible precautions to prevent injury but students with disabilities should be encouraged and helped to participate in as full a range of activities as possible. Teachers can help all people with disabilities by promoting this approach in their schools and communities too.

Curriculum does not usually need to be adapted much for students with physical disabilities, however, some adaptations need to be made in some cases. Teachers should use common sense in this. For example, it is inappropriate to expect a student to perform tasks that they simply cannot physically perform, so the teacher must select a different task that it is possible for the student to do

Effective teachers examine the activities that students need to participate in at school and they examine the educational outcomes that they want their students to achieve. They work out what practical adaptations need to be implemented to assist students with disabilities to achieve those very same outcomes. If necessary, they ask other students, colleagues, parents and other community members to help them with any special equipment or materials that might need to be built or developed.

Hearing Impairment

What is hearing impairment?

Some children are born with hearing loss while others develop hearing loss at some time. Many children have a mild hearing loss while some have severe or profound hearing loss. Severe or profound hearing loss is known as *deafness.* Children who are deaf before they learn language (2 to 3 years old) are known as *prelingually deaf.* Deafness is an uncommon disability in children but many children have a mild or moderate hearing loss. There are no data in Papua New Guinea about how many children have hearing impairments but special education resource centre workers have suggested that up to 50% of students could have some hearing loss in many areas of PNG. In any case, teachers should expect to have some students with mild and moderate hearing impairments in their classes and that some students in the local community and school may be deaf.

Prelingual deafness can be caused by a number of different conditions, including exposure of the pregnant mother to German measles (rubella) or certain drugs or chemicals, cerebral palsy and some genetic conditions. However, most hearing loss is caused by ear infections or injury in the early years of childhood. Mild or moderate hearing loss can be a temporary condition in many children due to ear infections but ear infections often also lead to permanent damage. Teachers should check regularly to see whether students have developed ear problems as ear infections can occur very quickly.

How can hearing impairment be prevented?

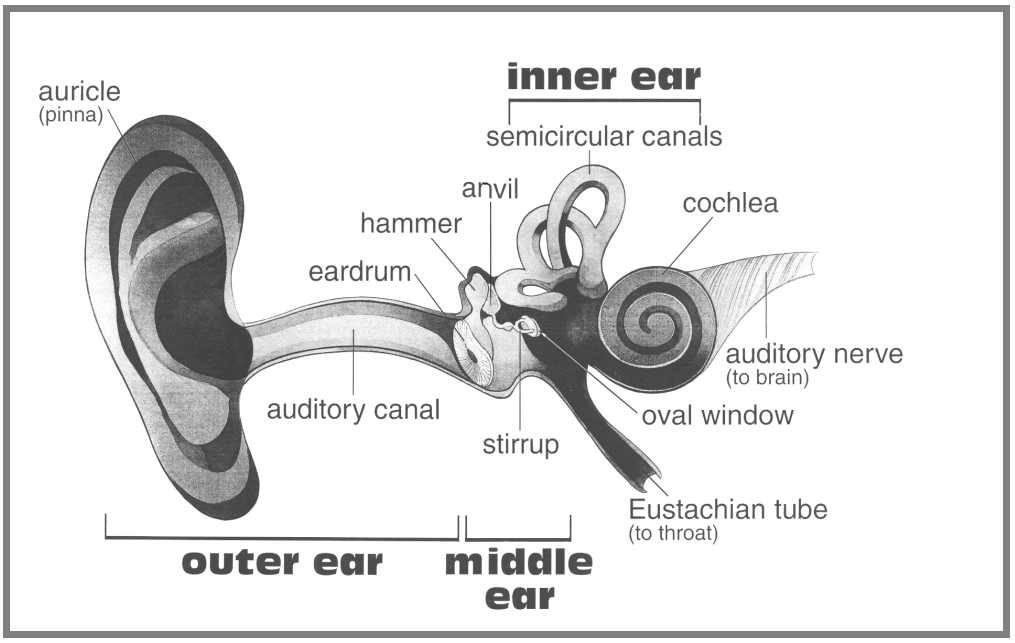
The best ways to prevent ear infections or other ear damage include:

- avoid swimming or bathing in dirty water
- never place any object in the ear
- keep the outside parts of the ear clean
- avoid loud noises
- always use the BBC (blowing, breathing, coughing) strategy.

Blowing **B**reathing **C**oughing
for Healthy Ears

1. **B**low the nose using a tissue or leaf that can be thrown in a bin
2. **B**reathe in and out strongly five times
3. **C**ough two times to clear the chest

All children in Papua New Guinea should be taught the BBC strategy. Sniffing is a very common cause of ear infections so children should be taught to blow their nose instead of sniffing.



The Ear *Courtesy of Callan Services, Wewak*

How can hearing impairment be addressed by teachers?

Mild Hearing Loss

Students with mild hearing loss might not be able to hear soft sounds (such as whispering) or they might not be able to hear certain types of sound. For example, many children cannot hear high frequency sounds, such as some of the consonant sounds in speech (*e.g*., `k', `s', `p', `t'). Students with mild hearing loss often miss many of the words spoken by their teacher and other students and they often miss word endings, such as `stick***s***', `play***ing***', `play***ed***', and so on. These students often appear to have learning difficulties and can become frustrated and upset at school as a result. Teachers need to ensure that these students are placed near the teacher where they are most likely to see and hear most clearly. These students do not usually require special materials but the teacher does need to check regularly that the student has understood their lessons. Teachers need to ensure that they use clear communication, always face the children when talking and always use complete sentences. Effective teachers also use natural gestures and body language to assist children's understanding.

Teachers can easily make a mistake with students who have mild hearing loss and think that the student has an intellectual disability or learning difficulties. The best, and easiest way, for a teacher to check a students' hearing is to say different, single words in a normal, quiet voice behind the student and ask the student to repeat the words, one at a time. If the child can repeat the words, then the child probably does not have a hearing impairment but if the child cannot repeat the words, then the child probably does have some hearing loss that may be causing other difficulties as well.

Moderate Hearing Loss

Students with moderate hearing loss cannot hear normal speech properly without wearing expensive hearing aids. Unless these students have hearing aids, the teacher will need to pay special attention to these students, repeat instructions very clearly and closely and use written material, gestures and body language more frequently. Teachers would usually recognize moderate hearing loss easily but there have been plenty of cases where students with moderate hearing loss stay very quiet and their hearing loss has not been identified. Teachers should

always check the hearing of all students from time to time. Vaughn *et al* (2000, p. 262) suggest the following practices for teachers to use when teaching students with mild or moderate hearing loss:

Use visual cues and demonstration

- Face the student directly when you talk
- Use natural gestures
- Use modeling to demonstrate how to do different procedures and tasks
- Do not try to talk to students while writing on the chalkboard
- Use pictures, diagrams and graphs
- Use experiential learning strategies

Use cooperative learning strategies

- Use peer tutors to assist the student
- Choose clear speakers for class discussions

Monitor the student's understanding

- Ask the student to repeat important information and directions
- Reword information to make it clearer
- Provide written information as often as possible

Severe or Profound Hearing Loss

Deaf students can be taught in regular classes but the teacher will need to acquire some special skills. Deaf students need to be communicated with using a combination of clear speech and sign language, in addition to extensive use of written materials. Older students, who already know sign language and who can read, can usually operate reasonably well in a regular classroom as long as their teacher provides appropriate materials and plenty of assistance. Peer tutors and cooperative learning strategies are very useful for assisting these students, especially if the student's classmates have learned some sign language.

Children who are deaf usually have associated problems. Deaf children cannot usually use normal speech and usually have some difficulties with learning because they have usually missed many learning activities and much information at home, in their community and at school. Deaf children also experience frustration as they try to communicate in their early years and can sometimes have behavioural problems as a result. Teachers need to be careful not to confuse hearing impairment with intellectual disability and they need to be sensitive to the special needs of deaf children.

Speech Impairment

What is speech impairment?

Children can have communication problems for a variety of reasons. In many cases, a communication problem is the result of another disability, such as intellectual disability, severe learning difficulties, physical disability (*e.g.*, cerebral palsy, cleft lip or palate), deafness or moderate hearing loss, or an emotional or psychological disorder. In other cases, and for no obvious reason, children have difficulty learning, understanding or expressing language. There are three types of communication problems:

Expressive Problems

Expressive problems are the most obvious communication problems. Children may be unable to sequence sentences properly so they use incorrect word order or grammar, or just speak in one-

word sentences. Children may have *articulation* problems, where they cannot physically produce certain sounds or words, or where they stutter. Some children speak too softly or too loudly and others speak in a monotone, without using expression.

Problems with Interacting
Some children lack good social and conversational skills. They don't know how to take turns when talking, they don't know how to begin or end a conversation, or they might not make eye-contact or use appropriate body language. Some children also cannot pick up the subtle expressions and emphases in language.

Receptive Problems
Difficulties with the comprehension and understanding of spoken language - `receptive' problems, are less obvious than other speech problems and more difficult to identify than other problems. Nevertheless, they can have serious consequences for children's learning and development (Wright & Kersner, 1998). Children with receptive problems struggle with the meanings of words and the meanings of sentences. They often have difficulty with the subtleties of language and with abstract concepts. They can have problems making predictions and inferences in language. Sometimes they appear to have appropriate expressive skills but this is often just meaningless chatter.

Communication problems can lead to problems in literacy and other areas of school education. Children with language problems often have low confidence and self-esteem, can be very shy and unwilling to participate in school activities.

How can speech impairment be addressed by teachers?
Children who have no speech at all, or whose speech is unintelligible, may need to use a sign language or pictorial communication system. Others may need a properly design speech therapy program. Where this is the case, teachers should seek assistance from their special education resource centre. However, the vast majority of students with language problems do not require alternative communication systems or an extensive speech therapy program. Rather, they need teaching that is responsive to their individual needs. Teachers are most effective in teaching students with communication problems when they:

- Provide individual assistance in a kindly way
- Check students' understanding regularly
- Provide all students with memory games, rhyming games, communication games and other word games frequently
- Encourage students to observe each other making sounds and ask students to feel their own mouths as they make letter sounds, words and other sounds
- Encourage mouth and tongue exercises, such as blowing bubbles, blowing paper balls, coughing, yawning and opening the mouth very wide, moving the tongue about and sticking it in and out
- Encourage and praise all attempts at speech and improvements
- Never make fun of or mimic a student's speech
- Never force a child with a speech problem to speak in front of the class
- Always respect students' dignity
- Always allow time for students to finish sentences
- Provide as many communication activities as possible
- Do not correct students' speech all the time but, instead, target one sound or skill to work on over a period of time
- Encourage speech practice and exercises at home

Vision Impairment

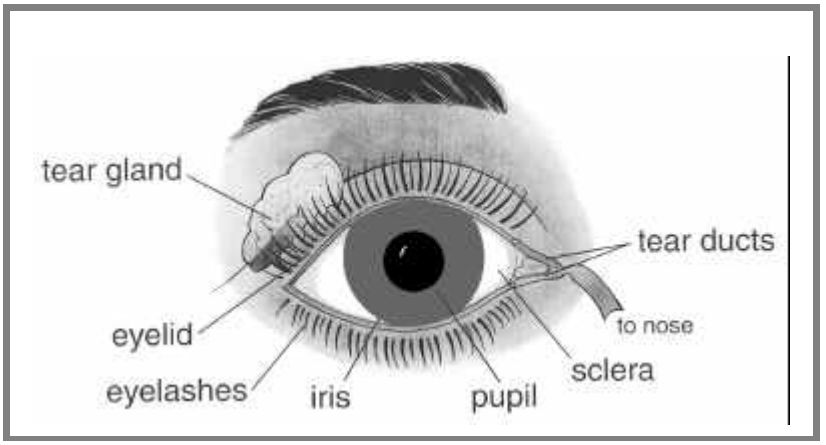
What is vision impairment?

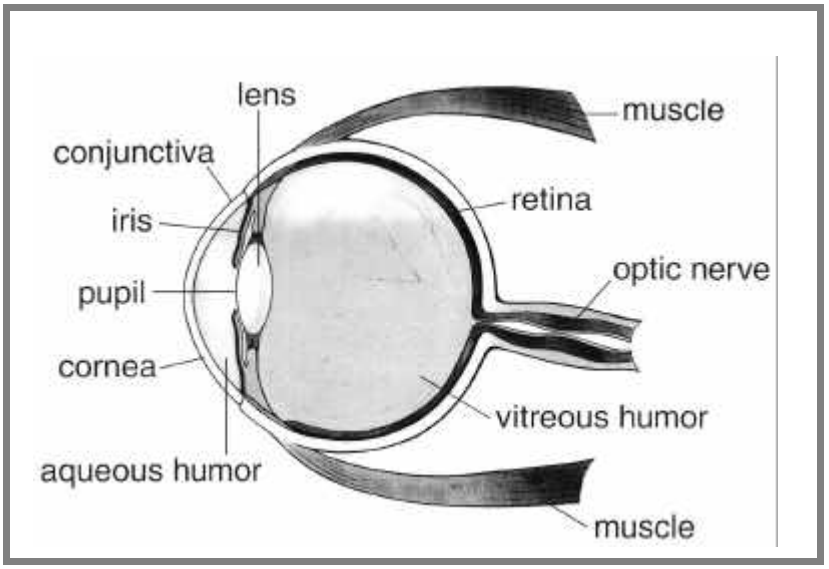
Vision plays a vital role in school learning and it is essential that teachers understand the visual abilities of their students. Serious vision problems are not common in Papua New Guinea schools but there are some students who have serious vision loss or who are blind. Many students who have mild to moderate vision impairments are not identified as such, so teachers have an important role in detecting vision impairment. As is the case with hearing impairment and some other disabilities, students with vision impairment can sometimes be mistaken for students with intellectual disability or learning difficulties, so when a teacher finds that a student is struggling at school, they should always check the student's vision and hearing. When vision impairment is not addressed at school, it can lead to learning difficulties and even behavioural problems, as the student misses important information, struggles to keep up with other students, loses confidence and becomes frustrated.

Causes and Treatment of Vision Impairment

Eye Condition	Observable Effects	Management at School
Cortical visual impairment Eyes appear normal but there is damage to the nervous system that the brain uses to process visual information. CVI is caused by brain damage.	Often occurs with other disabilities (*e.g.*, cerebral palsy). Very low or no vision. Problems making sense of visual information	Use clear and simple objects and colours to try to teach visual recognition. Use other senses (touch and hearing) for teaching and communicating.
Dry eyes Also called xeropthalmia or keratomalacia. A vitamin A deficiency resulting from malnutrition. The eye becomes very dry and the cornea softens and forms ulcers.	Night blindness and gradual loss of vision. The white part of the eye becomes dull and wrinkles. The cornea may bulge and burst, causing blindness. The condition is reversible in its early stages.	Leafy vegetables and vitamin A supplements can reverse the condition.
Glaucoma High pressure inside the eyeball. Eye becomes enlarged and blindness can occur.	Fluctuating vision loss, over-sensitivity to light, loss of visual field. Glaucoma can be stopped with medicine.	Children with glaucoma experience pain, which worsens during times of stress.
Hemianopia Loss of vision in half the visual field of each eye.	Loss of visual field. Students scan a lot. Condition can be helped with surgery and medicine. If not corrected, reading ability and other school activities can be seriously affected	Teach scanning skills. Use clear markers at the beginning and end of sentences and to mark other important visual information.
Hypermetropia Long-sightedness.	Eye strain when reading. Glasses are needed.	No special management is needed if the child wears glasses.
Keratoconus The cornea becomes cone-shaped.	Decreased distance vision in both eyes. Vision is distorted. Can be corrected with glasses but in some cases a corneal transplant is needed.	Avoid heavy contact sports. Avoid glare.
Macular disease Degeneration of the central part of the retina.	Loss of clear vision and extreme short-sightedness. Over-sensitivity to light. Loss of colour vision. Tinted	Students need to sit close to the chalkboard. Visual information needs to be very clear and well marked.

Eye Condition	Observable Effects	Management at School
	glasses and very strong glasses for distance viewing can help.	
Myopia Short-sightedness.	Blurry distance vision. Glasses are needed.	No special management is needed if the child wears glasses. Very clear materials need to be provided if glasses are not worn.
Nystagmus Rapid, involuntary eye movement.	Uncomfortable vision, which worsens at times of stress.	Provide shorter visual tasks. Allow the child to position themselves comfortably.
Optic atrophy Degeneration of the optic nerve.	Fluctuating vision loss. Very strong glasses needed for close and distant viewing.	Larger, clearer printed material. Visual information needs to be very clear and well marked.
Optic nerve hypoplasia Small, undeveloped optic nerves.	Decreased vision, depending on severity of the condition. Very strong glasses are needed for close and distant viewing.	Larger, clearer printed material. Visual information needs to be very clear and well marked.
Retinal detachment Detachment of the retina from head injury or other condition.	Partial or total loss of sight. Surgery can correct the condition. Very strong glasses can help.	Avoid contact sports. Use bright lighting for reading and other visual activities.
Retinitis pigmentosa Progressive degeneration of the retina.	Loss of peripheral vision, loss of vision in unlit places, tunnel vision, over-sensitivity to light.	Restricted mobility in unfamiliar places. Encourage scanning. Caution needs to be taken in darker places.
Retinoblastoma A tumour of the retina.	Depth perception is affected if one eye is removed. Central or peripheral vision loss, depending on the position of the tumour.	If the student has lost an eye, position the child where they can best see the chalkboard.
Retinopathy of prematurity Scars of the retina in very premature babies.	Loss of vision or blindness, short-sightedness and glaucoma. Surgery may help.	Use large print materials. Encourage use of remaining vision. Assist with mobility in unfamiliar places.
Strabismus Muscle weakness, causing turned-in eye	Affects hand-eye coordination and depth perception. Surgery or corrective glasses may help.	Allow extra time for visual tasks.
Toxoplasmosis Inflammation and scarring of the retina.	Loss of central or peripheral vision. Blind spots.	Use large print materials and clearly marked visual material.
Trachoma An infection of the eyelids and cornea, usually resulting from poor hygiene. Can also be spread by flies.	Irritation and inflammation of the eyes, small lumps under the eyelids, and partly cloudy cornea. Antibiotics can stop trachoma but good hygiene is the best prevention.	Ensure that students and parents adopt good hygiene practices, keeping eyes and faces clean.





The Eye Courtesy of Callan Services, Wewak

How can vision impairment be prevented?

Many types of vision impairments are inherited and cannot be prevented. However, some vision impairments can be prevented, as follows:

- Students need to be educated to never throw stones, sticks or other small or sharp objects at other children.
- Students need to be educated about keeping chemicals such as lime, cement, petrol, and cleaning products away from their hands and eyes.
- Students and parents need to be educated about hygiene, especially keeping eyes, faces and hands clean.
- Eyes should only be cleaned with clean water; no chemicals should be placed in or near the eye.
- Children should always be taken to a health clinic if they have any kind of eye problem or irritation.

- Children and mothers need a diet that is rich in vitamin A. The best foods for vitamin A are leafy vegetables, cassava, paw paw and other yellow and orange vegetables.
- Girls should be vaccinated against German measles (rubella).

How can vision impairment be addressed by teachers?
As a general rule, students with vision impairments need clear, well-marked visual materials (*e.g*., diagrams with important information highlighted or with arrows marking relevant parts), large, clear print in reading material and good lighting. Teachers should also ensure that the classroom is kept free of hazards and that chairs, desks, and so on, are not moved around all the time. This is to ensure that students with very low vision do not trip or stumble but, rather, can learn the layout of their classroom. Teachers should also compensate for students' low vision by using more spoken information and asking other students to help students with vision impairments with their work.

Students with vision impairments are often very poor spellers, as they are not able to recognize the patterns in words or to *picture* words, in the ways that students with normal sight do. Teachers need to be sensitive to this particular need and not assume that the student has a learning difficulty because of their poor spelling.

A blind boy using a Braille typing machine

Braille is a system of raised dots on paper that blind people can use to read. In this picture, the boy is typing with his right hand and `reading' with his left hand.

All special education resource centres have Braille typing machines.

Behavioural and Emotional Disorders

What are behavioural and emotional disorders?
Behaviour disorders are regarded as those behaviours that students sometimes exhibit that are inappropriate and unacceptable in the classroom or school. Sometimes, students exhibit inappropriate behaviour because of emotional disorders but it is often impossible to determine whether or not a student's behaviour is actually caused by an emotional disorder. For practical reasons, behavioural and emotional disorders can be grouped as one area of special need.

Most students exhibit inappropriate behaviour at some time but students regarded as having behaviour disorders perform inappropriate behaviour more often and usually with greater intensity. The behavioural disorders that usually concern teachers most are those that affect their teaching and other students, such as classroom disturbances, aggressive teasing or bullying, continual talking and calling out, taking or interfering with other students' property, inability to work independently or cooperatively, and refusal to comply with the teacher's instructions. However, some students have behaviour disorders that are less obvious and only harm their own education, such as extreme shyness, very low confidence and self-esteem, poor attendance and avoidance of academic work. These behaviour disorders could be called *passive* behaviour disorders.

What causes behavioural and emotional disorders?

There are many reasons why students have behavioural and emotional disorders and it can be very difficult to identify a specific cause. Some causes can be dealt with and changed but others cannot be resolved by the teacher. Some typical causes are:

- *Home and community factors* difficult or abusive home environment; conflict at home; inconsistent management at home; lack of sleep; lack of attention, love or care
- *School factors* disorganized teacher or teaching; unfair school discipline practices; conflict with other students; difficult or confusing schoolwork; boring schoolwork; lack of praise for good behaviour; intolerant teacher; poor relationship between school and home
- *Student factors* low confidence; poor self-esteem
- *Lack of interest* learning difficulties; unidentified disability (*e.g.*, hearing or vision impairment, headaches, other illness); poor training in social skills; mental illness; need for attention

How can behavioural and emotional disorders be addressed by teachers?

Students with behaviour and emotional disorders have often been excluded from schools in the past. However, under the Papua New Guinea National Special Education Policy (PNG Department of Education, 1993), all students are regarded as having a right to education. This implies that all teachers in PNG have a responsibility to attempt to address behaviour disorders so that such students can continue to access education and not interfere with the education of others. It is also the case that students who are excluded from school because of unacceptable behaviour are more likely to develop more serious behavioural problems away from school. If these students' needs can be met at school instead, all members of society benefit.

It can be difficult for teachers, other students, other parents, and other community members to accept that students with behaviour disorders should receive special assistance. People often regard these students as not deserving anything except punishment. However, it is the responsibility of teachers to change and modify behaviour; after all, education is really a process of changing behaviour and appropriate social behaviour should really be regarded as just another set of skills to be learned.

Effective teachers separate the student's behaviour from the student, by developing the following attitude:
I like the student but I don't like his behaviour. I'm going to change this student's behaviour into behaviour that I do like.
This kind of positive approach can benefit everyone. Sometimes it's hard work, but it's usually worth the effort!

Fortunately, there are strategies that teachers can apply on a regular basis that do actually improve students' behaviour in most cases:

- *Effective, interesting, organized teaching* — Students are much less likely to misbehave when the teacher makes sure that all teaching is understood, teachers in a way that is interesting and treats students nicely.

- *Ignoring poor behaviour* — Ignoring misbehaviour doesn't always make the behaviour go away, but it very often does. Teachers should try this strategy if they think that the student is behaving badly just to get attention, and give the student more attention when their behaviour is good

- *Rewarding good behaviour* — Praising and giving privileges for good behaviour is a very effective strategy that works most of the time. It can be hard to reward a very naughty child but if you *catch them being good* and reward their good behaviour, you can replace their bad behaviour with good behaviour.

- *Time out* — Removing the student from the classroom or playground for a few minutes or just giving the student a few minutes to `cool off' can be an effective response to very disturbing or aggressive behaviour.

- *Punishment* — Taking privileges away, reprimanding, scolding and giving extra jobs can also be very effective ways to reduce poor behaviour. Punishment should always be combined with rewards however, so that the student is taught what to do as well as what not to do. The aim is always to replace poor behaviour with good behaviour.

- *Talking and investigating* — Students behave best when they know that their teacher cares about them. By talking with students and finding out why they are misbehaving or not working effectively, teachers can help students solve their problems and improve their behaviour. This is particularly important for students who are very quiet, shy or who lack confidence.

- *Being consistent* — Teachers who are consistent in dealing with misbehaviour, and who don't let their emotions govern their actions, are more effective in encouraging better discipline. Being consistent is essential for good behaviour management.

Rights and Policies

A fundamental principle of the Constitution of Papua New Guinea is the right to equal opportunity for all citizens of PNG. In 1993 the Government of PNG and the National Department of Education formulated and implemented a national special education policy (National Department of Education, 1993) that declared three foundations underlying the development of special education in PNG for the current era. In essence, these foundations are:

- children with disabilities should have the same right of access to education as other children,
- the Government of Papua New Guinea and the National Department of Education should allocate an equitable proportion of resources, provide special education teacher training and provide specialist teachers to support the education of students with special needs, and
- students with disabilities should attend regular schools along with students without disabilities, in all cases where that is feasible.

In proceeding with this policy, the Government of Papua New Guinea provided a timely response to existing growth in provision of services for students with disabilities in PNG (provided by non-government organizations), and to national and international pressure for new and existing special education services to be more integrated and inclusive than the segregated special schools and institutions of the past. Endorsement and implementation of the *PNG National Special Education Plan and Policy* (1993) has led to rapid development of PNG's special education services and infrastructure. Due to the remoteness of many PNG communities and the difficulties of transporting students to larger centres, the inclusive model of special education may be the only alternative with the potential to maximize the numbers of students gaining access to special education across PNG.

What is the inclusive education policy of Papua New Guinea?

The Constitution of Papua New Guinea reflects principles of social justice and equity, declaring that *respect for the dignity of the individual and community interdependence are basic principles of our society* (Constitution of the Independent State of Papua New Guinea – Preamble). Unlike many other countries, the Government of PNG has extended the fundamental principle of equal opportunity into the realm of special education, declaring in the National Department of Education Special Education Policy and Guidelines (NDOE, 1993, p.21) the following goals:

- The Constitution upholds the right of every child to basic education. Therefore the State will promote equality of access to relevant, quality education for all students.

- Children with special needs have a right to an educational program suitable to their needs. Special education shall aim to develop the maximum potential of every child with special needs, enabling self-reliance and a full and happy life as far as possible in an integrated setting in the company of a normal range of children of the community.

- The specific objectives of special education shall be the development of learning competencies and the nurturing of values, which will help learners with special needs to become useful and effective members of society.

- The long-term goal of special education shall be integration or mainstreaming of children with special needs into the normal school system and into the community.

- To promote the above goals and objectives, special education needs shall be included in all forward educational planning.

PNG's special education policy is not just a general statement of intent. It contains a substantial amount of detailed, practical information and objectives, which serve to guide implementation of the policy. These include:

- *Definition and scope*
  The policy covers all students with disabilities (physical, intellectual, behavioural or sensory) who require educational modifications. It does not extend to students who are gifted. The policy applies to all levels of education in PNG, including higher education.

- *Special education resource centres*
  Special education resource centres will support schools in integration, inclusion and general special education requirements. Special education resource centres will replace their previous role as separate special schools with their new role in supporting schools and communities. provincial education offices will form teams to support schools in special education.

- *Assessment of children*
  Schools will conduct screening and other assessment procedures, to identify students with special educational needs, with the assistance of special education resource centre personnel.

- *Enrolment and organization*
  Special educational assistance will commence as early as possible. All schools will enroll children and youths with special educational needs. While some students may attend bridging programs in special classes or special education resource centres, all children should live with their families and attend their local school.

- *Curriculum and instruction*
  Students with special needs will usually follow the regular curriculum. Instruction will always be modified to accommodate students with special needs. Students will follow a modified or alternative curriculum only when absolutely necessary for the student's development.

- *Administration and funding*
  School funding, design of new school buildings, provincial and national developments in education, collaboration between government departments and other agencies and school administration must support implementation of the special education policy in all respects.

What are the benefits of inclusion?

> *Rather than a few students being seen to have `special' needs, schools must regard all students' needs as part of the fabric of human experience and must become open, inclusive and responsive institutions which celebrate rather than eliminate human difference.* (Christensen (1992, p. 8; cited in Dempsey (2001, p. 37).

In PNG, if funds and expertise in special education were allocated primarily to segregated special schools or special classes in regular schools, most students with disabilities would not be able to access these special facilities. The only way that PNG can provide special education support on an equitable basis to students across the nation is by adopting an inclusive education policy. By supporting schools to all deliver special education and by expecting all schools to fulfill this obligation, most students with disabilities in PNG can gain some assistance.

PNG's inclusive education policy does not abandon all segregated options. It is intended that special education resource centres will continue to provide special classes as some students with disabilities *bridge* between home and school and it is accepted that a very few students, with the most severe disabilities, will not attend regular schools. It is also intended that in some exceptional cases, special classes will need to be established in regular schools to serve the needs of students from several other school areas. Examples of this include classes for deaf students who need to learn to communicate with sign language, and blind students, who need to learn Braille.

Most developed nations are in the process of replacing their segregated special schools and units with more inclusive approaches. In most cases this step is not being taken because of geographical circumstances; it is being taken because of the many benefits that inclusive education has to offer schools, students with disabilities and other students. The potential benefits of an inclusive special education policy are:

- Travel time and costs are reduced as students attend their local school
- Social and cultural ties are strengthened as students attend school with the students from their own, local community
- Students with disabilities learn important life skills by interacting and communicating with students without disabilities that help them as they grow up in their community
- Students without disabilities learn how to relate to students with disabilities and become more knowledgeable about them
- Students without disabilities gain status and skills when asked to assist students with disabilities
- Students with disabilities learn a greater variety of academic skills by being in a regular class instead of the narrower curriculum of a special class
- Students with disabilities are better able to develop as a `whole person' in a regular school instead of in a special school where their disability is focused on and emphasized
- By teaching students with disabilities, teachers become more skilled in adapting their instruction to meet different needs, and are able to better meet the needs of more students
- Regular schools have higher expectations of academic performance and behaviour than is the case in special schools, leading to higher levels of performance in students with disabilities
- Communities learn to be more accepting and tolerant of disability and other differences and become proud of the achievements that their members with disabilities, with the help of the community, make.

Support Services

Papua New Guinea has a network of special education resource centres to assist schools in their provision of special education. In most cases, this involves assistance with identification of needs, joint development of instructional programs and assistance in development or procurement of materials and equipment. In some cases, special education resource centres also provide special *bridging* classes or programs for students with more severe disabilities, and special programs for students who cannot attend school due to a very severe disability.

Inclusive education is challenging and demanding, and most teachers find it difficult from time to time. Schools and teachers are able to deliver inclusive special education much more easily and effectively if they receive additional support. In PNG, support is available to many schools

through special education resource centres. Teachers need to learn how to access and best utilize the resources and personnel offered by the resource centres.

What support is available to schools and teachers in Papua New Guinea?
Services available to communities and schools in Papua New Guinea include government departments, namely the Departments of Education, Health and Social Welfare and non-government agencies, such as Callan Services, Red Cross, St John Association for the Blind, and some independent agencies that utilize funding from international sources such as Christoffel-Blindenmission and Friends of the Disabled Association (FODA).

Implementation of the PNG Special Education Policy in 1994 involved an agreement between some non-government agencies and the National Department of Education to jointly provide special education resource centre services. From that time on, the National Department of Education has funded the salaries of teaching staff in the resource centres while the centres have gained non-government funding for their other services, and for their buildings and other facilities.

In 2002 there are 11 special education resource centres, with a total of 43 NDOE-funded teaching staff. The centres have about the same number of other staff who provide community-based rehabilitation and other services to their communities. While NDOE also assists provincial education offices in their delivery of additional special education support, the special education resource centres are the major service funded by NDOE and they are the major special education service provider to schools in PNG. Callan Services is the largest non-government special education and community-based rehabilitation provider, supporting schools and communities through its special education resource centres in Wewak, Mt Hagen, Goroka, Rabaul, Kiunga, Buka and Mendi.

The National Department of Education Special Education Unit is located at:
National Department of Education
Special Education Unit
PSA Haus
PO Box 446 Waigani
National Capital District

The national unit provides administrative, teacher staffing and resource support to special education resource centres, assists in NDOE curriculum development and assists teachers colleges, elementary training and secondary teacher training institutions in pre-service and in-service training in special education. The unit also supports provincial education offices in development of support services and in-service teacher training activities.

Provincial Education Offices
It is envisaged in the National Special Education Plan (National Department of Education, 1993) that provincial offices of the National Department of Education will develop special education teams to support the schools of each province. Provincial offices will work collaboratively with special education resource centres, and it is also envisaged that each province will have a special education resource centre. In 2002 there are resource centres in 10 provinces. Some provincial offices have employed additional personnel to work in schools as special support teachers (*e.g*., Morobe Province) or to administer and develop special education within the province (*e.g.*, Manus Province and Enga Province). Most provincial offices are already involved in special education in-service training of teachers, and many provinces have funded school or resource centre personnel to attend specialist courses in special education.

Special Education Resource Centres
In 2002 there are 11 special education resource centres in 10 provinces. All centres were established by non-government organizations. Some centres have evolved into resource centres from a previous role as a special school but the newer resource centres have been developed specifically as special education resource centres and community-based rehabilitation centres. All centres provide clinical services and all centres provide direct support to schools. Some centres continue to operate segregated classes but this model is increasingly regarded as a temporary, bridging arrangement to prepare students for school. All centres provide support to children whose disabilities prevent them from attending school. These services are called community-based rehabilitation and usually involve provision of therapy, medical or clinical support, advice and guidance for parents and communities and awareness raising.

The teaching staff in special education resource centres are funded by the National Department of Education. Other centre staff are funded by non-government agencies and the buildings and other services are also provided by non-government agencies. Consequently, the centres are jointly managed by non-government agencies and the National Department of Education. The shared management arrangement works efficiently and in all centres, the NDOE staff and the non-NDOE staff share their workload to some extent. The roles of the special education resource centres are :

i. To develop and deliver special educational support to individual students and their teachers, through materials and program development, program trialling and monitoring, and direct support to the student's teacher.

ii. To develop and deliver in-service special education programs and materials for schools and teachers.

iii. To assist schools, through training and demonstration, to conduct screening and assessment procedures to identify students with special educational needs. *Special education resource centres should only engage in medical screening activities where hospital, clinic or other medical services are unavailable.*

Special education resource centres should also ensure that screening activities are always tied directly to follow-up support, or interim measures if follow-up support is not immediately available.

iv. To establish early intervention and/or home-to-school bridging programs for children and youths with special educational needs.

v. To provide home-based or centre-based educational and vocational educational programs for children and youths with very severe disabilities who cannot attend school.

vi. To assist schools with establishment and development of integrated special education resource services *e.g., integrated deaf unit; school resource teacher.*

vii. To provide educational assistance to students who are long-term patients in hospital.

viii. To liaise with the Measurement Services Unit, National Department of Education in relation to the national examination preparations for students with special needs enrolled in regular schools.

ix. To arrange referrals to hospital or other clinical services for children and youths who require medical assessment, diagnosis, therapy, treatment or other medical services.

x. To assist teacher training institutions with teacher training through identification and introduction to inclusive special education practicum sites or services, and provision of specialist advice to lecturers and trainee teachers.

xi. To ensure ongoing professional development of special education resource centre personnel.

xii. To conduct and participate in action research and ongoing service evaluation.

xiii. To network with other services and agencies with implications for education and welfare of students with special needs and special education resource centre personnel.

The roles of NDOE-funded teachers in special education resource centres are:

i. To develop and implement inclusive special education programs and materials to individual students and their teachers through
   - assisting the teacher with individualized education program (IEP) development
   - assisting the teacher with materials development
   - trialling and demonstrating IEP implementation
   - assisting the teacher to assume IEP implementation
   - assisting the teacher and school with program monitoring.

ii. To develop and deliver in-service special education programs and materials for schools and teachers.

iii. To assist schools, through training and demonstration, to conduct screening and assessment procedures to identify students with special educational needs.

iv. To design and implement early intervention and/or home-to-school bridging programs for children and youths with very severe disabilities.

v. To design and implement home-based or centre-based educational and vocational educational programs for children and youths with very severe disabilities who cannot attend school.

vi. To provide educational assistance to students who are long-term patients in hospital.

vii. To liaise with the Measurement Services Unit, National Department of Education in relation to national examination preparations. for students with special needs enrolled in regular schools.

viii. To arrange referrals to hospital or other clinical services for children and youths who require medical assessment, diagnosis, therapy, treatment or other medical services.

ix. To assist teacher training institutions with teacher training through identification and introduction to inclusive special education practicum sites or services, and provision of specialist advice to lecturers and trainee teachers.

x. To engage in ongoing professional and career development.

xi. To support the special education resource centre in its general services to schools and communities by working collaboratively with community-based rehabilitation workers and other special education resource centre personnel, and engaging in all quality improvement activities.

The special education resource centres are:

Red Cross Special Education Resource Centre
PO Box 6545 Boroko National Capital District Ph: 325 1374 Fx: 325 9714

St John Association for the Blind
PO Box 6706 Boroko National Capital District Ph: 325 1238 Fx: 325 4637

Morobe Special Education Resource Centre
PO Box 946 Lae Morobe Province Ph: 472 2089 Fx: 472 4250

Madang Creative Self Help Centre
PO Box 891 Madang Madang Province Ph: 852 3310 Fx: 852 3239

Callan Services
Callan Services oversees 7 special education resource centres:

Mt Sion Centre for the Blind
PO Box 1068 Goroka Eastern Highlands Province Ph: 732 2850 Fx: 732 3189

Callan Services – Wewak
PO Box 542 Wewak East Sepik Province Ph: 856 1081 Fx: 856 2924

Callan Services – Rabaul
PO Box 1238 Rabaul East New Britain Province Ph: 982 9738 Fx: 982 9738

Callan Services – Mt Hagen
PO Box 1191 Mt Hagen Western Highlands Province Ph: 542 2735 Fx: 542 3042

Callan Services – Kiunga
*PO Box 42 Kiunga Western Province Ph: 548 1304**

Callan Services – Buka
*PO Box 85 Buka North Solomons Province Ph: 973 9058**

Callan Services – Mendi
*PO Box 69 Mendi Southern Highlands Province Ph: 549 1102**

** These are new services so the phone numbers are likely to change*

Other Assistance
The Department of Health provides services such as immunization against serious disease, early identification of disability, surgical correction and some physical therapy services. The Department of Health also provides some rehabilitation and housing services. The Department runs extensive awareness and prevention programs.

The Department of Social Welfare assists with housing for families who have a child or adult with a disability.

Non-government organizations that are also able to assist children with disabilities and their families include:

National Board for Disabled Persons
PO Box 7501 Boroko National Capital District Ph: 325 4087

Cheshire Homes
PO Box 1306 Boroko National Capital District Ph: 325 5937

How do schools and teachers access support?
The school and the teacher are responsible for the education and welfare of each student with a disability. It is the responsibility of each school to identify those students who have special needs and to arrange for any special support that may be required. In most cases, the teacher gains assistance from other students who act as helpers and peer tutors, the principal and other teachers who can provide assistance with materials and advice, and community members, who can make special equipment and provide materials. Teachers should always investigate what resources are available in the classroom, the school and the local community.

Schools may also seek assistance from the local special education resource centre. The centre can assist the school in identifying students who need assistance, advising on special techniques, supplying materials and equipment, obtaining other specialist advice or support, and monitoring students' progress over time.

Once a student has been identified as requiring special support, and it has been decided that support from the special education resource centre is also required, there are a number of steps that the teacher should take:

1. Ask the principal to seek assistance from the special education resource centre and to ask the student's parents to agree to this step being taken.

2. Investigate all other resources that may be available, such as other students to help, parents, other community members, and colleague teachers.

3. Once resource centre support arrives, ask the resource centre teacher to assess the student. When assessment is complete, ask the resource centre teacher to advise on what needs to be done with the student.

4. Ask the resource centre teacher to demonstrate any special techniques or instructional requirements, and to show how special equipment or materials can be made or obtained.

5. Work out a plan for the student with the resource centre teacher and the student's parents. The plan should list the main targets and any special actions that will be taken. The plan should include the role of the resource centre teacher.

6. Ask the resource centre teacher to demonstrate any special techniques until they are familiar and understood. This may take a few weeks.

7. Ask the resource centre teacher to check the student's progress from time to time. A check during each school term will be adequate in most cases but some students will require much more input from the resource centre teacher.

8. Review the student's plan with the parents and the resource centre teacher at least twice each year.

Screening

In any school or class, it is highly likely that between 10% and 20% of students will have special needs. While not all students with special needs actually require much special attention, many students do. Students who do need special education are very unlikely to succeed at school if they do not receive the special education they need.

Teachers need to know what particular learning difficulties, disabilities and other special needs their students have in order to meet their students particular needs. While teachers are not medical practitioners, clinicians or school psychologists, there are some steps that teachers can easily take towards identifying students with special educational needs. Teachers can also call upon assistance from their nearest special education resource centre to assist with identification.

What is screening?
Screening is a set of simple steps that teachers can take to identify students' special educational needs. Screening involves:

- Looking for warning signs
- Conducting an initial investigation
- Screening for areas of specific need

Teachers should observe their students carefully and take note of any particular problems that a student may be experiencing. If a problem is suspected, then the teacher should conduct screening. The warning signs of students with learning difficulties or other special needs are:

- The student is unwell, often unwell or often misses school due to sickness
- The student struggles to keep up with other students or does not complete classwork
- The student doesn't always understand instructions
- The student is rejected by other students
- The student appears clumsy or awkward
- The student seems to favour one eye or one ear
- The student dislikes school or seems unhappy at school

Young students showing any of these signs could have learning difficulties or other special needs at school. If any of these signs are apparent, the teacher should investigate the situation further.

Conducting an Initial Investigation
If warning signs are apparent, the teacher should:

- Discuss the problem with the parents and try to find out any reasons for the problem
  Do the parents know of any particular problem or concern?
  Do the parents know of any reason why the student might be struggling or unhappy?
  Has the student been ill?
  Has the student had sore ears or eyes?
  Has the student been seen by a doctor or clinic recently?

- Discuss the problem with the student's previous teacher
  Was the student like this last year?

Does the previous teacher know of any particular problem?
Did the previous teacher have any particular way of dealing with the problem?

- Discuss the problem with the student (without embarrassing the student)
  Why are you unhappy at school?
  Is there a reason why you find the work difficult?
  Do you have any trouble hearing? Do your ears hurt?
  Do your eyes hurt? Do you have any trouble seeing? Do your eyes get tired?

The teacher can also try some other simple steps, like trying out different positions in the classroom for the child, placing the student with a different group of students, placing the student with another student who is helpful and kind.

If nothing obvious is found in the teacher's initial investigation, the teacher should take further steps. The teacher should check the following areas of need: hearing, vision and learning difficulties. The teacher might need to check all three areas but, in most cases, the teacher will suspect that the student's problem lies in one particular area. The teacher should screen for hearing problems first, vision problems next, and learning difficulties after that. A simple form to assist teachers to record screening results in provided on page 46.

How can teachers screen for areas of specific need?

Hearing

Students with mild hearing loss have difficulty hearing very soft voices and some of the softer sounds in a normal voice. Mild hearing loss is a very common condition among children in Papua New Guinea. It is usually caused by ear infections or chronic conditions such as glue ear (otitis media). Sometimes mild hearing loss is only temporary, occurring only while the child has an ear infection or a cold. However, ear infections often lead to permanent damage to the ear, and permanent hearing loss. Teachers should always be aware that a child with a mild hearing loss can develop a moderate or severe hearing loss if they have further ear infections, or they injure their ears. Students with itchy or uncomfortable ears can sometimes try to unblock or scratch their ears with sticks or pencils. This is very dangerous and can severely damage the eardrum, leading to more severe hearing loss.

To check a student's hearing:

1. Select 5 different objects that the student is familiar with (*e.g.*, cup, banana, kaukau, stone, spoon, bag etc.) and spread them out in front of the child.

2. Stand directly behind the student and then take one big step back and a big step to the right. Stand or squat so that your head is at about the same level as the student's head. Now you are ready to test the right ear.

3. Say in a normal voice "touch the cup", then "touch the stone" etc. Make sure that you are using a language that the student understands well!

4. Take note of whether the student hesitates or doesn't respond correctly at all. If the student seems unsure of what to touch or when to respond, there is a possibility that the student has a mild or moderate loss of hearing in the right ear.

5. Now take two steps to the left and ask the student to touch each object again. This step tests the left ear.

6. Take note of the student's responses again. If the student hesitates or doesn't respond, there is a possibility that the student has a mild or moderate loss of hearing in the left ear.

7. If you suspect that the student has a significant hearing loss (mild – moderate), discuss your findings with the student's parents and the school principal, and ask the principal to ask the nearest special education resource centre to conduct a proper hearing assessment.

If the student seems to pass the hearing screening test but you are still concerned about their hearing, try the test again with a softer voice. The student might have a very mild hearing impairment and the test will show which ear is better. Place the student near the front of the classroom if you suspect any hearing loss and place the student where their better ear is `facing' the centre of the room.

Vision
Check students for signs of vision impairment. Typical signs are:

- frequent blinking
- squinting
- red, sore, watery, or swollen eyes
- tiredness or headaches
- holding books close to the face

- holding books well away from the face
- difficulty with reading and interpreting pictures or diagrams
- difficulty catching a ball, or clumsiness
- student complains about not being able to see clearly
- sensitivity to light

Any student who seems to have problems with vision should be referred to a doctor or clinic. However, sometimes students are not aware that they actually have a vision impairment. The following test can be used by a teacher to check a student's eyesight if the teacher suspects that there could be a vision impairment:

1. Obtain an *E chart* for testing vision. Special education resource centres have E charts and an E chart is provided on the next pages.

2. Ask the student to sit or stand comfortably.

3. Go through the steps of the test close to the student so that they know what to do. Take 6 steps back from the student and show the chart to the student. Make sure that they can see the chart clearly.

4. Ask the student to cover one eye.

5. Point to the very large E and ask the student to point in the same direction that the `bars' of the E are pointing. You may need to demonstrate this to the student the first time.

6. Point to all of the Es, starting with the large ones and finishing with the small ones. Ask the student to point in the same direction as the bars of each E.

7. Repeat steps 6 and 7 with the other eye covered.

If the student has difficulty with any of the Es, the student might have a vision impairment. The teacher should discuss these findings with the students' parents and the school principal, and make sure that the student is assessed by a doctor or eye clinic. The nearest special education resource centre may also be asked for assistance with more detailed eye testing.

Learning Difficulties

There is no simple test for learning difficulties that is easy for a teacher to obtain or use and that covers the many aspects of learning difficulties. If a student is in good health, does not have a hearing impairment or a vision impairment but is struggling significantly with schoolwork, or some important part of schoolwork (*e.g.*, language, reading, or mathematics), the student may have learning difficulties. If the student struggles in most areas of schoolwork, and takes much longer to learn things than all of the other students in the class, then it is possible that the student could have an intellectual disability. If severe learning difficulties or intellectual disability are suspected, the teacher should discuss the situation with the student's parents and the principal, and also ensure that the student is assessed by a teacher from the nearest special education resource centre.

Students with learning difficulties are often embarrassed about the difficulties that they are having, and may not ask the teacher for help. They will often avoid answering or asking questions and may be quite skilful at hiding their problems. Teachers always need to be on the lookout for students who are struggling because of learning difficulties.

The checklist on page 49 is a useful guide for teachers (Adapted from *Special Education Teachers Resource Book*, National Department of Education, 1998, *Appendix VI).*

Hearing and Vision Screening

Date

Name | Date of birth | Gender (M/F)

Home address

School | Teacher

Vision Screen Results (E Test)

Eye	*Result*	*Notes*
Right		
Left		

Recommendations

Hearing Screen Results (Voice Behind Test)

Ear	*Normal Voice*	*Raised Voice*	*Quieter Voice*
Left	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Right	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

For each voice level, the student is asked to follow five instructions e.g., `Touch the cup'. Circle the number of each instruction responded to correctly. If you are sure that the student understands the instructions but responds correctly to less than 4/5 of the instructions in the `voice behind' test, then the student may have a hearing impairment.

Recommendations

60

36

24

E Chart Vision Test Part 1

18

12

9

6

E Chart Vision Test Part 2

Learning Difficulties Checklist

Poor concentration	☐	Has difficulty with key skills, such as times tables, sight words, number facts	☐
Reverses letters when spelling *e.g*., p/g, b/d, 12/21 etc.	☐	Behaves like a younger child	☐
Has difficulty with reading	☐	Does not like school or is not interested in school	☐
Does not like reading	☐	Has difficulty copying (misses words or lines)	☐
Cannot keep up with the other students in class	☐	Is clumsy or uncoordinated	☐
Learns new things slowly	☐	Speaks loudly or suddenly	☐
Has difficulty making friends	☐	Gets frustrated easily	☐
Often forgets things or is disorganized	☐	Gets angry easily and often	☐
Has difficulty with phonics (*the sounds of letters and letter combinations*)	☐	Disturbs other students in class	☐

If four boxes are ticked for a student, the student may have learning difficulties

Individualized Planning

Special education is the design and delivery of teaching and learning strategies for individuals with disabilities or learning difficulties. In most cases, students with disabilities do not require an individual (or separate) learning curriculum. Rather, most students simply need some adaptations to be made to the regular school curriculum that other students receive. Individualized planning is the process of identifying any modifications to the curriculum that an individual student may need, and working out how those modifications can be implemented.

What is individualized planning?

Individualized planning is a process that produces an individualized plan for a student with special educational needs. The teacher uses the individualized plan to implement any special teaching procedures that a student with special educational needs may require. In developing an individualized plan, the teacher needs to consider:

- What can the student already do?
- What does the student need?
- What can be provided for this student?
- When will the target outcomes be achieved?

Tekla's IP

Tekla is in her fourth year at school. Tekla likes school and she likes her teacher, Mr Akalitz, very much. When Tekla started the year in Mr Akalitz's class, Mr Akalitz knew that Tekla would have difficulties because Tekla's previous teacher had told him that Tekla was a very poor reader and that she needed special help with some of her schoolwork. When Mr Akalitz found out that Tekla would struggle with reading, he decided that he'd better *find out what Tekla could already do.*

The first thing he did was ask Tekla's previous teacher what sort of books Tekla could read, and what reading skills she already had. He then took Tekla aside in class and asked her to read from some books. He chose a very easy book (Grade 1 level), a fairly easy book (Grade 2) and a book that he thought Tekla might find a bit hard (Grade 3). Mr Akalitz worked out with Tekla that she was reading at about a Grade 1 level. He also found out that Tekla struggled with some sight words and had very poor phonics skills. Mr Akalitz had also begun noticing that Tekla was having difficulty with mathematics and some other curriculum areas. He decided that this was probably because Tekla was having trouble reading maths instructions and other written instructions. Mr Akalitz decided that he'd better work out a way to teach Tekla the skills she needed most as soon as possible.

Mr Akalitz consulted the principal of the school, Tekla's previous teacher and Tekla's parents. He wanted to find out what they thought were *the most important skills for Tekla to learn*. Mr Akalitz knew that he would only have time to teach Tekla some of the many skills she needed to learn, so he wanted to concentrate on the most important ones.

Mr Akalitz also discussed *what could be done to help Tekla* with the principal and Tekla's parents. Everyone agreed that reading, especially phonics (and other decoding skills), *should be Tekla's top priority outcome*. The principal offered to contact the special education resource centre and find out if they could suggest any special materials or techniques. Tekla's parents said that they would be able to read with Tekla each day (although they couldn't read very well either) and ask Tekla to tell them all about what she read at school each day. Mr Akalitz worked out that he could prepare some phonics practice cards for Tekla and that he would spend 10 minutes each day

listening to Tekla read, and practicing her phonics skills and sight words. He also asked another student who was helpful and kind to help Tekla with written instructions in mathematics. The other student's parents were very proud that their daughter had been chosen for such an important task! Mr Akalitz said to the principal "No one has much time to help Tekla and the other students who struggle but, because several people are giving Tekla just a few minutes of help each day, *she's getting quite a lot of help*!"

The special education resource centre staff were able to give Mr Akalitz some good ideas on how to choose suitable reading materials for Tekla. They suggested that he ask Tekla about her interests and find some easy books about those things. Mr Akalitz soon had a few books from the library that were interesting for Tekla, and he continued to use the cards and some worksheets that he had made up for Tekla and some other students. He found that *he didn't really need many resources for Tekla*. Some days he just wrote one or two sentences on paper for Tekla, using some words that he knew Tekla already knew and ones that she needed to learn.

In the discussions with the principal and Tekla's parents, everyone decided that Tekla's main goals for the year would be to build up a sight word vocabulary of 100 words, to learn all the single letter sounds (she knew many of them already) and to sound out simple consonant/vowel blends (ta, pi, etc.). *They decided to review Tekla's progress half way through the year.*

Tekla is happy with her progress. She's getting lots of help and she can see that she's learning. Mr Akalitz is happy because he has a target to aim for with Tekla and he's confident that it will be achieved because *his planning was very good and his approach is organized.*

Individualized planning (often called *individualized educational planning (IEP)*) can be a very formal process, involving therapists and many other support personnel. In Papua New Guinea, like most other developing countries, schools do not have access to therapists, psychologists or other health professionals to assist with or advise about students with special educational needs, and PNG does not have a system of financial grants to schools for students with disabilities. Nevertheless, schools can call upon assistance from their special education resource centre in many areas, and schools should involve parents in individualized planning for students with special needs. Some schools have a team of two or three teachers who form a school-based learning support team, and these teachers are available in the school to help other teachers work out plans and provisions for students with special needs. Many provincial education offices are currently sponsoring teachers to attend extensive special education training courses so that, over time, many schools will have at least one member of their staff trained in special education. This is an excellent way of encouraging schools to establish learning support teams.

Individualized planning does not need to be a formal process. It can be quite informal, as in the example of Tekla's Individualized Plan above. When a teacher finds that a student might need special assistance, the basic steps of individualized planning are:

1. *Assessment* *What can the student already do?*
   What does the student need?

Finding out what the student can do and what they need involves talking to any previous teachers, the student's parents, and anyone else who might have worked with the student. The student might already be involved with the special education resource centre or a health clinic. If so, the teacher should also ask them about what the student can do and what the student needs. Screening or other more formal assessment activities are also an important part of the process. Sometimes the teacher, with the parents, may need to refer the student to a clinic or the special education resource centre for assessment.

2. *Planning* *What can be provided for this student?*
When can it be provided?
Who can provide it?

Planning is the process of deciding what can be done to assist the student and when. It is important that this process involves the teacher, the student's parents and anyone else who may be able to offer ideas or practical assistance (*e.g.*, school learning support team members, special education resource centre personnel). These people form a *planning team* for the student.

The planning team will often find that the student needs more than the teacher or school can really provide. This should not be a problem. The planning team must decide which needs are the most important and *give priority* to those. The team should give priority to those skills that will benefit the student the most and that *can actually be achieved*. The team should also work out with the teacher, how much assistance can be given, when it can be given, and who it can be given by. As in the example of Tekla, above, a small amount of input from a number of different people, can amount to quite a lot of individual assistance.

The most important part of the planning process is selection of target outcomes. From the priorities selected, the teacher (or the team) has to select specific educational outcomes that will be targeted for instruction. These are called *target outcomes* (or targeted outcomes, or educational objectives). The number selected should be small and they should all be achievable within a set timeframe, *e.g.*, one school term. Target outcomes should state exactly what it is intended the student will achieve, *e.g.*:

- *Tekla recognizes all consonant/vowel blends with `a' and `I'*
- *Tekla reads a Grade 1 book with no more than 2 errors per page*
- *Tekla writes her name and address correctly*

Another very important part of the planning process is working out what sort of instructional methods and materials need to be used. This is most often done by the teacher alone, but it works much better if the teacher is assisted by another teacher, such as a member of the school learning support team. Teachers can also work with a teacher from the special education resource centre.

Peer tutors (other students in the class acting as helpers or tutors), are a very valuable resource for teachers to call upon. Parents are proud when their child is selected to be a peer tutor and being a tutor can actually help the tutor to learn along with the student being helped.

3. *Setting a timeframe* *When will the target outcomes be achieved?*
When will progress be reviewed?

It is important in individualized planning to set a timeframe within which the target outcomes are expected to be achieved. Setting a timeframe helps the teacher organize time well and also helps in checking whether progress is really being made. In a large class, it is easy for a teacher to lose track of students' progress. When timeframes are set in an individualized plan, the teacher can observe the student's work and check the progress against the stated target outcomes and the set timeframe. The team also sets a date to review the student's progress and to set new target outcomes. This is how individualized planning becomes an ongoing cycle of planning, implementing, observing and then more planning, and so on.
Teachers will find individualized planning easier if they use a standard format. A form that can be used for individualized planning is provided at the end of this topic.. A sample scenario is provided below and a sample planning form is also provided. Study them to see how planning is drawn from specific needs and input from different people.

Samia

Samia is in his third year at school. Samia was doing quite well at school until he fell into a fire during a celebration in his village, nine months ago. Samia suffered severe burns to his right side, and his right arm was so badly burnt that he now has very limited use of his right arm and right hand, and he has difficulty walking due to damage to his right knee, ankle and foot. Samia was given assistance with rehabilitation, which has helped him with mobility and some use of his right arm but he continues to be unable to write with his right hand and the physiotherapist has indicated that it is unlikely that he will ever be able to use his right hand for writing or other fine motor activities.

Samia keeps trying to use his right hand for writing because he feels very awkward using his left hand. He is also reluctant to try to walk as he feels embarrassed by his awkward walking and his left leg becomes very sore after a short time. Samia is depressed because of the many things that he now has difficulty with and his injuries still cause him severe pain from time to time.

Samia's teacher has arranged an individual planning meeting with Samia's parents and his clinic nurse to work out what educational priorities to set for Samia and to make sure that everyone involved with Samia agrees on what his program should be.

Task Analysis

Special education is a process of making adaptations and alterations to educational procedures, materials, equipment and facilities to accommodate the special educational needs of some students. The process of altering curriculum and instruction is, by far, the greater part. The kinds of adaptations that teachers make to their instruction and to students' curriculum varies from individual to individual, according to the particular needs of each individual. Effective teachers use *task analysis* to systematically determine what steps a student must perform to complete a particular learning task and the ways and sequence in which those steps could be taught to that student. *(The) decision making of expert teachers is (always) based, in part, on the process of task analysis* (Berliner, 1989).

What is task analysis?

Task analysis is the process of breaking down something to be learned (e.g., a procedure, a skill, an activity, an objective) into teachable parts (Westwood, 1997). The degree to which the task is broken down, and the way it is broken down, depends upon the complexity or difficulty of the task, and the capability of the learner. In practice, task analysis generally refers not only to the process of breaking a task into teachable parts but also to the manner and sequence in which the task and its component parts are then taught. Task analysis is particularly useful when teaching procedures or strategies, and is usually used for this purpose. It is also an effective curriculum-based assessment technique when a curriculum outcome is broken down into its component parts for assessment purposes. (Arthur, 2001, p. 152).

Individual Plan

Date: 4 March 2002

Name	Date of birth	Gender (M/F)
Samia S.	2 August 1993	M

Home address: East Village Mt Hagen WHP

School	Teacher
East Mt Hagen PS	Ms K.

Assessment — *Description of special educational or other needs*

Following severe burns to Samia's right side, he is unable to use his preferred hand for writing, so he needs to transfer to his left. His walking is also affected so he needs assistant with movement around the school. Samia is depressed and embarrassed by his disability following his accident. Samia's priorities are:

i. writing fluently with his left hand, using his right hand for support only

ii. practice in lifting right foot and using body to `swing' right foot forward when walking

iii. building Samia's self-esteem

Individual Plan

Target outcomes	*By when*	*Action*	*Personnel*
Form all letters correctly using left hand only	End T2	5 minutes teacher support each day; general teacher support as well	Teacher
Walk independently for 2 minutes	End T3	Walking practice with friend 3 times each day; 4 minutes each	John M.
Express positive views about own ability	End T3	Teacher encouragement; parents' encouragement	Teacher Parents

Any other action to be taken

Samia permitted to participate in all physical activities but not to be assessed or required to participate if he is unwilling

Next review date	Members of planning team
End Term 2	Ms K, Mr & Mrs S., Mrs P (clinic nurse)

Individual Plan

Date

Name | Date of birth | Gender (M/F)

Home address

School | Teacher

Assessment *Description of special educational or other needs*

Individual Plan

Target outcomes	*By when*	*Action*	*Personnel*

Any other action to be taken

Next review date

Members of planning team

What are some examples of task analysis?

Parau

Drawing a 4cm x 6cm Rectangle

1. Draw a 4cm line across the page
2. Use a set square to measure a 90 degree angle down from the end of the line
3. Draw a 6cm line at 90 degrees down from the end of the 4cm line
4. Draw a 6cm line at 90 degrees down from the other end of the 4cm line
5. Join the free ends of the two 6cm lines to form a rectangle

Maro

Drawing a 4cm x 6cm Rectangle

1. Place 2 pins 4cm apart across the soft board
2. Use a set square to measure a 90 degree angle down from one pin
3. Place a third pin at 90 degrees and 6cm down from the first pin
4. Place a fourth pin at 90 degrees and 6cm down from the second pin
5. Glue string around the four pins to form a rectangle
6. Remove the pins

Aitiria

Drawing a 4cm x 6cm Rectangle

1. Select a clean sheet of paper and a sharp pencil
2. Get a ruler and a set square
3. Place the ruler across the paper
4. Draw a line on the paper from the 0 on the ruler to the 4
5. Remove the ruler
6. Use the set square to make a square corner down from the left hand end of the line
7. Draw a short line down to make a corner on the paper
8. Use the set square to make a square corner down from the right hand end of the first line
9. Draw a short line down to make another corner on the paper
10. Place the ruler so that the 0 is on the left hand corner of the first line and the ruler follows the short line down
11. Make the short line go all the way to 6 on the ruler
12. Place the ruler on the right hand corner so that the 0 is on the corner and the ruler follows the short line down
13. Make the short line go all the way to 6 on the ruler
14. Place the ruler so that it goes between the two line ends
15. Draw a line between the two line ends to form a rectangle

The teacher, is very conscientious, and has developed separate *task analyses* to help her to teach three of her students with special needs to draw rectangles. Although the task is the same for all students, the task analyses are different because the students have different needs. The teacher has developed a task analysis for Parau because Parau has some learning difficulties and needs learning tasks to be stepped out very clearly. The task analysis for Parau is similar to the instructions the teacher gave the rest of her 35 students but the teacher used task analysis to make sure that she included very specific instructions for Parau. Most of the other students in the class could already draw rectangles and just needed the dimensions and a reminder to use a setsquare and ruler carefully.

The teacher developed a very different task analysis for Maro because Maro is blind. The teacher worked out with Maro and Maro's parents that Maro could `draw' shapes and pictures using string and glue. The teacher decided to use pins to mark the corners of geometric shapes. Maro's task analysis for rectangles will help the teacher to teach the steps of drawing a rectangle using a tactile ruler, an ordinary set square, a soft board and pins.

Aitiria has a different task analysis again because Aitiria has more difficulties with learning. Aitiria might have a mild intellectual disability. In any case, the teacher has constructed a task analysis to help her teach Aitiria, and the teacher knows that she will need to use very clear instructions and to describe each small step in the rectangle drawing procedure.

The teacher doesn't know whether her task analyses will work or if she's chosen the right steps to use. She'll now try it out with the three students and adjust those parts that turn out to be not quite right. The teacher knows that the most important thing is that the students are learning. She knows that it doesn't matter if her task analyses aren't quite right. Like all good teachers, she'll adjust her procedures and her instruction according to the performance and progress of her students. Through task analysis, the teacher is able to integrate assessment and instruction. This saves time and leads to better instructional decision-making.

Here's another example of a task analysis. Task analysis is frequently used to teach self-care skills (or independent living skills) to students with intellectual disabilities:

Self-care skill: Putting on a sock

1. Child sits with knee raised
2. Child picks up sock
3. Child finds open end of sock
4. Child checks that the heel of sock is down
5. Child slides toes into open end of sock while enlarging sock opening with hands
6. Child pulls sock over heel
7. Child pulls sock up to full height

Adapted from Westwood (1997: p. 197)

What are the ways that task analysis works in practice?

All kinds of skills and procedures can be taught through task analysis: academic skills, sports, use of equipment, preparing for schoolwork, self-care skills, and so on. In fact, we see sets of instructions that look like task analysis all the time, for example:

recipes
equipment manuals
maths textbooks
science experiments
guides

The difference between a task analysis and a set of instructions (or a recipe) is that a task analysis examines both the task and the learner, not just the task itself. To conduct a task analysis, the teacher asks this question: *What is involved in **this student** successfully completing that task (or demonstrating that skill)?* (Arthur, 2001. p. 152).

A good teacher is conducting task analysis all the time, as they teach. Most of these task analyses are not written down. They're simply a mental guide for the teacher's thinking process as the teacher plans and implements instruction. However, a more formal task analysis is used when the teacher knows that a student is likely to have significant difficulty with an important learning activity. It is most likely that the activity will have been specified in the student's

individual plan (IP). When this is the case, the teacher usually performs the following procedures:

The Process of Task Analysis

Preparation

1. Perform the task and note down all the steps. It is particularly important to include any cognitive activities as well as physical actions in the task.

2. Consider the student's particular needs and add any extra steps or special steps that the student is likely to need to perform the task *i.e., what is involved in this student successfully completing this task*?

3. Consider any prerequisite skills and knowledge. Are there parts of the task that the student should learn beforehand or that will need extra attention or training?

Assessment

4. Try out the task analysis by asking the student to perform the task, and assess the student's performance on each step. Note the student's performance and adjust the task analysis in preparation for teaching with it.

5. Draw up a record form to record the student's progress on the task. The form could contain a daily or weekly record, according to how often the student attempts the task. Some tasks can be performed on many occasions on one day, so teachers often design forms to record the student's performance on several occasions on each day.

Implementation

6. Decide how to teach the steps of the task, which steps to concentrate on and what materials may be needed. (Some tasks are best taught backwards! Backward chaining and forward chaining are discussed below.).

7. Implement the task analysis, teaching the targeted steps in the sequence decided upon, and keeping a record of progress. This usually involves the teacher allowing the student to independently perform all steps that the student can already perform but helping or prompting the student through the steps that the student cannot perform, or is still learning.

8. Continue implementation of the task analysis, adjusting teaching according to the progress of the student's performance, until an acceptable level of independence is achieved.

What sequence should be used to teach task analysis steps?

Procedures and activities are nearly always a sequence of steps. They usually have a first step and a last step, and other steps in-between. Teachers nearly always teach procedures by teaching the first step first and then the next step, and then the next, and so on. This process can be thought of as *forward chaining,* because the steps are linked together like a chain and the steps are taught in a forward sequence. Sometimes, however, teaching in a forward sequence is not as effective as teaching in a different sequence.

When students perform tasks, there is usually an *outcome*. If the task is, for example, finding a word in a dictionary, the outcome is the found word. If the student is completing a mathematics algorithm, the outcome is the completed algorithm. If the student is putting on a sock, the outcome is that the sock is on the foot. Students usually gain satisfaction from completing such tasks. They like to see what they have achieved. For this reason, when a teacher is teaching a student who is struggling to learn the task, the teacher can sometimes help the student to learn by allowing the student to finish off the task independently. In other words, the teacher lets the student finish off as much of the task as the student can do, instead of letting the student start it

off and only helping when the student fails. This method of teaching is called *back chaining* (see Westwood, 1997, p.197). Back chaining is a powerful teaching method because it prevents failure, teaches by prompting and helping, and the student has the satisfaction of seeing the result of their efforts immediately.

Another method of teaching using task analysis is called *jump-in-the-middle chaining*. In this method, the student performs as many steps of the task as they can independently and the teacher helps or prompts on the steps that the student struggles with. Benson's data form (see below) is an example of a teacher using jump-in-the-middle chaining. Jump-in-the-middle chaining is really just a fancy name for what teachers do naturally most of the time! However, when teachers implement and monitor this approach systematically through task analysis, they are able to gauge the effects of their teaching, and adjust their teaching, much more effectively.

Using Pictures
Another very effective way of using task analysis is to construct a task analysis with pictures or photographs. The teacher places a picture of each task analysis step in a booklet or in order on a card. The student then uses the series of pictures to prompt them through the task.

Task analysis as a planning tool
Task analysis can be used to guide initial planning, e.g., Samia (the student used as an example in *Individualized Planning* had to have an individual plan developed for him. Samia's teacher, nurse and parents *analysed* the major educational *tasks* that they felt were appropriate for Samia, that is, writing, walking and thinking positively. In effect, they actually performed a kind of task analysis on the primary curriculum. Their very general task analysis revealed the parts of those skill areas that Samia (i) needs, and (ii) can achieve with good teaching. Their task analysis also revealed what adaptations Samia would need, if he is to learn to perform the tasks independently.

Samia's teacher's next step, following individualised planning, is to perform a finer task analysis on the specific skills that the general task analysis showed were needed. Samia's teacher needs to task analyse each of Samia's target outcomes, that is `form all letters correctly using left hand only' (one task of the many tasks that make up independent writing), `walk independently for 2 minutes' (walking for 2 minutes is just one part of full, independent walking) and `express positive views about own ability' (There are many tasks in the general skill of having positive self-esteem). Here's an example of a fine task analysis of one of Samia's target outcomes (Samia's teacher is starting Samia's program by having him form his own name correctly; after that, she will teach him to write the easier letters (the one's that Samia finds easiest) and move on to the more difficult ones (the ones that Samia has more trouble with):

Form all letters correctly using left hand – own name

1. Grip pencil with left hand using proper grip
2. Rest right hand on desk
3. Place pencil at correct place to write `S'
4. Form an `S'
5. Place pencil at correct place to write `a'
6. Form an `a'
7. Place pencil at correct place to write an `m'
8. Form an `m'
9. Place pencil at correct place to write an `i'
10. Form an `i'
11. Place `i' dot in the correct spot
12. Form an `a'

Samia's teacher monitors his performance daily and keeps a simple record of his progress. After two weeks, Samia's chart looks like this:

	M	*T*	*W*	*T*	*F*	*M*	*T*	*W*	*T*	*F*
Grip pencil with left hand using proper grip	P	P	I	P	I	I	I	I	I	I
Rest right hand on desk	P	P	I	P	I	P	P	I	I	I
Place pencil at correct place to write `S'	I	I	I	I	I	I	P	I	I	I
Form an `S'	I	I	I	I	I	I	I	I	I	I
Place pencil at correct place to write `a'	P	P	P	P	P	I	I	P	P	P
Form an `a'	P	P	P	P	P	P	I	I	P	I
Place pencil at correct place to write an `m'	N	N	N	N	I	I	I	I	I	I
Form an `m'	N	N	N	N	P	P	P	P	P	P
Place pencil at correct place to write an `i'	P	P	P	P	P	P	I	P	P	P
Form an `i'	P	P	P	I	I	I	P	P	I	P
Place `i' dot in the correct spot	N	N	N	N	N	N	N	I	I	P
Form an `a'	P	I	I	P	P	I	I	I	I	I
N = not attempted P = teacher prompt/assistance I = independent performance										

What patterns are emerging? Samia's *data* shows the teacher what's happening, over time. The teacher can use this data, after a reasonable period of time, to make changes to Samia's plan. In this way, planning becomes a cycle of implementation, evaluation and ongoing planning.

Utilizing Aids

Aids are the materials and devices that teachers use to assist them in their teaching. In special education, this also includes equipment that is used to assist students with mobility, independence and general improvements in quality of life.

There are many resource materials in the schools and communities of Papua New Guinea that people have been using to manufacture assistive devices for many years. These resources are usually readily available and cost free. While some students in PNG have access to expensive wheelchairs and special orthopaedic equipment, many do not, so this topic also includes information about aids that can be manufactured at low cost from natural or readily available materials.

What are aids and how are they used?

Teachers in Papua New Guinea can be involved with two general types of aids; teaching aids, which are materials and equipment that help them to be more effective teachers, and rehabilitation aids, which are items of equipment that reduce the effects of a student's disability.

Teaching Aids

The variety of special equipment and materials that teachers use to assist students with disabilities is vast. It ranges from very simple materials, such as adapted worksheets and sets of flashcards for students with learning difficulties, right through to special communication devices and other highly technical equipment, for some students with very severe intellectual or physical disabilities. In between, there are items such as large print materials for students with vision impairments, cassette tape recorders that can be used for many different applications (such as `listen as you read' activities for students with reading difficulties), counters and markers, `toy money' for students with difficulties in mathematics, printed notes for deaf students, softer or lighter balls and other sporting equipment for students with physical disabilities, and so on.

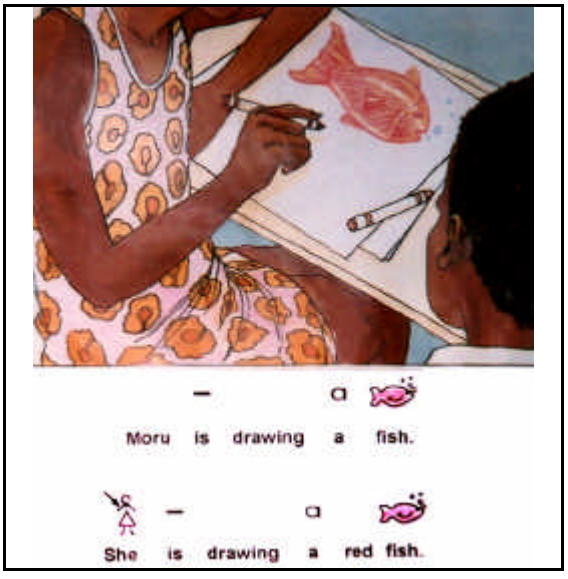
Constructing or obtaining special aids is a problem-solving activity. Teachers consider what needs to be taught and they work out how to teach it. They decide what special equipment might be necessary or desirable, and they work out how to make it or obtain it. Then they use it and adapt it if necessary. The steps for using special teaching aids are simple and well worth remembering:

Using Special Teaching Aids

1. *Decide what needs to be learned*	Teachers work this out from the student's individualized plan or the class program
2. *Decide what is the best way to teach it*	This depends on the student, what is to be taught, and the practical situation
3. *Decide what aids are needed*	This depends on what is needed, and what is available or can be obtained readily
4. *Construct or obtain aids*	Teachers use whatever is simplest and most easily obtainable. Teachers should not delay their teaching waiting for equipment.
5. *Use the special aids and adapt as necessary*	Teachers should always be prepared to change or adapt their aids and other materials to suit the task at hand
6. *Store special aids and share them*	Teachers can quickly build up a good collection of useful special aids and other teaching materials that can be used over many years. Teachers who share their special aids also find that they can then use other teachers' materials too. In this way, the work of the teacher is reduced substantially as the years pass.

Here are some ideas for special teaching aids that teachers in PNG schools can either obtain or manufacture:

- Make a simple abacus to help students in mathematics
- Make a simple spelling dictionary that students can put new words in
- Make a simple notebook that students can put words in as they learn to read them
- Use empty containers to help students who are disorganized keep their materials in order
- Collect pictures from magazines so that students who cannot draw or write can make up stories from them
- Use sago wood to pin up words as students learn to read them and spell them
- Write short stories using picture prompts as well as words (make up symbols for words that you can't make a picture of)
- Use a cassette tape recorder to make up `listen as you read' tapes
- Make up playing cards with mathematics symbols or simple equations (e.g., cards with `3 + 4', `6-2', `1+1' etc., to match cards with answers on them)
- Make up multiple choice comprehension worksheets
- Make up playing cards with matching words and pictures
- Keep containers of pebbles, sticks, nuts etc. to help students in mathematics
- Convert simple games to include spelling, writing, reading and mathematics skills
- Keep cooking equipment, toys and other everyday objects to use in lessons (students learn more easily with familiar, realistic materials and concepts)
- Cut up pictures and diagrams to make jigsaw puzzles for teaching mathematics and other concepts
- Make up letter tiles or cards to help with writing, spelling and reading



A page from a reading book with symbols added to help a student learn to read

Students playing a card game with picture cards that are matched to word cards. Any thick paper or light paper can be used for flashcards or playing cards.

- Make up letter tiles or cards with letter blends
- Make a wooden clock to help teach telling the time and other mathematics skills
- Use empty containers to make up number trays (students have to put the right number of objects in each tray)

- Use soft, light balls made from rags for sports and catching games for students with disabilities
- Use a ball with a rattle in it for a blind student
- Use dominoes to teach mathematics concepts
- Make up basic shapes for students to trace

Rehabilitation Aids

There are many different kinds of rehabilitation aids for students with disabilities. Some aids are very sophisticated and expensive, such as electronic speech synthesizers, electric wheelchairs and portable computers. Most families in Papua New Guinea are not able to afford such equipment, and they do not last very well in the humidity of PNG in any case. Some other equipment is not as expensive but a highly trained technician is needed to manufacture it or customize it so that it suits a particular student. Spectacles, artificial limbs and orthopaedic braces are examples of this type of equipment that can be obtained in PNG. Hearing aids are very expensive and also require a highly trained technician to modify them for an individual, but they can be obtained in PNG. Special education resource centres and local hospitals or clinics can usually advise schools or families where and how they can obtain these kinds of rehabilitation aids. Special education resource centres can also, sometimes, assist or advise families about how the funds for such equipment might be obtained.

Many of the rehabilitation aids used in PNG schools and in community-based rehabilitation programs are locally made from materials that are inexpensive and readily available. It is worth noting that these kinds of aids can often be better suited to their purpose and situation than much more expensive imported equipment (see Werner, 1987, pp. 525-532). Crutches, walking sticks, walking frames, wheelchairs, leg and arm braces, and special posture chairs and tables are commonly made in PNG communities from bush materials, cardboard, paper and glue.

Teachers and rehabilitation workers who regularly use such materials recommend that:

- Rehabilitation aids should suit the local climate and conditions (a wheelchair on a mountainside is usually not appropriate!)
- Rehabilitation aids should be inexpensive if possible
- Rehabilitation aids should be durable
- Rehabilitation aids should be attractive and acceptable to their user

The books by Werner (1998 & 1987) provide excellent descriptions of the many ways in which rehabilitation aids can be constructed cheaply from readily available materials. Whilst teachers cannot always be heavily involved in the manufacture of rehabilitation aids, teachers can provide parents and other community members with information about how aids can be made or obtained. Teachers can also collaborate with community members and special education resource centre personnel to work out what sort of rehabilitation aids might work best in the school situation and be involved in the design and construction of them.

This head protector is made from a strip of flexible plastic with foam glued to the inside

This posture chair supports a student whose back cannot support him. The posture chairs made from layers of cardboard glued together and then covered in paper and glue (papier mache). The chair has been painted to make it attractive and easier to clean.

This student is having fun with his new `toy car'! It's a walking frame that helps the student to walk as he is unable to walk without assistance. The walking frame has been made from timber scraps. It is an excellent example of a cheap, practical rehabilitation aid.

A low table made for a student who cannot sit in a chair. The table is made from layers of cardboard glued together and papier mache. The table is still in construction so it hasn't been painted yet. The table is sitting on a pile of old cardboard boxes which will be glued together to make more rehabilitation aids and furniture. Cardboard furniture is light, cheap to make and very strong.

Adapting the Environment

School students have a right to expect a welcoming and suitable environment in their school and their classroom. Teachers can easily ensure that their classroom is a welcoming and suitable environment for students with disabilities and other special educational needs.

How do teachers adapt the environment to accommodate students with special needs?

Effective teachers consider two issues when they plan how to adapt their classroom environment to accommodate students with special education. First of all, they make sure that their classroom and all classroom activities are accessible. Secondly, they make sure that their classroom is welcoming for all students.

Even though they each have different tasks, everyone's busy in this well organized classroom

Making the Classroom Accessible

Making sure that all students are able to access the classroom includes making sure that all students can move in and out of the room easily, and also move around easily. It also involves making sure that all students can access the lessons and other classroom activities. Students with hearing impairments have to be placed where they can hear what is going on, so effective teachers make sure that they are placed near the front of the room and where their `stronger' ear faces the teacher. Effective teachers make sure that students with vision impairments are placed where they can see most clearly and where there are no obstacles blocking their view. Their best position will always depend on the type of vision impairment that they have.

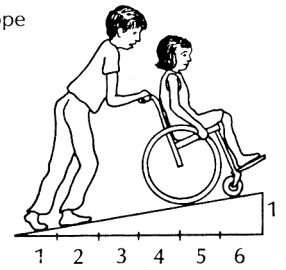
Effective classrooms are well-organized places. They have students placed together in groups and the classroom has space between groups to allow students to move around freely. Effective teachers don't just place students in groups at random. They make sure that students who need help from time to time are placed with capable, helpful students. They make sure that disruptive students are kept well away from each other. Effective teachers want their classroom to be a cooperative and productive place. They also ensure that students have designated places to keep

their materials so that time is not lost looking for things and students know exactly where to put things away. Students with learning difficulties often have trouble organizing their things and themselves. These students perform much better in well-organized classrooms where there are set procedures and routines.

Students with physical disabilities may need stair rails or a ramp to be built so that they can access their classroom. Teachers can seek assistance from the school and community for these things to be constructed. The classroom needs to have wide spaces between tables and groups so that students who may be unsteady on their feet, or who use a wheelchair or walking frame, can move around like other students (see Werner, 1987, *Chapter 51* for some excellent ideas on how to modify areas for wheelchair or walking frame access).

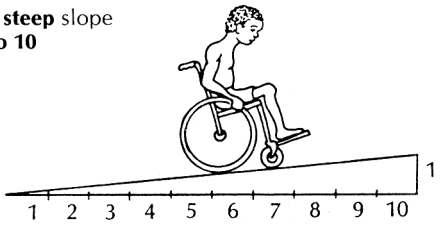
HOW STEEP YOU MAKE THE RAMP DEPENDS IN PART ON WHO IT IS FOR.

Very steep slope of **1 to 6**



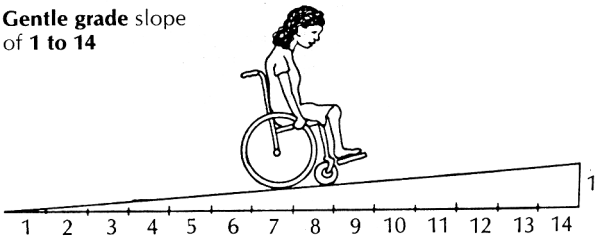
Only possible with electric wheelchair or with help. Rarely possible for rider alone. Chair may tip backwards.

Fairly steep slope of **1 to 10**



Possible for riders with strong arms; strong paraplegics

Gentle grade slope of **1 to 14**



Possible for average riders and strong quadriplegics. This is the best slope for public buildings and rehabilitation centers.

From Werner (1987, p. 489)

Students with physical disabilities, epilepsy, vision impairments and medical problems, are particularly vulnerable in classroom and school environments. Teachers need to make sure that there are no sharp corners or other hazards that students could fall onto or bump into as they move around. Tripping is very easy, especially for students with vision impairments, so teachers need to train all students to keep the floor free of trip hazards and to keep classroom objects, such as tables and chairs in the same places, so that students learn where they are and how to avoid tripping over them. Ask students themselves about how the classroom could be set up as they know best about their own needs!

Ensuring a Welcoming Classroom

No one likes to be in a place where they don't feel welcome and no one likes to think that they are causing problems for other people. Students with disabilities and other special needs are often made to feel unwelcome or that they are a burden. It is most important that teachers make sure that they do not embarrass students with special needs or damage their self-esteem in other ways.

Placing students in groups encourages cooperative learning and peer tutoring. It also allows more open spaces around the room so students with mobility difficulties can move around more easily. Students with vision or hearing impairments can still be placed where they can see or hear best.

Effective teachers always consider the feelings of students with special needs. These are the kinds of strategies that they use to help students feel welcome and worthy:

- Use sensitive, kindly students as peer tutors and helpers
- Never tolerate teasing, unkind comments or intolerance
- Always hand out special materials or worksheets in a discreet but matter-of-fact way
- Never be bothered by having to make special arrangements for students with special needs
- Always treat students with special needs with respect
- Always treat the parents of students with special needs with respect
- Always model appropriate treatment of students with special needs to others
- Use appropriate terminology and expect others to do the same
- Emphasize students' abilities instead of their disabilities

Peer Tutoring

Peer tutoring is a system of instruction in which pairs of students help one another to learn. The tutor's role is usually held by a peer in the same class or school. A typical arrangement is one in which a more capable student assists a less capable student with a particular activity or skill area.

What is peer tutoring?

There are two main types of peer tutoring:

- One student helping another student learn a new skill or some new information
- One student helping another student to practice or build up their skills

Sometimes peer tutoring is fairly informal. A typical arrangement is one in which a student who needs assistance is placed next to a student who is capable and kind, who will help the other student from time to time, as the need arises. Another, similar, arrangement is one in which a student with special needs is seated in the classroom in a group of more capable students who will help that student as the need arises. In fact, informal peer tutoring occurs in all kinds of cooperative learning activities, all kinds of group work and in many other day to day classroom situations. It should be noted that informal peer tutoring can be just as useful and just as effective as formal peer tutoring.

There are three main differences between informal peer tutoring and formal peer tutoring. Firstly, in informal peer tutoring, the tutor helps the other student with whatever they might need help with as it arises; the other student asks for help or the tutor notices that the other student needs help. In formal peer tutoring, the teacher specifies a particular task, which might be a particular skill to be learned or practiced. In this type of formal peer tutoring, the tutor would normally only be required to work with the other student for 15-25 minutes per day, although, when older students help younger students in a younger class, they may be required to work with them for 30 minutes or so.

Secondly, in informal peer tutoring, the student being assisted stays with their tutor or with a helpful group. The other difference is in training. In informal peer tutoring, the tutor is usually selected because they are just a helpful person. In formal peer tutoring, the teacher usually assigns a student as a peer tutor and provides some training in how to be an effective tutor. The training only needs to be brief, but peer tutors need to be taught how to communicate in a positive way, how to use examples and other practical ways of teaching, and how to deal sensitively with errors. Peer tutors also sometimes need to be reminded of how to treat the other student respectfully. Students being tutored may also need some training. They may need to be reminded of how to treat their peer tutor, why they need a tutor, what to do if they have a problem, and so on.

Some typical peer tutoring arrangements that have proven successful are:

- A more capable, helpful student tutoring another student in the same class
- A student of similar ability tutoring (working with) another student in the same class
- An older student helping a younger student from a younger class

Peer tutoring is used widely in Papua New Guinea schools, as it is a very sensible and efficient way to utilize the abundant human resources of the classroom, provides many benefits, and is readily accepted within Papua New Guinean cultures and traditions. Nevertheless, it is important to remember that, like most things, peer tutoring requires careful preparation and training by the teacher to be truly successful.

What are the advantages of peer tutoring?

Peer tutoring provides benefits for students with special educational needs, students selected as peer tutors, other students, and teachers. The many advantages of peer tutoring include:

- Students with special educational needs receive more help than their can teacher can provide alone.
- Peer tutoring can be particularly effective because students can be better at explaining some things than teachers (they use simpler, more direct language).

- Other students in the class benefit because the teacher who uses peer tutors has more time to spend with many students.
- Students selected as peer tutors gain status in their class and with their parents.
- Students selected as tutors gain self-esteem.
- Peer tutors themselves learn more effectively as they clarify their thinking through teaching others. *One who teaches also learns* (Westwood, 1997, p. 208).
- Peer tutoring can help build student relationships and a more cooperative approach to learning.
- Teachers are able to provide more assistance to more students.

How can teachers make sure that peer tutoring is successful?
The outcome of peer tutoring is influenced by many factors including the type of material being used, the age and sex of the students involved, the level of achievement and amount of training the tutors and tutees have. Keep in mind the following tips for fostering successful peer tutoring:

- A student of any age may be either the tutor or the student being assisted. The older student does not necessarily have to be the tutor (but it often works better if they are).
- Peer tutors are often high achievers, but an achiever at any level might serve equally well as a tutor. A more important ability of the tutor is to be a helpful person who can teach without making the other student feel unworthy or diminished.
- Same sex partners usually work best in tutoring
- Peer tutoring is easy to set up but teachers should remember that tutors should be trained in how to interact with their students and in how to present the content.

> When tutoring student's with learning difficulties, it is best if the tutor helps the student practice in areas such as reading, spelling, number facts and so on. The peer tutor is not a teacher and should never be expected to make decisions about what a student needs.

- When establishing a tutoring program, keep in mind students with disabilities and other special needs. Sometimes students with disabilities can serve as tutors to their classmates. Also, an older student who has learning difficulties or another disability, or who is at-risk of school failure, can be an effective tutor for a younger student with or without a disability.
- A good time to have peer tutoring can be at the beginning of the school day as students arrive, in the middle of the afternoon when both the tutor and student need a change of activity, or near the end of the school day. As much as possible, tutoring in a content area should occur within the content area classes.
- Being prepared improves peer tutoring greatly. Have materials ready, and make sure the students know what is expected of them (tutor and student).

> In tutor training, make sure that the tutor learns:
> - How to break steps or processes into smaller steps
> - How to set up or organize the session
> - What to do if the student doesn't understand
> - What to do if the student makes an error
> - How to show the student something that they don't understand
> - How to praise and when to praise
> - How to give the student time to think and work things out
> - How to help and guide instead of doing things for the student
> - How to prompt, remind and revise

Adapting the Curriculum – Language Difficulties

Many students with learning difficulties or an intellectual disability have difficulty with language, while some other students just have difficulty with some aspects of language. There is a range of types of language disorders and the reasons why some students struggle with speech or language can be complex. For a good general summary of the types and causes of language disorders, see Vaughn *et al* (2000, pp. 162-181) and Wright & Kersner (1998, pp. 1-5). Teachers need to understand, and respond to, the language difficulties that some students experience and the effects that language difficulties can have on students' learning in other curriculum areas.

What kinds of language difficulties are students likely to experience?

There is a general assumption that, upon completion of their elementary school education, primary school students "already know how to speak, listen, read and write in their own language" (The Primary Curriculum in Papua new Guinea, 1998, p. 20). Unfortunately, however, this is not always the case. Many students have language difficulties that seriously affect their learning and performance at school. These difficulties often affect vernacular language and vernacular language-related activities, but they are compounded as students attempt bridging to English language and academic work in English. When this is the case, such students often have poor self-esteem, little confidence, and may appear to have a reduced attention span. Such students are highly likely to experience failure and greater loss of confidence as school demands increase.

Wright and Kersner (1998) refer to three general types of language difficulties:

i. Difficulties with Expressive Language

Students may have difficulty with the form or content of language. They may be unable to sequence sentences or use appropriate grammar, or they may have *articulation* or *phonological* difficulties. Articulation refers to a student's ability to pronounce words and sentences (*e.g.*, stuttering, pronouncing `r' as `w'). Phonemes are the units of sound in speech, so students with expressive phonological difficulties have difficulty with pronouncing certain sounds in speech, or with using them in such a way that the different sounds are contrasting (*e.g.*, pronouncing `f' and `th' as `p'). Expressive language difficulties may result from a physical impairment (*e.g.*, hearing impairment, nerve damage, cleft palate) or a cognitive difficulty *(e.g*., learning difficulty, intellectual disability), or it may simply be the case that the student has not had the opportunity to learn `correct' pronunciation.

Pronunciation varies greatly between communities in PNG, and the sounds of English are often used differently by different communities. Many PNG communities do not differentiate between some different English phonemes (*e.g*., `f' and `p'). For students to learn to *decode* and read English, however, they need to learn to discriminate between such phonemes. Students with language difficulties are highly likely to have significant difficulty in these circumstances. Teachers need to be particularly sensitive to, and value, these kinds of cultural characteristics and differences, and support students through clear explanations and the use of clear examples.

ii. Difficulties with Pragmatic Skills

Sometimes students have particular difficulty with the interactions in speech, for example, non-verbal communication, eye-contact, expressions and emphases. They might not know how to carry a conversation, or how to interrupt politely, or the particular implications of certain vocabulary (*e.g.*, a student may not know how to form a question, so it may sound like a demand). Once again, different cultural groups in PNG use language and other communication

forms differently from each other, so teachers need to learn to differentiate between pragmatic difficulties and cultural differences.

iii. Difficulties with receptive language

Receptive difficulties are more difficult to recognize than expressive or pragmatic difficulties but they may be more common. Some students have *phonological* difficulties, where they find difficulty with discriminating between sounds. They might not be able to tell that a word, such as `cat' is made up of separate and distinct sounds `k', `a' and `t' linked together, or different *phonemes* may sound the same (*e.g.*, `t', `th', `f', `s', `sh', `ch'). Such students may not seem to hear final sounds, suffixes and prefixes.

Other students' difficulty with receptive language may stem more from difficulties with meaning, either of sentence structures or vocabulary. Abstract concepts, tense and inferences confuse such students. Some students may express plenty of meaningless language that masks their underlying difficulty.

As with other language difficulties, receptive difficulties may stem from a physical impairment, a cognitive impairment or a particular set of learning experiences.

How can teachers identify students with language difficulties?

Vaughn *et al.* (2000, p. 181 (adapted)) suggest the following tips for identifying a student with possible language difficulties:

Language Form

- Does the student mispronounce sounds or words and omit endings?
- Does the student comprehend and produce types of sentences similar to those of other students in the class?
- Is the student's language as well formed and descriptive as that of the other students in the class?
- Are the student's comprehension and production of language rules similar to those of other students in the class?

Language Content

- Does the student comprehend and produce vocabulary as rich and varied as that of other students in the class?
- Does the student comprehend other students' ideas and express his or her own ideas as effectively as other students?
- When talking, does the student have significant difficulty finding the word he or she wants to use?

Language Use

- Does the student use different language for different purposes (*e.g.*, to gain attention, to ask questions, to express feelings)
- Does the student take turns properly in conversations?
- Does the student initiate conversations?
- Does the student maintain a topic during conversations?
- Does the student have more than one style of interacting, depending upon the listener, situation and topic?
- Does the student recognize when the listener is not understanding, and try to clarify his or her meaning?

How do teachers adapt the language curriculum for students with special educational needs?
A *whole language* approach to language development, where language is taught in a purposeful way, in a realistic context, is encouraged in the Papua New Guinea Language Syllabus (National Department of Education, PNG, 1998). Within this context, students with language difficulties can be assisted and responded to in relatively straightforward fashion by competent teachers. In general terms, teachers are encouraged to follow the regular curriculum, with modifications as follow:

Be a Sensitive Teacher
Students with language difficulties are often embarrassed or nervous about their particular problem. Although it is wise to encourage the involvement of such students in as many language activities and contexts as possible, it is unwise to place them in situations where they are likely to be embarrassed or frustrated. These situations may hinder, rather than improve, a student's language development. Teachers need to be sensitive to students' particular needs, limitations and fears.

Use Meaningful Contexts
Teachers should encourage students with language difficulties to practice their skills in realistic, purposeful contexts. Such students can be included in the range of activities that occur throughout the school day and teachers can also develop role-play activities to create opportunities for development of language skills. Use meaningful, practical examples to strengthen students' understanding of syllabus outcomes as they arise. Vaughn *et al* (2000, p. 184) describe an excellent tool for promoting language development and practice, in which a barrier is placed between two students so that they can't see each other, and each student has to describe to the other student a drawing or simple structure that they have created. The listener tries to make the same thing by following the other student's `instructions'.

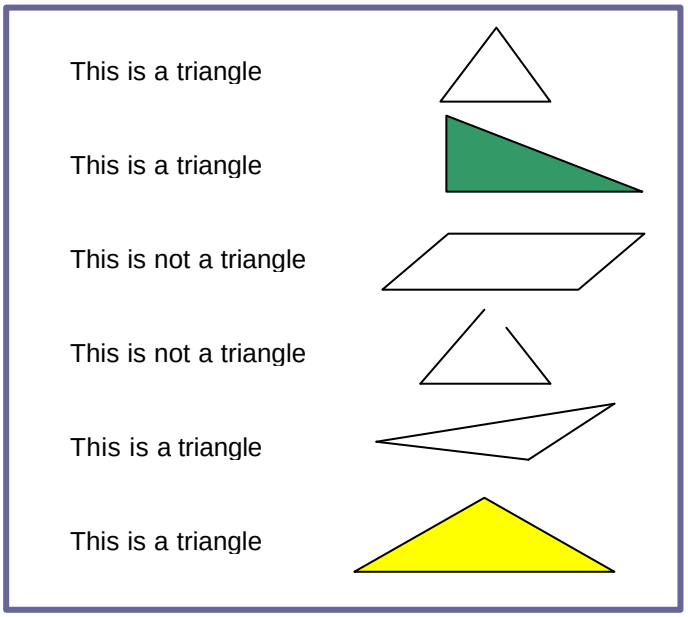
Extract from Vaughn et al. (2000) p. 184.

Use Direct Teaching
Whole language approaches to language and literacy development generally need to be complemented by direct teaching methods, especially for students with learning difficulties. Teachers need to ensure that they supplement whole language activities with direct teaching of receptive as well as expressive language skills. For example, teachers should always include direct instructions, descriptions and discussions of meanings when introducing or reviewing new concepts and vocabulary. Teachers should model and demonstrate procedures and skills

targeted for development. When introducing new concepts, teachers should provide a range of examples of the concept, and point out the distinctive features of the concept examples. Teachers should also use *non-examples* when teaching concepts. Below is an example of the use of examples and non-examples that a teacher could use to teach the concept *triangle*. We could call this set of examples and non-examples a *concept teaching set.* Note that the teacher has used a range of examples of triangles, starting with a typical or *classical* example, but then introducing triangles of different size, shape and colour. In this way, the students learn that the concept *triangle* includes a range of quite different things. Note also that the teacher has used non-examples; starting with one (a parallelogram) that is very different from a triangle but then using one (the open shape) that is quite similar to a triangle. The teacher would also explain the actual definition of a triangle, but by using examples in a creative and structured way, the teacher will probably be successful in teaching this concept to all students, even those with significant language difficulties.

The teacher should follow up this presentation by pointing to the shapes in random order and asking the students, "Is this a triangle?" In this way the teacher can check the students' understanding.

Using examples and non-examples to teach the concept `Triangle'



Another technique that effective teachers use to facilitate understanding of vocabulary and concepts, is to try to relate them to their context and to similar things, *e.g.*, "It's like …", or "You'll see them at …", and so on (Vaughn *et al.*, 2000).

Teachers should always ensure that their instructions and descriptions are very clear. This means that teachers need to be aware of the level of understanding that their students have and how explicit they need to be. It is better to assume that students might not understand, and to clarify information, than to wait until students get it wrong. Effective teachers always try to avoid setting students up to fail. To ensure clarity, teachers also often use non-verbal cues, gestures, facial expressions, pictures and other aids. Effective teachers use whatever it takes to make sure that students understand.

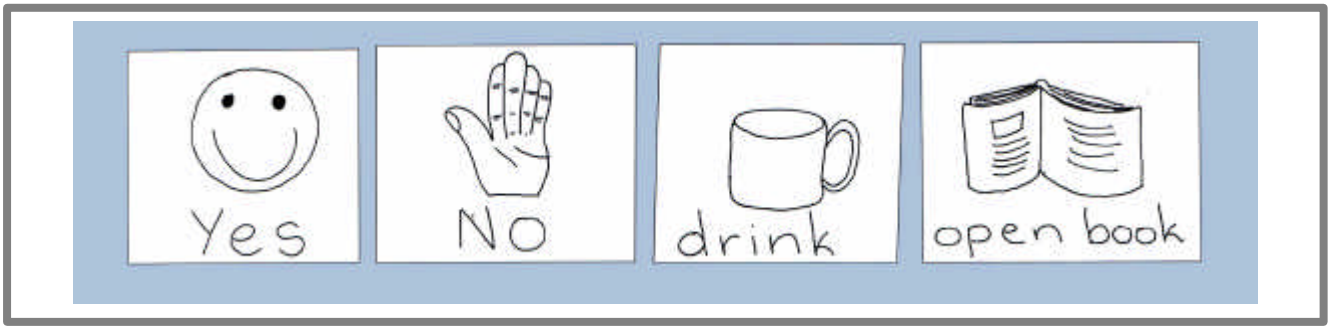
Use Appropriate Pacing and Pauses
Students with language difficulties often need more time to process verbal information and to produce speech. Effective teachers slow down the pace of their instruction and use frequent pauses to ensure that students have time to process the information. They also allow students more time to speak and express their thoughts, ideas and questions. They wait longer for responses to questions and don't just choose the student who puts their hand up first! Rather, they make sure that students with language and learning difficulties are given more time and an equal opportunity to be involved in class discussions and to answer questions.

Use Modeling and Demonstration
Effective teachers provide excellent language models for students. It's a good idea to *think out aloud* with students to model the thinking and language production process for students. It's also a good idea to explain to students how and why certain language forms are being used in different situations, and to demonstrate this. Teachers can even role-play language interactions for and with students to demonstrate the language skills being taught more clearly.

What are some examples of adapting the language curriculum for students who need an alternative communication system?
Students who are unable to speak, due to a physical or cognitive impairment, may require an alternative communication system. Students who are unable to hear or understand verbal communication may also require an alternative communication system. Deaf students typically use sign language but sign language can also be used to assists some students with severe intellectual disability, because signs can be easier to learn than spoken words, in some cases. This is because words are *transient*; they disappear as soon as they are spoken, whereas a sign can be held in place, allowing the student time to observe it. Signs can also be physically modeled and prompted to aid understanding and production.

Sign language is a complex and extensive topic in itself. Teachers should review *Melanesian Signs for Communication with the Deaf* (National Department of Education, 1994).

Pictorial communication systems can be a very useful communication tool for students who cannot use spoken words or signs. The advantage of pictorial systems over sign language is that pictures are widely understood, unlike signs. Teachers can draw small pictures (or symbols) of important events (*e.g.*, eating, drinking, toileting, playing) or objects (*e.g.*, book, toy, pencil, food item) and paste these on a student's desk or wheelchair table. A student who is unable to speak can communicate their basic needs and wishes by pointing to the relevant picture, and the teacher can also communicate to the student using the picture. Concepts such as *yes* and *no* can also be added in symbolic form.

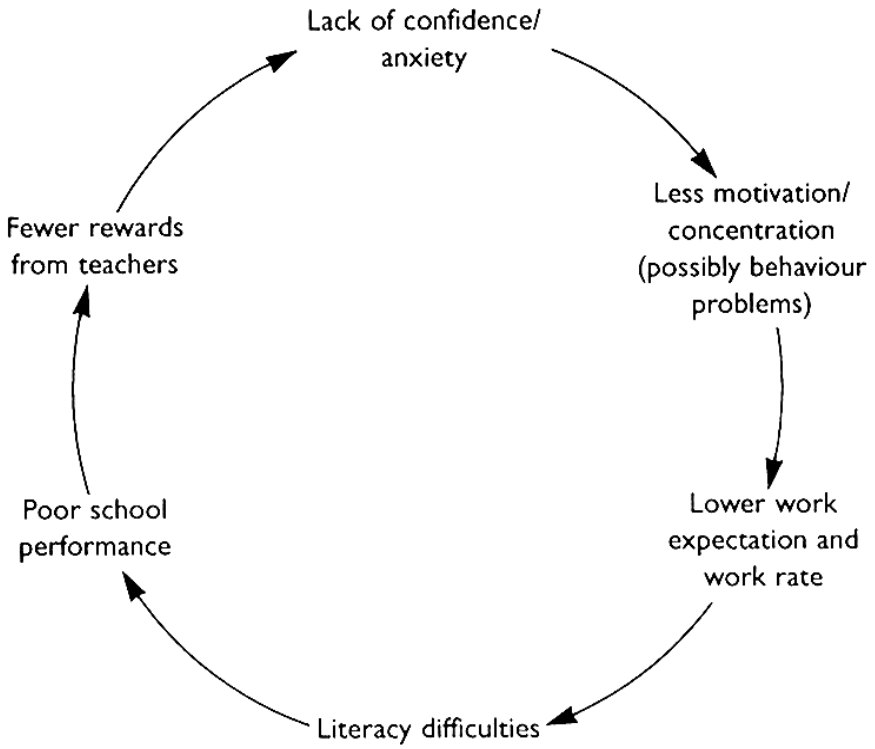


A selection from a pictorial communication board used by a student with cerebral palsy

Adapting the Curriculum – Literacy Difficulties

Doyle (1993; cited in Robinson, 2001. p. 170) suggests that 83 percent of a typical school day is spent on activities involving reading and writing. Literacy difficulties are the largest single area of special educational need and they affect students' performance in all curriculum areas. Most other disabilities or learning difficulties (including behavioural problems) affect students' progress in literacy. All teachers need to understand the literacy difficulties experienced by students, and know how to address them.

Students with literacy difficulties can easily be caught up in a downward learning cycle in which their literacy difficulties lead to negative consequences, which, in turn, exacerbate their literacy difficulties. Robinson (2001, p. 171) represents this cycle as follows:



Downward learning cycle *from Robinson (2001) p. 171*

Teachers are best placed to interrupt this kind of cycle. Effective teachers ensure that they take steps to prevent literacy difficulties, identify literacy difficulties and respond to the needs of students with literacy difficulties. Importantly, while the causes of literacy difficulties in students are commonly unknown, poor or inappropriate instruction is a known cause, and teachers who fail to respond to students' difficulties or continue to provide inappropriate instruction, exacerbate the difficulties students experience. On the other hand, teachers who do provide instruction aimed at preventing failure, and who do respond appropriately to students' literacy difficulties, can remove or dramatically reduce students' literacy difficulties.

What kinds of literacy difficulties are students likely to experience?

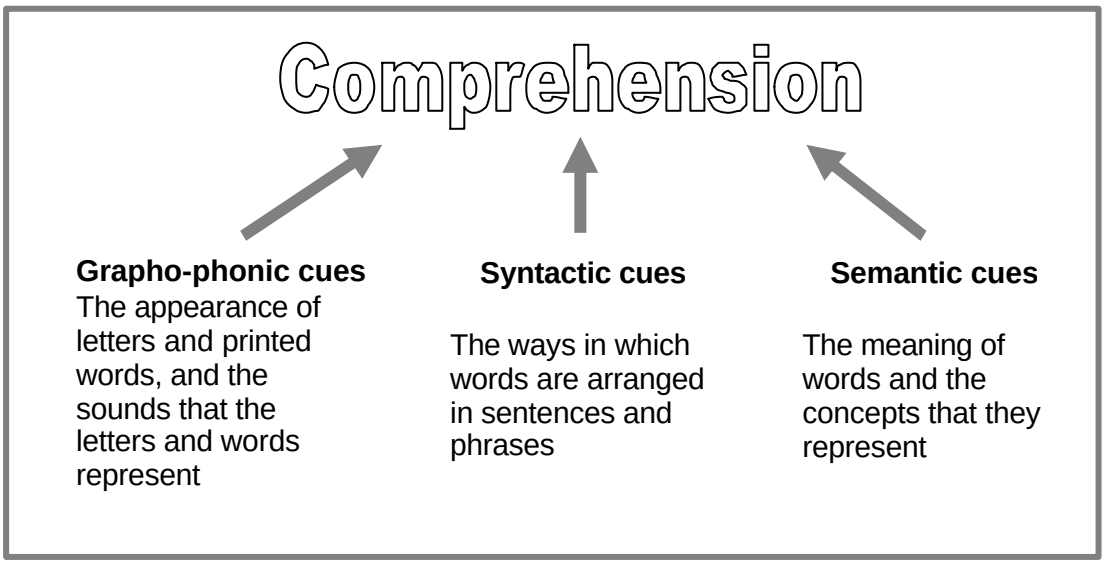
Students may experience difficulties with reading, writing and spelling. Difficulties with reading represent the greatest proportion of students with serious literacy difficulties, and

reading difficulties have the most serious overall consequences, but students who are very poor spellers or writers may also suffer significant negative consequences, including reduced academic scores, poor self-esteem and low confidence. However, in Papua New Guinea, with its broad array of languages, its high incidence of `invented' (largely phonetic) spellings of English and Tok Pisin words, there exists a high tolerance of spelling variations, so the negative consequences of spelling difficulties are likely to be less severe than in the more developed English-speaking countries. It is likely that a similar pattern applies in regard to the grammatical and syntactical structures of written English and other languages in PNG.

Reading difficulties, however, can have much more serious consequences. Students who struggle with reading typically have low confidence and self-esteem, and their reading difficulty causes problems across all other school curriculum areas. Students who struggle with reading tend to struggle with most other things at school. It can seem that there are nearly as many theories of why students sometimes struggle with reading, as there are opinions about the nature of reading itself; in other words, there is a multitude! However, the international field of reading research has converged to some extent since the release of Adams' landmark study (Adams, 1990 *see Snow et al, 1998)* and approaches to reading failure prevention and remediation also seem to be reaching common ground in recent years. Vaughn *et al* (2000, pp. 372-3) provide an excellent, concise summary of the reading process, and implications for classroom action:

Reading as an Interactive Process
Readers interact with three cue systems when they read. There are *grapho-phonic cues, syntactic cues* and *semantic cues.* Syntax is the structure of language; so syntactic cues are the ways in which words are arranged in sentences and phrases that lead to understanding of printed language *e.g.,* when we read *The woman ate the fish,* the syntactic cues (the order of the words) tell us that the fish didn't eat the woman!

Semantics refers to the meaning of the concepts in language, so semantic cues are largely the meanings given by words. In the example above, we need to understand the concepts of *woman, ate* and *fish* to derive meaning from the statement. Because the term *ate* is used (instead of *eat* or *is eating*), we know that the action has already occurred; it's in the past tense.
Grapho-phonic cues are the symbols of written language, *i.e.,* the print. Written English uses the *alphabetic principle*, meaning we use an alphabet of letters to form words. Graphemes are the printed symbols in written English while phonemes are the sounds in English, *e.g.,* the word *telephone* is made up of 6 graphemes **t-e-l-e-ph-one**, which describe 7 phonemes, namely **t-e-l-i-f-ow-n**.



Good readers use all of this information in an interactive way, and good readers use the other cues to find the meaning when one of the cues doesn't help them, for example, we can usually work out the meaning of an unknown word by understanding its context and the meaning of the other words that we do know; and we can usually work out how it sounds from the grapho-phonic cues it contains.

Students can struggle with any of the cues in reading. In particular, students who are unfamiliar with spoken English are more likely to struggle with the syntax and semantics of written English. Students bridging from their vernacular language to English are highly likely to find difficulty with this. In English speaking countries, students are most likely to struggle with the grapho-phonic relationships in reading; in particular, *phonological (or phonemic) awareness*:

Phonological Awareness

In order to understand that printed words are made up of separate symbols representing the separate sounds of any given word, students must be able to pick out the separate sounds in the spoken word, *e.g.,* the word *pig* has 3 separate sounds, **p-i-g** and a student must be able to separate (or discriminate between) those sounds in the spoken word, to understand how they are represented by 3 separate letters. Many students are not able to do this, and research shows that an inability to recognize rhyming and similar sounds, and to pick out individual sounds and syllables, in spoken words, is a key indicator that a student is likely to experience reading difficulties (Snow *et al*, 1998).

Students who struggle with any of the three main cueing systems of reading are likely to not learn to read, or read in a halting manner. Students need to be fluent readers to be able to understand (comprehend) what they are reading about, so any obstacle to fluent reading is going to limit a student's ability to comprehend what they read.

Reading as a Strategic Process
To be fluent readers who comprehend well, students also need strategies, such as *decoding.* For example, a student needs to know how to approach (or attack!) a new, unknown word, so they can work out how it sounds and what its meaning is. Students with good phonic knowledge can usually work out how words are likely to sound, and good readers also know to read ahead and examine the context to work out meaning. Students who don't know these strategies typically struggle with reading and, especially, comprehension.

Reading as a Search for Meaning
Good readers are able to make judgments and inferences about what they read. These strategies are necessary to derive meaning from most written material. Students with reading difficulties usually require these strategies or skills to be directly taught to them, by example and direct instruction.

Reading as a Process of Constructing Meaning
Readers can only understand the meaning of written material by connecting it to their own prior experiences, background knowledge, culture and interests. Consequently, reading should always be regarded as just one aspect of language and a student's performance in reading will always be largely dependent upon their knowledge and experience of language.

Reading as a Socially Mediated Activity
To some extent, students learn to read (and spell, and write) in a way that is similar to learning other aspects of language. That is, they learn in an interactive way with other students. They learn from each other. As students interact, they hear the attempts, mistakes and examples of other students, and that helps and accelerates their own learning. Students who are unable to

engage in this process, do not learn as readily, so they begin to struggle in relation to their peers. Poor social and attentional skills can interfere with students' progress in learning to read.

How do teachers adapt the curriculum for students with literacy difficulties?
Much writing on assisting students with learning and literacy difficulties over recent decades has focused on building confidence and self-esteem, and on providing students with material that is relevant to their own particular context, background, needs and interests. More recent material continues this focus but more emphasis is now being given to the structural elements of literacy, especially phonological awareness and decoding strategies.

Creating a Positive and Meaningful Context
Snow *et al* (1998), Wengip and Bristow (2001, pp. 19-21), Vaughn *et al* (2000, pp. 373-4) and Robinson (2001, pp. 231-6) provide many useful tips for creating a positive and meaningful context for learning to read and write, and responding to literacy difficulties.
For students with literacy difficulties, and those likely to experience literacy difficulties, it is essential that teachers provide an encouraging and positive environment. Wherever possible, reading and writing materials, and activities, should reflect students' interests and be relevant to their everyday experiences. Reading material that is taken directly from the students' environment, and that is directly useful to the student (*e.g.*, advertisements, comics, food tin labels, signs, known stories), can be a very powerful teaching tool. Students also learn more efficiently when they experience plenty of success so it is important that material and activities presented to students is aimed at their particular skill level as well. Teachers can also write down students' stories or help students construct written stories, which can then be used as reading material for practice and revision.

Always treating reading as a valuable and enjoyable experience is also a very important approach for teachers to take. Effective teachers make sure that they always build reading for fun, reading stories to the class and other enjoyable reading activities, into their school day to set a positive example and encourage students to have a positive attitude to reading.

Responding to Actual Need
Teaching is most effective when it responds to actual and immediate need. For a teacher to respond to the needs of students with literacy difficulties, they must have a method for assessing and monitoring students' literacy development and progress. Westwood (1997, p. 89) suggests that individualized assessment is aimed at finding answers to the following questions:

- What can the child already do without help? What skills and strategies has the child developed?
- What can the child do if given a little prompting and guidance?
- What gaps exist in the child's previous learning?
- What does the child need to be taught next in order to make good progress?

Creating *portfolios* of samples of students' work, is an easy and very useful way of keeping track of students' progress in writing and spelling. Running records of students' reading activities can be added to work sample portfolios. The simplest form of running record is just a copy of a passage that a child has read, with the number of errors and the type of errors noted, and the time taken to read the number of words. This kind of record can be based on just one or two minutes of reading out aloud and should be taken frequently *e.g.*, once per week. Students do not learn efficiently if they can read less than about 80% of the words in a passage. If the student cannot read at least 80% of the passage correctly, easier material needs to be provided. Listening to individual students read is the best form of reading assessment, and allows the teacher to answer all of the questions above, as long as the teacher is an active listener and provides prompting and guidance, and asks the student questions during the session.

When teachers observe and listen closely to students, they can usually work out quickly what individual students need, and assist each student with guidance, prompting and practice, and by providing activities that the student finds challenging but not too challenging. Teachers should always try to provide material in which only about 20% or less is unknown or difficult. When students feel successful, they perform better.

There are three areas of learning to read that students typically need assistance with; phonological awareness and decoding, sight word recognition, and fluency and comprehension. Students with literacy difficulties usually need assistance in these areas. Teachers should also ensure, however, that these areas are always included in literacy instruction as they are very effective in reducing the occurrence of learning difficulties. They are very powerful preventative strategies.

Phonological Awareness and Decoding
Phonological awareness is a key reading skill, essential for decoding and an understanding of phonics and spelling, and the best known predictor of future success or failure in learning to read (Snow *et al*, 1998). Teaching phonological awareness is one of the most powerful failure prevention strategies that teachers can adopt. Vaughn *et al* (2000) summarize phonological awareness as follows:

- *rhyming* identifying similarities and differences in word endings
- *alliteration* identifying similarities and differences in word beginnings
- *blending* putting sounds (phonemes) together to form words
- *segmentation* dividing ideas into words, and words into syllables *and individual phonemes*

Phonological awareness is easily converted into learning activities. Young students generally find such activities enjoyable as well as helpful. Vaughn *et al* (2000, pp. 377-81) and Snow *et al* (1998) provide many useful strategies. Phonological awareness activities may include:

- learning rhymes (rhyming)
- clapping out sounds or syllables in words and names (segmentation)
  e.g., Let's clap out the sounds in `pig' – say sounds as we clap clap clap
  e.g., Let's clap out the parts of `kaukau' – say parts as we clap clap
- counting the number of separate sounds in words (segmentation)
  e.g., How many sounds can you hear in the word `banana'? (6)
- counting the syllables in words (segmentation)
  e.g., How many parts are there in the word `banana'? (3)
- making up new words by changing the beginning sound (alliteration)
  e.g., Here's a word - 'dog' . Let's start that word with another sound - `fff'. What word does that make?
- making up new words by changing the end or middle sound (rhyming)
- making up words by blending sounds or syllables (blending)
- naming the beginning, middle or ending sound in words

As students develop phonological awareness it is important that they also begin forming letter-sound relationships, *i.e.,* they begin to associate certain sounds (phonemes) with certain letters and letter combinations (graphemes). They learn, for example, that the letter *a* usually sounds like `a' or `ay', that the letters *f* and *ph* make the sound `fff', and so on. Understanding letter-sound relationships is the starting point for decoding. The main decoding strategy is usually called *phonics instruction*, or just *phonics*. Usually, phonics should not be taught in isolation. A program which just consists of phonics can be boring and it is not relevant to students' context

or interests. Usually it is much better to embed phonics instruction in real, meaningful reading activities and include some intensive or practice activities in that way. Sounding out new words is a typical example of this kind of instruction. However, many students with literacy difficulties need a more explicit, more direct approach to phonics.

For students with, or likely to develop, literacy difficulties, teachers should invent or select phonics games and rhymes and develop activities in which students complete puzzles and worksheets that deal with letter-sound relationships and blends. Letter-sound relationships and blends should be introduced one at a time and teachers should not rush through this. Teachers should begin with the easier, clearer letter-sound relationships (*e.g., m - `mmm', f - `fff' etc.*) and work towards the harder, less distinct relationships (*e.g., vowels, x, y etc.*).

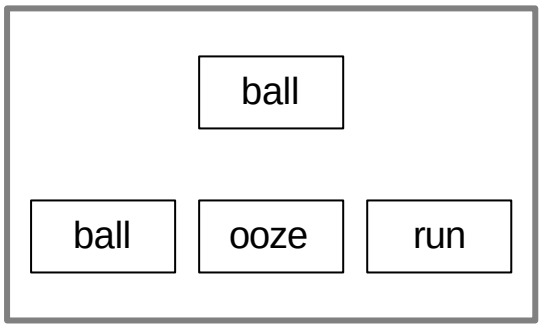
Blends should also be introduced in an easy-to-hard sequence (*e.g., start with simple blends like `th' and `er' before moving on to more difficult blends like `ome', `ough' etc.* There are many textbooks outlining different approaches to teaching phonics and it is likely that any recommended approach will be successful if taught carefully and sensitively.

The most important thing for teachers to remember is that decoding strategies must be taught to students likely to experience difficulties and those already experiencing difficulties, and that decoding strategies should be taught gradually and carefully, in an easy-to-hard sequence.

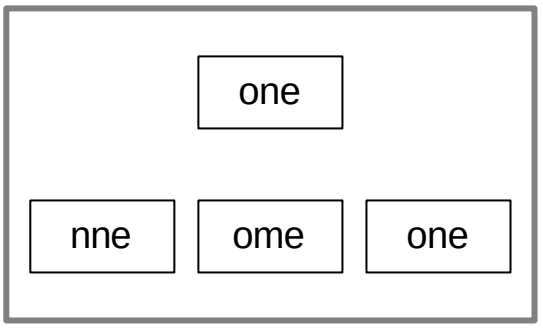
For a student to progress from simple phonological awareness to understanding letter-sound relationships and simple blends, a period of two or three years of regular instruction (5 – 10 minutes per day) may be necessary, although many students progress much faster.

Sight Word Recognition

Many common words in English are not *phonically regular*, they don't sound the way they're written (unfortunately!). This fact can make it more difficult for some students to learn to read. Consequently, these words have to be learned by sight. In any case, it is useful for students to build up a sight vocabulary as this helps them to reader more fluently and, therefore, to comprehend what they read much better. Sight words can be taught in the context of ordinary readers and other reading material but many students need extra assistance to build up their sight vocabulary. Flash card drill is useful as long as it's only done for a few (2-4) minutes each day and done regularly. Once again, new words should only be introduced gradually, so that students already know most of the words in the flashcard set they are presented with. A good system for teaching sight words is the *match-to-sample* system. In match-to-sample, the teacher lays out three or four words and holds up a word that matches one of the four words. The student has to point to the word that matches. Match-to-sample activities can be used to teach students to discriminate between words that are very similar in appearance. When students learn to discriminate between very similar words, they are much less likely to confuse similar words when they read. Teachers should start with very easy match-to-sample tasks and progress over time to more difficult tasks. Teachers should also invent different kinds of match-to-sample games and flashcard games to help students generalize what they learn and make learning more interesting. Flashcard activities work best when the words are taken from the readers and other reading material that students actually use in class.



An easy match-to-sample activity



A harder match-to-sample activity

Fluency

When students read more fluently, they comprehend much better, Students read more fluently when they have a good sight vocabulary and good decoding skills. However, teachers should not wait until those skills have developed before they begin to teach comprehension and fluency. Rather, these skills need to be taught gradually as students begin to learn to read. There is a multitude of strategies for encouraging fluency and teaching comprehension (*see* Snow *et al*,1998; Vaughn et al, 2000; Robinson, 2001; Westwood, 1997). However, listening to students read frequently and regularly, provides the teacher with many opportunities to prompt, correct and praise and to model (demonstrate) fluent reading. Teachers should try to arrange for all students with literacy difficulties to read to them for a few minutes each day. In doing so, teachers should use a pause, prompt, praise strategy (*see* Westwood, 1997 pp. 128-9):

- when a student struggles with a word, **pause** to let them try to work it out
- **prompt** the correct pronunciation if the student can't work it out after a few seconds, by asking the student to check the words around it and helping the student with the beginning sound etc.
- **praise** the student if they then get it right; or provide the correct word, have the student say it, **praise** the student for saying it right, and move on.

When listening to students read, teachers should always read some first to model good reading, then ask the student to read some, then read some more to the student, and so on. In this way, the teacher demonstrates good, fluent reading.

Teachers can also train peer tutors or recruit volunteer helpers to help with listening to students read, but tutors and volunteers should always be trained by the teacher in how to pause, prompt and praise, and how to take turns at modeling and listening.

Another excellent strategy for building fluency is repeated reading. Students read the same book or passage several times until they become very fluent in reading it, instead of always going straight on to a new book. Not only does this method build confidence but it also familiarizes students with reading more fluently. In effect, students model fluent reading for themselves.

Students should be reading material that is at their instructional level; that is, not too easy, but not too hard. Trying to read material that is too hard is frustrating for the student, and likely to reduce, rather than improve, their chance of becoming a better reader. Teachers can take a record of a student's reading accuracy and fluency to determine whether certain reading material is really at the student's instructional level:

Taking A Record of Reading Accuracy

(Adapted from NSW Department of School Education (1997). Teaching Reading: A K-6 Framework).

1. Select a part of a student's reader that has not previously been attempted by the student.

2. Allow time for the student to read the page unassisted before testing.

3. Ask the student to read for one minute – do not prompt or provide any assistance.

4. Record each error on a separate form with a stroke: | | | | | |

5. If the student self-corrects without any prompting, cross the stroke: | | ✗ ✗ | |

	Example
6. Count the total number of words read after one minute	80
7. Count the number of errors (don't count the self-corrections)	6
8. Calculate the number of words read correctly	80 – 6 = 74
9. Calculate the accuracy level as a percentage	$\frac{74}{80}$ x 100 = **93%**

As a very general rule, accuracy rates should be considered as follows:

Easy	95 – 100%
Instructional	90 – 94%
Frustrating	<90%

Comprehension

One of the more important developments in reading research over recent decades has been the new emphasis in teaching comprehension. For a long time teachers have tested comprehension (in fact a lot of testing right across the different curriculum areas has really been a form of reading comprehension testing) but not taught comprehension, or comprehension strategies, explicitly. For students with learning difficulties to develop good reading comprehension strategies, these strategies need to be taught.

There are at least four levels of comprehension (Westwood, 1997, pp. 129-130):

- *literal comprehension* – recognizing the main idea, understanding the words, understanding literal cause and effect, understanding literal sequence
- *interpretation* – inferring, reading `between the lines', drawing conclusions
- *critical reading* – judgment about the quality, value, accuracy or truthfulness of what is read
- *creative reading* – the reader goes beyond the writer's material and generates new ideas from it

Basic strategies for teaching comprehension to students with literacy difficulties include:

- frequent opportunities for reading text
- direct instruction in comprehension strategies
- cooperative learning activities in which students discuss the meanings and their interpretations of texts

Teachers should model comprehension strategies in order to teach them, as follows (*adapted from* Westwood, 1997, p. 131):

- preview material before reading it
- find the main idea in a paragraph
- ask questions (to self) about the paragraph
- make predictions about what comes next
- summarize the material.

A simple strategy for helping students to progress from literal comprehension to interpretation is to model, prompt and teach students to ask the question as they read a paragraph and attempt comprehension questions, *Is the answer right there in the book, or in my head?* Retelling stories and summarizing stories or passages are excellent ways in which students can learn and practice comprehension, and teachers can model these activities.

For other comprehension strategies (in detail), see Snow *et al* (1998), Vaughn *et al* (2000), Robinson (2001) and Westwood (1997).

Adapting the Curriculum – Numeracy Difficulties

Numeracy, like literacy, is a highly valued set of academic skills. Parents usually expect their children to become competent in mathematics at school, and even students with moderate to severe intellectual disabilities are usually involved in some kind of mathematics program. Students with learning difficulties usually struggle to some extent with mathematics and their difficulties can be very obvious to parents, other students and themselves. As a result, students with mathematics difficulties often display poor self-esteem, low confidence and a reluctance to attempt or practice mathematics activities. Effective teachers try to identify students' mathematics difficulties as early as possible, for that reason, and also try to respond to any existing need. Students with mathematics difficulties respond well to corrective methods and all student teachers need to develop skills in responding to the needs of students with mathematics difficulties.

What kinds of mathematics difficulties are students likely to experience?

Performance in mathematics is clearly influenced by two main factors – individual characteristics and education (including home and community influences).

Individual Influences

Students with intellectual disability, learning difficulties, and a number of other disabilities are likely to find difficulty with mathematics or with just some aspects of mathematics. Other students just have difficulty with mathematics, although such students may also have difficulties with logical reasoning and other mathematics-related skills. On the other hand, some students who struggle with reading, language, and some other aspects of the school curriculum, are surprisingly competent in mathematics, especially numeracy. Kosc (1981; cited in Vaughn *et al*, 2000, p. 434) suggests three variables that may influence an individual's performance in mathematics:

i. Cognitive and Neuropsychological Factors

Intelligence, ability to sustain attention, and cognitive learning strategies may all influence a student's progress in mathematics. Students also, often have specific difficulties, such as *spatial awareness* problems and memory problems. Researchers also continue to investigate the degree to which an individual's memory is influenced by their educational experiences, just as they continue to investigate how memory influences learning.

Students with poor spatial awareness can have difficulties with relative position *(i.e.,* they might have trouble working out concepts like above, below, beside, behind etc.), distances, measurement and working out *abstract relationships*, such as geometric drawings, perspective, and so on.

Students with memory problems might not be able to learn number facts (*e.g.,* addition facts, multiplication tables, number patterns) easily, especially if their instruction doesn't include appropriate levels of practice and drill.

ii. Personality factors

Attitude is a major influence in students' approaches to, and performance in, mathematics. Some students simply believe that they can't do mathematics, whilst others just don't seem to like it. Student behaviour can influence performance in mathematics, while poor behaviour and problems with attention can be a consequence of a student's difficulties with mathematics. Teachers should note that students' attitude to mathematics can be heavily affected by the quality and type of instruction they have received in mathematics.

In addition, teachers should also consider the needs of students with disabilities other than learning difficulties. Students with more severe intellectual disability are likely to have great difficulty learning mathematics skills and concepts, so teachers need to consider only the most essential numeracy skills required for daily living for these students, such as operations with money and trading concepts, and quantities for food preparation. Students with some physical or sensory impairments may also require modification of curriculum goals and instruction. For example, blind students have great difficulty with concepts such as perspective, horizon and so on, and also cannot memorize the visual number patterns that sighted people use. Blind students need other ways of remembering and recognizing number patterns, so teachers use abacuses and other adapted devices to help these students.

iii. Educational Influences

There has been much debate about whether students need a highly structured approach to learn all the many skills of mathematics, or whether a good mathematics programs should use discovery learning and other constructive techniques to encourage students to *think mathematically*. Researchers have found that students with numeracy difficulties often haven't been provided with ample practice in basic, essential skills, such as addition facts, number patterns, multiplication facts, and so on. On the other hand, researchers have also found that some students are well able to perform basic number operations but have very poor problem-solving skills. Researchers have also found that students who have been provided with mathematics instruction consisting largely of drill and number operations can be unmotivated. Westwood (1997, pp. 167-8) lists the instructional characteristics that can disadvantage students with mathematics difficulties:

- The teacher presents work that is too far ahead of the student's ability or knowledge, so the student falls behind and loses confidence
- The teacher has not structured their discovery learning mathematics activities to provide enough practice, and the teacher has not followed up the activity to check learning and provide additional information and practice
- The teacher has used concepts and terms that the student cannot comprehend

- The teacher has not used concrete materials and practical activities to reinforce and assist students, or has stopped using them too early in the student's development
- Because the student has difficulty with problem-solving, and language-related activities, the teacher just gives the student a `diet' of algorithms and computational exercises, so the student does not learn how to apply their mathematics skills, and their mathematics learning isn't meaningful
- The teacher has progressed their teaching according to the calendar or schedule, instead of monitoring their student's performance, using corrective feedback and moving forward when the students' have grasped the concepts and skills that the teacher intended them to learn
- The teacher has not provided enough revision, so once a concept or skill has been taught, the teacher has assumed that the students will always remember it and remember how to use it. The teacher has forgotten that a mathematics program should be provided as a *spiral* so that all topics and skills are revisited from time to time

> Less effective teaching of mathematics is characterized by infrequent review and revision, demonstrations which are too brief or unclear, insufficient guided practice, and too little corrective feedback. *Rosenshine, 1986, cited in Westwood, 1997, p. 168*

How can the mathematics curriculum be adapted so that students with numeracy difficulties can learn more effectively?

Mathematics cannot be taught effectively to all students through incidental teaching, and mathematics cannot be taught effectively by just teaching number operations and algorisms. Effective teachers take a balanced approach to teaching mathematics.

Providing the Right Content at the Right Time

Students perform better when the teacher has high expectations, unless the teacher's expectations are simply too high. When teaching students with learning difficulties, it is important that teachers have high expectations of what students can be taught to achieve but it is also important that teachers have a realistic idea of what students need to learn and can be taught with the resources and time available. Teachers need to identify what content is essential and then find the right way to teach that essential content; having an attitude that the student will learn the skill if the teacher can find the right way to teach it. For students with significant learning difficulties or intellectual disability, teachers should emphasize only those skills that are required for daily living. MacDonald (1979, cited in Robinson, 2001, pp. 212-3) suggests that the following mathematics skills are the most important for daily living:

- a structural understanding of whole numbers
- basic number facts of addition, subtraction, multiplication and division
- an ability to analyze and solve practical problems involving money, distance, measurement (including quantities) and time

While it is important that teachers focus on essential skills for students with difficulties, and provide plenty of demonstration and guided practice in those skills, it is just as important to focus on skills that students recognize as useful and important to them. For this reason, teachers should utilize materials and situations that are drawn from students' daily lives. For example, food items, cooking equipment, tools, toys and other things that students use daily should be used in mathematics learning activities that demonstrate to students how mathematics is used to solve realistic, daily problems.

If the teacher moves ahead too quickly for some students, then those students will not learn. On the other hand, if the teacher moves forward on the curriculum too slowly, then the students will not learn anything new. In order to present the right content *at the right time*, teachers must monitor and record their students' progress. Having a list of the skills to be taught and keeping a record of what students are up to is the simplest way to do this. Another simple technique is keeping samples of students' work in a folder. This type of record-keeping is called keeping a *portfolio* of a student's work. Usually, students can keep their own portfolio and teachers simply need to review the portfolio from time to time. Teachers should check their students' progress regularly and as often as necessary to have a good idea of what students are up to. A quick weekly check of progress works very well and a teacher can easily check each student's progress once per week

Teachers should always adopt a *mastery learning* approach to teaching essential skills in mathematics. This means that the teacher should never move on to the next skill or concept until the student has mastered the current skill or concept that he or she is working on. Most researchers and practitioners suggest that mastery is achieved when the student scores above 80% on that particular skill or concept. For example, if a student completes 20 simple addition exercises of the same type and achieves a success rate of over 16/20, then the teacher can assume that the student has mastered that particular skill. Teachers should remember though that mastery can be lost again if the student is not given ample opportunities to revise mastered skills from time to time.

Marbles, nuts or pebbles make good counters for demonstrating number facts

Finding Out What the Student Needs

Assessing a student with difficulties' current performance level is very important. Westwood (1997, pp. 172-3) provides an excellent guide for finding a student's level:

Level 1

If the student's performance in basic number is very poor, consider the following points. At this stage almost all the assessments will need to be made at an individual level, using appropriate concrete material such as toys, found materials, pictures and number cards.

Check the student's grasp of vocabulary associated with number relationships (*e.g.,* `bigger than', `altogether', `less', `share' *etc*.)

Then check the following knowledge and skills in the following order. Can the student:

1. sort objects given one attribute (colour, size, shape etc.)?
2. sort objects given two attributes?
3. produce equal sets of objects by one-to-one matching?
4. count correctly objects to ten? To twenty?
5. recognize numerals to ten? To twenty?
6. place number symbols in correct sequence to ten? To twenty?
7. write numerals correctly to ten? To twenty?
8. understand ordinal values *(e.g.*, fifth, tenth, second *etc*)?
9. perform simple addition with numbers below ten in written form (*e.g.,* 3 + 5 =)? With or without concrete materials?
10. perform subtraction with numbers below ten, in written form?
11. count-on in a simple addition problem?
12. answer simple oral problems involving addition or subtraction with numbers below ten?
13. recognize all coins and money notes?

Level 2

If the student's performance in mathematics is slightly better than Level 1, consider the following areas. Can the student:

1. carry out simple mental addition with numbers below twenty?
2. carry out simple mental problem-solving without use of finger-counting?
3. carry out simple subtraction mentally?
4. perform both vertical and horizontal forms of simple addition
   e.g., 3 and 3 + 5 =
   +5
5. understand the commutative law in addition (*i.e.,* that the order of items to be totaled does not matter)? Does the child see that 3 + 5 and 5 + 3 will give the same total?
6. understand additive composition (*i.e.*, all the ways of getting a set total, *e.g.,* 5 is 4 + 1, 3 + 2, 2 + 3, 1 + 4, 5 + 0)?
7. understand the complementary or reversible character of addition and subtraction (*e.g.,* 7 + 3 = 10, 10 – 7 = 3, 10 – 3 = 7)?
8. watch an operation demonstrated using concrete material and then record it in written form?
9. translate a written equation into a practical demonstration (*e.g.*, use sticks to demonstrate 12 – 4 = 8)?
10. listen to a simple real-life situation described in words and then work the problem in written form (using numbers below twenty)?
11. recognize and write numerals to fifty?
12. tell the time?
13. name the days of the week?
14. name the months of the year?

Level 3
If the student is able to succeed with most items in the previous levels, consider these questions. Can the student:

1. read and write numerals to 100? Read and write sums of money?
2. halve or double numbers mentally?
3. add money mentally? Work out change mentally?
4. recite the multiplication tables and answer random table facts?
5. perform addition algorisms with H T U without carrying? With carrying?
6. understand place value with H T U?
7. perform subtraction algorisms without exchanging? With exchanging?
8. perform multiplication algorisms?
9. perform division algorisms?
10. recognize fractions: ½ , ¼ , 3 ½, 7 ¼, 0.8, 5.9 *etc*.?
11. read and interpret simple word-problems?

Providing the Right Amount of Information and Practice
Discovery learning and problem-solving approaches to mathematics teaching can help make mathematics more fun and more meaningful for students. However, for students with difficulties in mathematics, these approaches have to be supplemented with additional instruction, drill and practice. For example, a student learning to perform basic addition operations might only come across one instance of an addition operation once in a problem, and the student has to work out at the same time, what the problem is, what the words mean, what sort of arithmetic is required, and so on. For a student with mathematics difficulties, this style of instruction is not enough. The student with mathematics difficulties will need a number of clear demonstrations of how to do addition operations and plenty of guided practice in that particular skill. It is important that students do not just do arithmetic operations all the time (they need to engage in discovery learning activities and problem solving too) but they must have plenty of clear, explicit instruction in all mathematics skills and concepts and they must be given plenty of guided practice.

Fluency in number facts and mathematical operations is very similar to fluency in reading. Fluency leads to greater understanding and comprehension, and the student has a much better chance of being able to apply the skills they have mastered. To build fluency in mental arithmetic and other operations in numeracy, there is probably nothing better than a daily speed and accuracy exercise. Using either a worksheet, a chalkboard or oral questions, a student or a group of students is required to complete a number of algorisms or simple mathematics exercises daily. The specific items are changed daily but their level of difficulty is maintained or only increased gradually, and students try to complete the exercises in as short a time as possible. ***Teachers should note, though, that fluency exercises should not be used as a student's total mathematics program; students must be applying their skills to real-life situations as often as possible.***

Students with mathematics difficulties need mathematics to be taught in a way that allows them to master one skill or concept at a time, so that they only proceed to the next skill or concept when they have mastered the previous one. Mathematics skills, especially numeracy, tend to be hierarchical. This helps teachers to organize their teaching targets into an easy-to-hard sequence and to keep good track of where students are up to *(see Robinson, 2001, p. 217 for an example of an addition hierarchy*).

Quality Instruction That the Students Understand
Effective teachers have the philosophy that ***all of their students will learn when they find the right way to teach them***. Quality instruction is simply instruction that works. The best instruction in the world becomes the worst instruction if it does not teach the students. There are

styles of instruction that are usually effective in teaching mathematics skills and concepts (and other curriculum skills too!) to students with learning difficulties, however (although, teachers should always be prepared to experiment and explore ways of finding new instructional techniques for their students):

i. *Explicit Instruction*

Explicit instruction is direct teaching. The teacher tells the student, or demonstrates to the student, exactly what they want the student to learn. The student is not left to discover the skill or concept themselves and the teacher does not simply hope that the student will `pick it up'. Teachers should arrange some practical discovery-learning experiences in which the student can apply the skills already learned but discovery-learning is not a useful technique for teaching new skills or concepts to students with learning difficulties. Explicit instruction is generally much more effective for students with difficulties. Explicit instruction involves demonstrating to the student what they need to know, checking their learning through guided practice, and revising that learning later to make sure that the knowledge is being maintained.

Explicit instruction also includes steps to facilitate *generalization.* Students learn and practice their skills and concepts with different sorts of materials and in different contexts so that they learn that the same skill, concept or definition applies in different applications and with different things. For example, it is important that students do not learn to count and recognize number patterns by just using blocks or counters all the time. The effective teacher changes the materials from time to time so that the students perform similar operations with nuts, sticks, food items, marks on paper, and so on. The teacher also changes the problems that are set to different kinds of problems, so that the student learns to apply their skills in different contexts.

Effective teachers also utilize good concepts instruction, which involves demonstrating the breadth or range of a concept. Note the following example:

A Teaching Sequence to Introduce the Concept `Under'

The line is *under* the word	big
The 4 is *under* the 6	6 4
The 3 is *not under* 5	35
The ball is *not under* the moon	
The grass is *under* the tree	
The snail is *under* his shell	

The teacher uses different examples to demonstrate the concept *under*, and a range of *non-examples* to show what isn't *under*. In a real classroom, the teacher would use real objects as well as written material to demonstrate concepts like *under*.

Explicit instruction also involves the teacher teaching explicit strategies to students. For example, how does a student learn how to solve problems? How do they know what steps to

take? How do they know what kind of mathematics operation to use? Fast learners will often make up their own strategy through a process of logical reasoning and practice but students with difficulties need strategies to be taught to them explicitly. The RAVE CCC strategy described by Westwood (1997, p. 184) is a useful one for students with difficulties:

RAVE CCC Problem-Solving Strategy

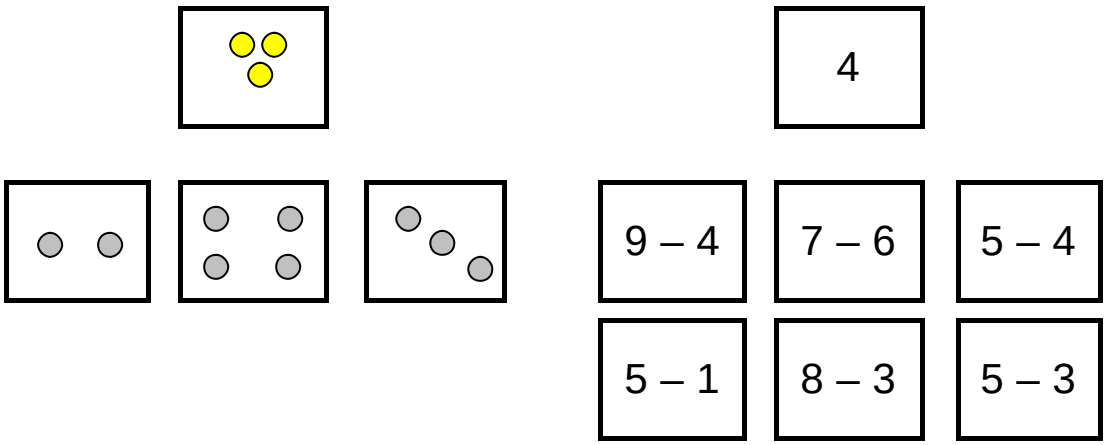
R Read the problem carefully
A Attend to key words which may suggest the process to use (*e.g.,* share, less than)
V Visualize the problem (you may even make a sketch or diagram)
E Estimate the possible answer

C Choose the numbers to use
C Calculate your answer
C Check your answer against your estimate

ii. Easy-to-hard Sequences

The skills and concepts in mathematics are usually *hierarchical*, that is, there are hierarchical sequences in skill areas such as addition, subtraction, geometry, and so on, in which the sequence starts with simple, easy skills (*e.g.*, 1 + 1 or plain 2-dimensional shapes) and moves on to much harder, more complex skills (*e.g.*, K250.76 + K54.00 + K6,776.31 or complex, 3-dimensional layered shapes). Teachers using a mastery learning approach can use this feature of mathematics to advantage because they can always begin with easier skills or concepts and move gradually to harder ones. Note that the assessment schedule described above (Westwood, 1997) is laid out in an easy-to-hard sequence.

Match-to-sample techniques are very useful for teaching mathematics skills and concepts in easy-to-hard sequences. The principle of match-to-sample is very simple and can be used with concrete materials and flashcards, or on worksheets, chalkboards, and so on. A *sample* is presented to a student and the student has to choose a matching item from a range of items (it's a multiple-choice technique). The more similar the range of items are to each other, the harder the exercise is for the student. Match-to-sample is an excellent strategy for teaching students to recognize number patterns, associate numerals with words, identify shapes, and so



Examples of different match-to-sample teaching arrays

on. In fact, different match-to-sample techniques can be used to teach or reinforce most skills and concepts in school-level mathematics. Match-to-sample techniques are very valuable for teaching students with learning difficulties because it is a very clear form of instruction and very gradual changes in level of difficulty can be arranged.

iii. Using Concrete Materials

Many mathematics skills, particularly algorisms, have been taught without much use of concrete materials. Many students learn reasonably effectively in this way. However, students with learning or specific mathematics difficulties are not likely to. Teachers should always use blocks, sticks, nuts, counters or any other suitable concrete materials to clearly demonstrate mathematics operations. The concepts of *carrying* and *exchanging* in arithmetic are abstract concepts that students often find very confusing. Concrete materials should always be used to demonstrate and revise these skills, and it is important that demonstrations are repeated frequently. Students must also perform these operations with concrete materials. Students can easily gather materials to do this (*e.g., leaves, sticks, stones, shells)* but they need guided practice as they learn to perform the operations. It is important that students see how written algorisms are simply a code for practical operations with real objects.

iv. Making Mathematics Fun and Purposeful

If students are given a diet of just drill and practice in mathematics, they will not be motivated and they are not likely to be successful, even though the skills being taught and practiced may be just what they need. Like all other students, students with difficulties learn more effectively when they work with other students in cooperative, meaningful activities. A good mathematics program for students with difficulties has a good balance of cooperative learning, practical activities and some individual or small group drill and practice. Effective teachers always build in some individual teaching and monitoring as well. Mathematics provides students and adults with practical, useful skills that can be very enjoyable to learn and use. It is essential that teachers try to make sure that students with difficulties have enjoyable mathematics learning experiences so that, even though they may struggle sometimes, they remain interested, motivated and confident. Mathematics games can be an excellent learning tool and teachers should build up a pool of mathematics games and fun ideas for teaching mathematics. Even intensive drill and practice can be fun for a few minutes each day if it is provided in the form of a game.

v. Using and Giving Feedback

Teachers need to know what their students are up to. This is especially true of students with difficulties as they need instruction that is arranged to meet their needs. Simple monitoring systems (as *described* earlier) assist the teacher to keep in touch with the learning progress of these students. However, it is also important that teachers keep students informed of their learning progress. Students need to know what is expected of them, how they are going and what to do next (what to aim for). In this way, students remain focused on the important skills that the teacher aims to teach them and they also begin to take greater control of their own learning. Like most people, *students need to know where they are going and where they have been.* Teachers should praise students when they have demonstrated some progress, provide guidance when they need it and inform students of what they need to work towards. Effective teachers keep students informed of their learning progress.

vi. Revision and Guided Practice

Once a student has learnt a skill or concept, they need to practice it and revise it to achieve mastery and to retain the skill. If students are simply left to practice learned skills, they may begin to simply practice mistakes. If this continues, all their previous learning can be undone. Students need to be guided through practice and teachers need to monitor their students' practice to make sure that students remain on the right track.

Revision is equally important. Even once students have mastered certain skills or concepts, they need to revise their learning from time to time. Teachers should always make sure that students revise material throughout each year. Giving students set tasks and problems to solve in cooperative learning activities can be an excellent way to do this. Providing games that reinforce certain skills is another excellent method. Effective teachers always make sure that their schedule for each school term contains plenty of revision of material; especially for students with difficulties.

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