systems applications
and
tasmanian special education

graduating

1986

CONTENTS

ABSTRACT

The education of disabled children in Tasmania, as in many other places, is characterized by a lack of co-ordination, ad hoc decision making and reactiveness. These dysfunctions could be remedied if there were, among teachers and administrators, a general orientation to the application of systems concepts.

This orientation is nothing more than a particular way of thinking about problems and finding solutions to them. The systems approach permits decision makers to examine, analyse and plan solutions for problems found in the field of special education.

The first chapter of this paper is a description of the development and structure of special education provisions in Tasmania. The history is largely responsible for the present unco-ordinated situation which is so much in need of a more rational approach.

The paper then proceeds to a discussion of the nature of systems. A system can be thought of as a set of objects and the relationships among them, all operating together for the benefit of the whole. Within each system is a number of sub-systems while each system is itself a sub-system of a bigger and more complex system. The parts of a system and its dimensions (closed/open, static/dynamic) are discussed along with a brief mention of models of systems.

There are various types of systems, each being able to fulfull a certain purpose or meet a particular goal. They range in complexity from simple taxonomies, through hierarchies, transformation operations and branching systems to the concept of the feedback loop and reflect, in order, an increasing capacity to promote understanding of the real

world of people.

For a systems approach to be taken in special education, there are underlying assumptions which need to be identified and problem solving implications of which a practitioner needs to be aware. Some of these are discussed in Chapter III, along with some dysfunctions which Wolfensburger regards as typically present in those special education provisions which lack a systems approach.

Having used illustrations mainly from his own experience in Tasmania to suggest that special education would benefit from a greater orientation to systems, the writer describes five applications of systems approaches in Australia and the U.S. Some of these applications are already functioning while others are blueprints easily transferred to the real world. They include a system of principles, a decision making model and the development of curricula.

Chapter V is a description of two specific management techniques using systems concepts (PPBS and PERT) and thoughts on how they were used/ could have been used/could be used to improve the management of special education in this state.

The writer's conclusion is that, despite some excellent field work in Tasmania, the education of disabled children is marred by a lack of cohesion and a lack of planning. This situation could be changed by the adoption of systems concepts. Some very recent developments give cause to hope that this is happening.

SPECIAL EDUCATION IN TASMANIA

In May, 1979, the Review Committee on Special Education in Tasmania was established by the State's Director-General of Education to:

- determine an appropriate definition for special education in Tasmania;

- examine the present nature and extent of education services in Tasmania for people with special needs; and

- recommend and advise on any necessary revision and development of those services.

The committee was required to present its report by 30th. October, 1980. The report was not complete until nearly three years after that date.

One of the reasons for the delay was the unexpected difficulty encountered by the committee in its attempt to describe the current situation. The committee discovered a situation which was characterized by confusion, an unwillingness to divulge information, a lack of knowledge and a lack of co-ordination. The attempt to describe the total picture proved more difficult than was imagined when the committee was established.

At the beginning of the 1980s, Tasmanian special education was complex and unco-ordinated. The history of the growth of education provision for disabled children explains much of this situation.

A. HISTORY

The early (from 1828) special schools in Tasmania were for orphans and neglected children. Private citizens, as well as governments, were involved.

In 1867, legislation was passed to encourage voluntary agencies to establish reformatories and industrial schools. Later, the government established similar schools of its own and conflict developed between the two systems. To one system, children were objects of charity; to the other, they were individuals with a right to help from the community as a whole.

The early special schools were for children with environmental or social disabilities. The next stage (from 1887) was the provision of facilities for physically disabled pupils. In what was to become a recurring pattern, these facilities

1. were established by a voluntary organization;
2. later were supported to some extent by the government;
3. later still, were provided by the government with teachers;
4. are now schools which are the responsibility of the state Education Department.

The schools were established for the education of children with particular primary handicapping conditions. Names, administrative structures and location have changed but the present schools emerging from the second stage are:

Lady Rowallen School (Hobart) for hearing impaired children;

Bruce Hamilton School (Hobart) for visually impaired children;

St. Giles School (Launceston) for physically disabled children;

D'Alton School (Hobart) for physically disabled children.

The third stage (from 1919) was the growth of facilities for intellectually disabled pupils. Two major forces brought about this growth. The Education Department's Chief Psychologist established schools and classes which later became the Dora Turner School in Hobart and St. Michael's School

in Launceston.

The other major force was the Retarded Citizen's Welfare Association. In the pattern mentioned above, this association began many schools which are now the responsibility of the Education Department: Talire (Hobart), St. George's (Launceston), St. Martin's (Hobart), St. Paul's (Devonport), Willow Court (New Norfolk), West Park (Burnie), Huon (Ranelagh), Wentworth (Howrah), Channel (Snug) and Elphin Rise (Launceston).

Gradually, the Retarded Citizen's Welfare Association has withdrawn from the provision of education and become more involved in other aspects of retarded people's welfare.

During the 1970s, special units were established by the Department for pupils with truancy, adjustment and behavioural problems - Albuera Street, E12, Nangaree, Alma Street (all in the south of the state) and Canning Street (Launceston).

A number of special classes appeared in many high, district and (to a lesser extent) primary schools in the 1960s and 1970s. These were meant to provide "slow learners" with the opportunity to develop skills and attitudes which, given their limited abilities, they would need either later in their school lives or when they left school. They were unlikely to attain these skills and attitudes in the regular academic classes.

These special classes were extremely varied and the success depended on factors such as:

- the support of the principal,

- the attitude of other staff members,

- the nature of the pupils in the class,

- the physical environment,

- the availability of suitable learning resources, and

- most of all, the personality or skill of the teacher responsible for the class.

As the idea of "mainstreaming" gained in credence and popularity in the late 1970s and early 1980s, many special classes disappeared.

The statewide administration of special education in Tasmania has undergone several changes throughout the past century and a half. Individual officers (such as the Chief Psychologist already mentioned) have made a significant input into the growth of services; others have made little.

In the 1960s and early 1970s, the overall administration of special education was the smallest portfolio of a designated Director (e.g. Director of Primary, Area and Special Education). A Supervisor of Special Education assisted the director. In 1977, a Superintendent of Special Education was appointed and make directly subordinate to the Deputy Director General.

The growth of special education services in Tasmania was the result of the laudable efforts of individual and voluntary agencies, rather than the result of government policy and educational planning. This accounts for much of the confusion and territoriality which faced the Review Committee in 1979.

B. <u>THE PRESENT SITUATION</u>

In 1981, 5516 children received special education in Tasmania, the vast majority of them in ordinary classes with support in classroom or for short-term withdrawal. 743 pupils attended the 17[1] special schools then in operation. These schools had a total teaching staff of nearly 100.

1985, there are 16[1] special schools, the reduction being caused by the closure of St. Andrew's College (Launceston) in 1982. This closure was precipitated by a dispute between the R.C.W.A. (the owner of the school building) and the Education Department (the employer of the teachers).

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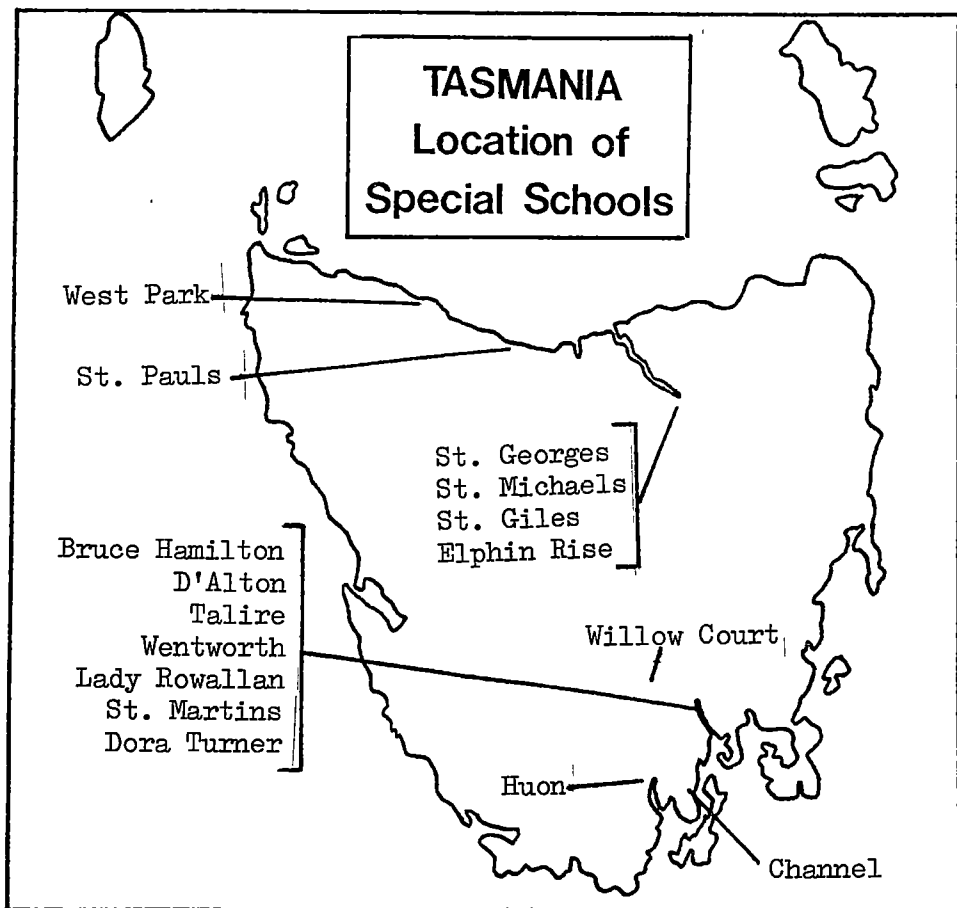
1. These numbers do not include the school on Cape Barren Island. Although it is officially classed as a special school, this school differs significantly from the other special schools and is really a small, isolated primary school.
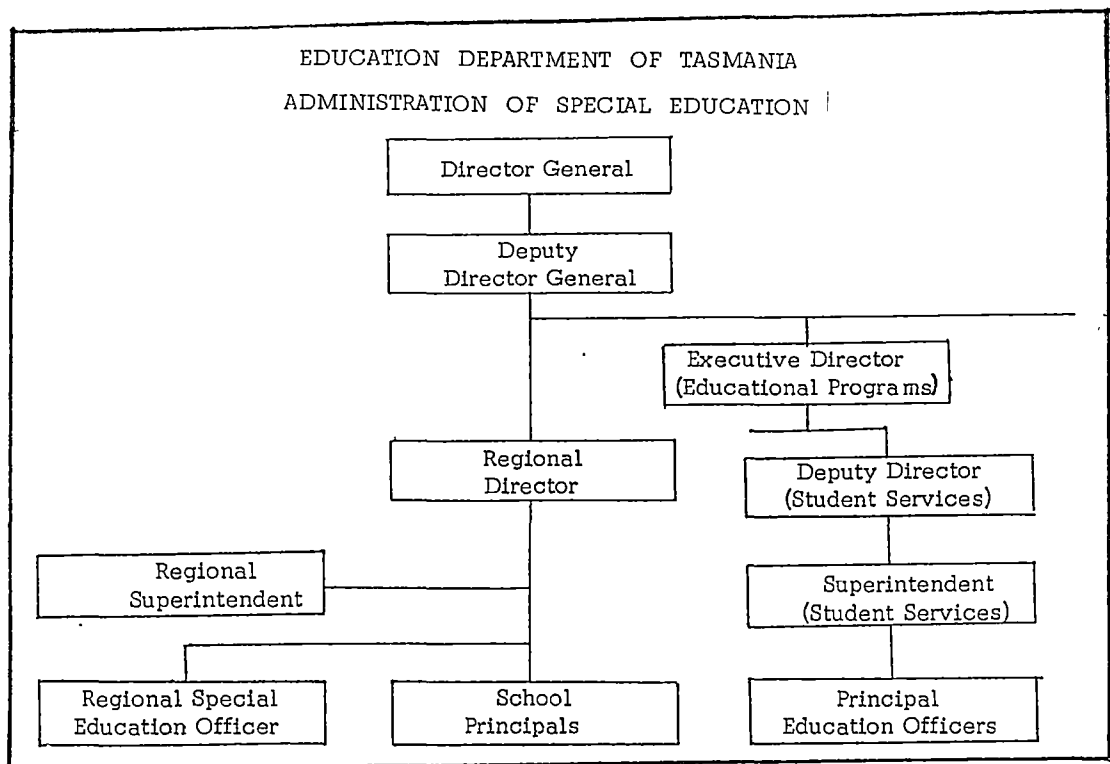
Recent developments have seen the extension of special education
services:

- early intervention programs,

- post compulsory school age education,

- programs for severely disabled children,

- programs for language disordered pupils,

- special units in a few primary and high schools,

- provisions for children in hospital,

- itinerant teacher services for sensorily impaired children,

- programs for children in residential care.

These services have been provided, in the main, in response to very
obvious and urgent needs or to pressure from some quarter. They did not
come about as the result of a deliberate or clear policy of the government
or the Education Department.

The need for an improvement in the state and regional administration
of special education has long been evident and was acknowledged in both
A Review of Special Education (Education Department, 1983, Section 16.2) and
Review of Efficiency and Effectiveness of the Education Department,
(Hughes, 1982, Recommendation 12.1, 12.21, 12.22, 14.20).

The administrative structure now in place (as recommended by Professor
Hughes) is clearer and more rational than its predecessor. It means that
information and authority are no longer centred around one officer (the
former Superintendent of Special Education), that the ever increasing work
load has been shared among several officers with expertise in different areas,
and that responsibilities can be identified.

EDUCATION DEPARTMENT OF TASMANIA
ADMINISTRATION OF SPECIAL EDUCATION

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                        ┌─────────────────┐
                        │ Director General│
                        └─────────────────┘
                        ┌─────────────────┐
                        │     Deputy      │
                        │Director General │
                        └─────────────────┘
                                    ┌──────────────────────┐
                                    │  Executive Director  │
                                    │(Educational Programs)│
                                    └──────────────────────┘
                ┌─────────────────┐ ┌──────────────────────┐
                │    Regional     │ │  Deputy Director     │
                │    Director     │ │  (Student Services)  │
                └─────────────────┘ └──────────────────────┘
┌─────────────────┐                 ┌──────────────────────┐
│    Regional     │                 │    Superintendent    │
│  Superintendent │                 │  (Student Services)  │
└─────────────────┘                 └──────────────────────┘
┌─────────────────┐ ┌─────────────┐ ┌──────────────────────┐
│ Regional Special│ │   School    │ │      Principal       │
│ Education Officer│ │ Principals  │ │  Education Officers  │
└─────────────────┘ └─────────────┘ └──────────────────────┘
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Statewide policies regarding special education have been "understood" rather than stated or planned. There has been little evidence of an understanding of the long term implications of any major policy. In the White Paper on Tasmanian Schools and Colleges in the 1980s is included the first public attempt to enunciate some special education policies. There is, for example, mention of the Government's policy of integration –

"It has adopted this policy because it believes it is the best one." (White Paper......, 1981, p. 37)

Such a policy is laudable and seemingly straightforward but......

- the government does not explain what it means by "integration."

- there is no indication that the Government understands that integration is not an end in itself but a means to bring about a desired change in pupil behaviour.

- the practice is that any school which succeeds in integrating its disabled pupils is likely to be penalized by loss of funding and staffing.

The Review Committee had this to say on the subject (1982, p.4)

> "Policy in Tasmania is based on the general belief that it is preferable
> to educate most children together, whether they have special needs or
> not, and that it is possible to provide suitable special facilities
> and effective special services for them in the ordinary school
> environment. However, the concept of 'integration' or 'mainstreaming'
> which is at the heart of this approach carries with it numerous problems
> in providing support services at the required level."

In the past few decades, special education in Tasmania has not
functioned efficiently and effectively. It has been complex and unco-
ordinated. Many of the reasons for this are historically based and reflect
the growth of education provisions for disabled children.

Dysfunctions which are present in Tasmanian special education are not
unique to this situation. They are all too frequently in evidence where
an ad hoc, unco-ordinated and piece-meal approach is taken in human services.
These typical dysfunctions are discussed at some length in Chapter III (c)
of this paper.

Recent and expected developments will make necessary a greater degree
of policy enunciation, forward planning and general co-ordination in
Tasmanian special education. For many years, the main issues have been
integration, segregation, early intervention and, more recently, the rights
of disabled people. Debate about these issues has frequently been ill informed
and resulted in practices which range from excellent to bizarre.

Two important emerging issues in special education are educational
management and curriculum development. A further issue is the education of
gifted and talented children.

In the interests of children needing special education services and of
the people whose task it is to provide these services in a changing economic
environment, it is desirable that the evolutionary process be hastened to

some extent.

It is the writer's conviction that a systems approach is the best way to ensure that children with special needs receive the most suitable education.

SYSTEMS

System approaches are organized ways of thinking about problems and finding solutions to them. They are ways of thinking about total systems and their components.

For an educator, these systems will include state or school administration an education philosophy, curriculum development, the learning process and an invididual pupil.

Before particular systems can be considered, however, the general nature of systems must be investigated.

A.   WHAT IS A SYSTEM?

A system can be thought of as a set of objects and the relationships among them.

The relationships are seen as no less important than the objects themselves and are stressed by writers on the subject.

> "Systems are made of sets of components that work together for the overall objective of the whole." (Churchman, 1968, p. 274)

> "A system (is) a network of inter-related procedures." (Fitzgerald, 1973, p. 5)

> "An operational system synthesizes and inter-relates the components of a process within a conceptual framework ensuring continuous, orderly and effective process toward a stated goal." (Heinrich, 1966, p. 603)

By using words such as "overall," "network," "framework" and "synthesizes," the writers are also stressing the wholeness or totality of a system. The components interact in ways which may be designed to achieve certain ends.

Such systems can range from one as simple as, say a light switch through to more complex systems such as a dandelion or a motor car to one

as complicated as a political system. They include a state-wide education
system or one of its sub-systems, such as the provision of special
education.

Educators might feel uncomfortable with mathematical models or might
view the systems domain as dehumanizing. There is about the systems approach,
however, a logical and lucid philosophy which is clearly applicable to any
problem-solving process. Furthermore, social considerations can be included
in any systems model. As Thome and Willard put it,

> "The systems approach is an orderly way of appraising a human
> need of a complex nature, in a 'let's-stand-back-and-look-at-
> this-situation-from-all-its-angles' frame of mind."
> (Thome and Willard, 1973, p. 212)

This approach can prevent fragmentation of a field by bringing its
components into a total relationship with each other. The broad views
involved in the design of a system allow for crossing of traditional
boundaries which might otherwise have operations and specialists working
against each other. Certainly an area such as special education, with all
its potential for fragmentation into professional, political and other
components could benefit from an approach which makes possible a common
purpose and a unified effort.

Sub-Systems

All systems, no matter how all-encompassing, are themselves sub-systems
of other systems.

The circulatory system, for example, is a sub-system of the
body of a man (another system) who, in turn, is part of a number of
social systems.

A Tasmanian special school (a system) is a sub-system of
special education which is a sub-system of education, a
sub-system of the state's society.

There is a continuum of systems, starting with sub-atomic systems and
ending with the universe and beyond, with each system on it being a sub-
system of the next.

Within a system, the individual sub-systems interact with each other.
The performance of one sub-system interacts with other sub-systems and
hence it cannot be designed in isolation from these other sub-systems.
Outputs from one sub-system become inputs of another.

As sub-systems interact and as systems are sub-systems of other systems,
it is apparent that systems interact. Tasmanian special education is a
system which interacts with all other social systems in the state.

B.   PARTS OF A SYSTEM

A system has   1)   elements,

2)   relationships, and

3)   attributes.

1) In this paper, elements have also been called objects and
components. Other synonomous terms are entities and nodes.

Elements in a motor car system include the engine, chassis,
wheels and fuel.

Elements in a solar system include stars, planets and their
satellites.

Elements in a school system include pupils, teachers, buildings and books.

2) The relationships are connections or transactions among the elements.

In a solar system, the link between a planet and its satellite is a relationship.

In a school system, the communication which takes place between two staff members is a relationship.

3) The attributes (or qualities or characteristics) of the elements would include:

The age, sex and ailment of a patient in a hospital system.

The decor, power and seating capacity in a motor car system.

The qualifications and stature of the teachers in a school system.

A system may be represented in a number of ways: a drawing, an equation, a physical model, a verbal description. A map is a representation of a system of which several towns are elements, the highways connecting them are relationships and details of population and industry are attributes of the elements.

C. DIMENSIONS OF A SYSTEM

Systems are often clarified into two categories:

1) A closed system is one which automatically controls or modifies its own operation by responding to data generated by the system itself. Such a system has very clear boundaries. An example is a heater with a thermostat which automatically switches on or off the source of heat. Another such system is a photocopying machine

which switches itself off when its paper supply is exhausted.

2) An open system is one which does not provide for its own control
or modification. It is subject to external influence and may need
supervision. A household radiator will continue heating it until
some person intervenes and switches it off. A collator will
continue operating, even when there are no more papers to collate,
until somebody outside the system switches it off; nor will it
start operating unless someone switches it on.

A closed system, then, is controlled on an automatic basis, while an
open system is controlled by a person (or people) as circumstances suggest.

The four examples given are simple, mechanical systems but the same
principles apply among more complex systems. Each type is suitable for
different operations. For instance, one element (and sub-system) of a
special school is the accounting procedure. An account is received and,
as the result of a procedure, a cheque is forwarded. The procedure is
automatic and is not affected by the time of day, the weather, the colour
of the office walls or any other feature outside the system. Once the
procedure is established, it should operate automatically. On the other
hand, the teaching and learning processes are affected by many external
forces and, like most systems in the real world of people, are open systems.
The environment has an impact on the elements and the elements have a
mechanism for leaving the system.

Another way to consider systems is as static or dynamic. The former
type has no adaption-change or feedback mechanism, while the latter has the
capacity for change and modification.

"Living" systems are open and dynamic. Such a system

> "maintains itself in a continuous inflow and outflow, a building
> up and a breaking down of components, never being, so long as
> it is alive, in a state of.....equilibrium but maintained in a
> so called steady state." (Bertalanffy, 1968, p. 38)

D. SYSTEMS MODELS

A model is a representation of a system; it is an abstraction, simplification or idealization of the system. It helps to describe or (in a sense) duplicate the system but it cannot replace the real world.

Several different types of models may be used to represent systems:

physical model (e.g. a model plane)

physical-analogue model (e.g. a model of a molecule using rods and balls)

schematic model (e.g. flow diagram, organization chart, map)

mathematical model (e.g. $Y = C + I$: an equation used to describe national income).

The value of a model can be judged by its contribution to our understanding of the system it represents.

E. TYPES OF SYSTEMS

There are at least five different types of systems and each type reflects, in order, an increasing capacity to handle complexities in the real world. Each can fulfill a different purpose or meet a different goal.

1) Taxonomies

A taxonomy is a classification system by which an observer can organize information into a meaningful and useful context. Data is classified

according to   -   natural relationships

                  -   certain principles

and such classifications have been used in all the sciences. It might be argued that a science begins with a taxonomy which organizes the known information in the field.

In the field of education, two well known taxonomies are those by Bloom who classified cognitive and affective attributes.

Until the late 1970s, the only statewide taxonomy in Tasmanian special schools was the classification of the type of primary disability of pupils attending each school. Thus, there are schools for children who are visually impaired, hearing impaired or physically disabled, or are mildly, moderately or severely intellectually disabled. In ordinary schools, the classification was two fold:

    - pupils who needed special education provisions

    - pupils who did not need them.

Such taxonomies helped special education to develop the way it has. More recently, that type of simplistic labelling has given way a little to a more functional approach which acknowledges the needs of pupils as well as their disabilities. This development follows a decade or more behind overseas experience.

Writers such as Dunn (1968) have suggested a functional taxonomy for special education with eight broad areas:

a) environmental modifications
b) motor development
c) sensory and perceptual training
d) cognitive and language development, including academic instruction
e) speech and communication training
f) personality (or connative) development
g) social interaction training
h) vocational training

If such a classification were to be adopted in Tasmania, teacher education, school organization and curricula could be based on a total scheme which emphasizes areas of learning. While the present taxonomy continues to be generally applied, the state's teacher training institutions will continue educating teachers about handicapping conditions instead of about learning and schools will continue to ignore priorities among learning needs.

> "Special education currently finds itself dissatisfied with its
> present structures, searching for a more useful, meaningful and
> functional taxonomy system."
> (Lerner and James, 1973, p. 279)

2) Hierarchical Systems

A hierarchy is a particular form of taxomic classification. It is helpful in that it can be used for organizing information within a discipline.
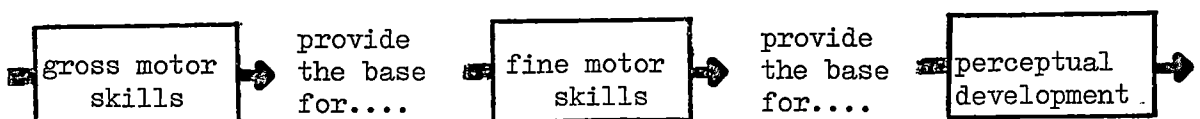
The elements of hierarchical system are structured according to some increasing attribute of the elements. Each element is dependent on a previous element.

Two well known hierarchies in education are

- Piaget's Stages of Intellectual Development and

- Erikson's Stages of Psycho-social Development,

both of which have been considerable contributions to our knowledge of child development.

The visuo-motor system is an example of a hierarchy of significance in special education:

gross motor skills → provide the base for.... → fine motor skills → provide the base for.... → perceptual development →

Another example of a hierarchy which has played its part in special education is Myklebust's (1965) hierarchy of man's language system.

The levels he describes are:

> experience
> inner language
> auditory-receptive language (listening)
> auditory-expressive language (speaking)
> visual-receptive language (reading)
> visual-expressive language (writing)
> verbal symbolic behaviour

Much of this approach now can be seriously questioned but it has been useful for teachers seeking to understand the relationships among elements of language.

A hierarchical system becomes dependent on cognitive processes and is static. The relationships must remain constant since there can be no mechanism for change. While it can be useful in ordering information, a hierarchy is a limited and simplistic type of system.

3)   Transformation Operation Systems

This kind of system is sometimes called the "black box concept." The "black box" is used to group information which cannot be considered in detail. An observer can see that input is transformed into output by a process which takes place within the "black box." He is less concerned with how the transformation takes place than he is that it takes place.
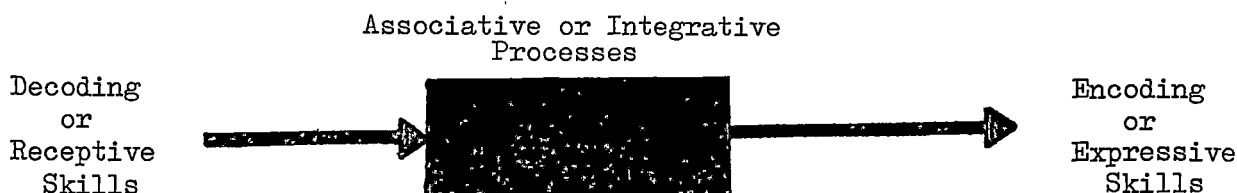
Black Box
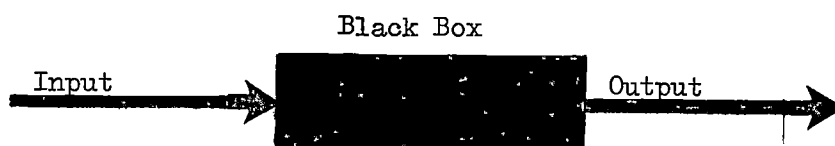
Input   →   Output   →

A computer is an example of a transformational operation system; it has input, central processing and output. The user does not need to know much about the processing stage for him to benefit from it.

The black box concept is a very useful one in special education. Many changes are brought about in pupil behaviour without anybody being completely aware of how the changes took place: a non-reader acquires some reading skill, a clumsy child learns to catch a softball, a mal-adjusted student learns to control his outbursts. A teacher (or physiotherapist or guidance officer) can manipulate an environment so that these changes take place. It is not yet possible, however, to perceive exactly _how_ they take place.

As researchers gain more insight into the learning processes, it will be possible to more closely analyse the transformations. In the meantime, teachers can make sure of the fact that outcomes of the system are affected by input.

Behaviour-modification theories can be readily viewed as black box systems. Aetiological factors are ignored; a reinforcement unit becomes an input; the pupil converts that input into desired behaviour (the output). We cannot see how the child (the conversion device) brings about the change; we can see only that he does bring it about.

The model underlying the Illinois Test of Psycholinguistic Abilities (ITPA) relies on the transformational operation to analyse psycholinguistic processes:

Associative or Integrative
Processes

Decoding
or
Receptive
Skills

Encoding
or
Expressive
Skills

A diagnostician using ITPA is required to determine whether a child's disability is related to input, output or integration. A teacher can then make use of this information in designing a remediation program.

While the inability of the use of the system to analyse all details of the transformation is a restriction, it would be foolish to ignore this type of system. It cannot provide all the answers; it is not ideal; it does, however, lead us to more complex system types which more closely resemble the real world.

4) Decision-Tree Branching Systems

A family tree is an example of a branching system, a way of showing the relationships among elements within a system. The nodes (elements) indicate grandparents, parents, children, etc.

A decision tree is another type of branching system. The critical nodes in this case are decision blocks where transformation take place. The decision block becomes a sorter; it distinguishes among inputs and indicates action for each:
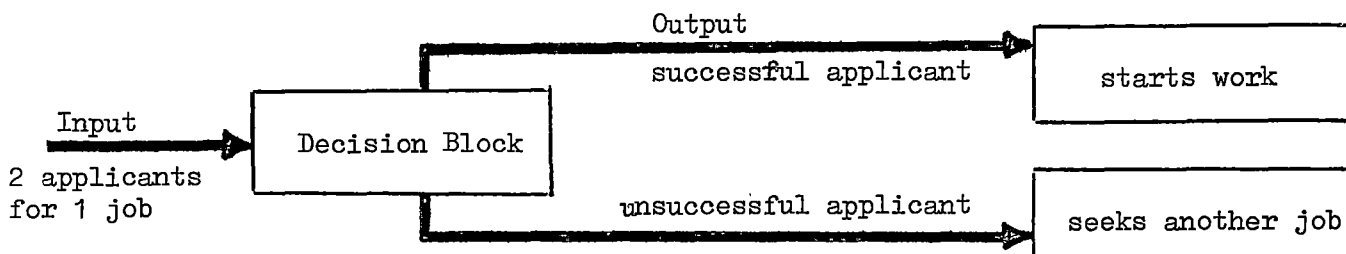
Decision blocks in the tree indicate where a choice is made among different possible courses of action. These decisions provide alternative pathways for the system to function. For example, if a pupil is having difficulties with the academic work with which she is confronted in an ordinary classroom, decisions must be made about her future education. The alternatives may be represented by the continuous lines in this diagram:
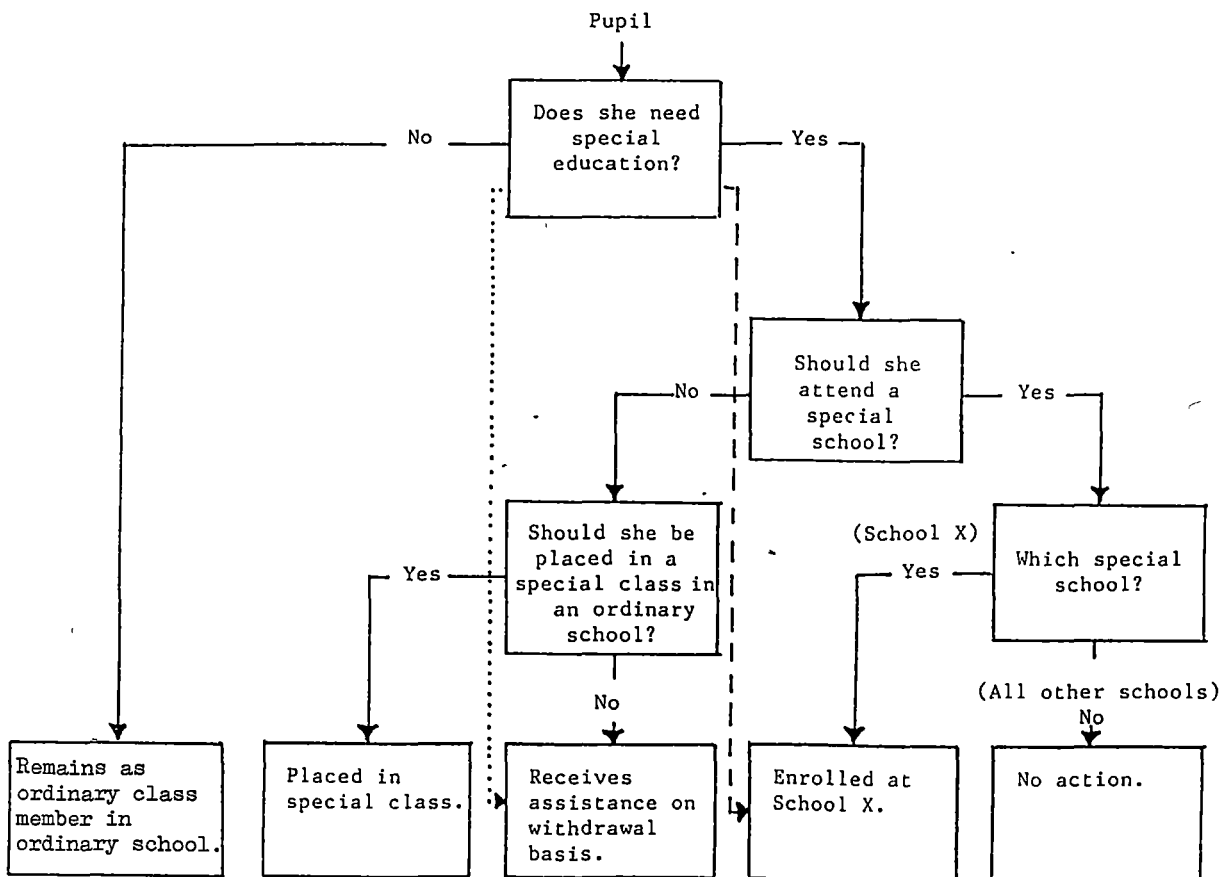
For the decision-making process to be truly systemic, a pathway
should be followed consciously and deliberately. In the past, the practice
in Tasmania has sometimes been to place a pupil with learning problems in
a particular special school with undue haste, ignoring decision blocks on
the way. The line of dashes on the above diagram indicates the route
taken in such a case.

In the past few years, the pendulum has swung excessively in the other
direction. Concepts such as "integration" and "mainstreaming" have become
fashionable though not necessarily understood or practised. Decisions
have been to keep pupils in ordinary classes or ordinary schools regardless
of the real needs of the children or the adequacy of provisions in those
classes or schools. Again, decision blocks have been bypassed; the line
of dots on the diagram indicates one such route.

The interests of disabled pupils will be much better protected if a
branching system is used deliberately when decisions are being made about
placement.

The above diagram represents an ideal situation, of course. For
instance, parental permission for special school placement might not be
given or space might not be available at School X. In such cases, the
decision makers should follow the pathway which is both possible and least
inappropriate. The principles of the branching system remain sound.

Another use for branching systems in special education is the increasing
role of computer technology. Computers have a part to play in diagnosis,
curriculum planning (especially Individual Education Programs) and teaching
as well as in administrative areas. A decade and half ago, special educators
at John Hopkins University (Mark, 1969) urged more intensive study of

systems-analysis procedures to exploit computer technology, to promote
research efforts, and to further the state of the art in special education.
Advances since then are suprisingly small, especially outside the U.S.A.

The use of decision-tree branching systems makes possible the mapping
of logical processes on a flow chart, thereby increasing the system's
capacity to analyse problems.

5) Corrective Operations: The Concept of the Feedback Loop

The feedback loop enables a system to change, to learn and to correct
itself. It indicates whether or not the system is achieving what it seeks
to achieve.

There are four basic elements in a feedback system:

>   input

>   transformation

>   output

>   feedback mechanism

The output is monitored and compared with input. Errors provide
information which becomes input for the system and this makes correction
possible on the subsequent cycle. The feedback loop operates as a
servomechanism, allowing the system to make an evaluation of itself and to
maintain its steady state.

One application of the feedback loop in special education has been described by Kephart (1971, p. 108). He uses it to illustrate the way in which a child learns a perceptual-motor process:

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┌─────────┐      ┌──────────────────┐      ┌─────────┐
│  Input  │─────▶│   Integration    │─────▶│ Output  │
│         │      │ (present and past│      │         │
└─────────┘      └──────────────────┘      └─────────┘
     ▲                                           │
     │            Feedback Loop                  ▼
     └───────────────────────────────┐     ┌─────────┐
                                      │     │Muscular │
                                      │     │Response │
                                      │     └─────────┘
```
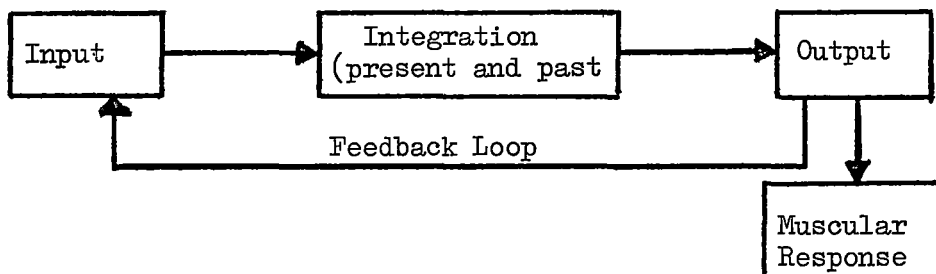
The perceptual input becomes an output which is partly muscular response and partly information which is fed back into the system. This information becomes part of the input for the next cycle of the system. This pattern continues until input matches output and perceptual and motor actions become very closely related to each other.

Clinical teaching is another example of corrective operations in special education. Certain teaching procedures are adopted (input) resulting in a two-part output. One part is the child's acquired learning. The other part is information about the way the child is learning and this information becomes input affecting the next teaching decision.

"Feedback is an essential part of any learning system because memory, error, correction, and control are dependent upon it. A system that includes a feedback mechanism makes use of one of the higher-order systems, and its sophictication takes us one step closer to the real world."
(Lerner and James, 1973, p. 85)

▌▌▌ CHARACTERISTICS OF A SYSTEMS APPROACH IN SPECIAL EDUCATION

Throughout this paper, consideration is given to a number of applications of systems approaches in special education. Such applications have certain assumptions underlying them and certain implications for problem-solving. An attempt will be made in the section to identify these assumptions and implications.

A. UNDERLYING ASSUMPTIONS

1) Issues, problems and processes are not seen as unique, isolated or coming about purely by chance. They are seen as lawful, interrealated, multi-dimensional, universal and part of a larger set.

There is a lawfulness in human relationships which requires a higher level of perception than mere observation of phenomena. An understanding of these laws makes easier the understanding of an even prediction of an preparation for the phenomena. It will allow for the influencing of phenomena instead of simple reaction.

Issues which emerge in Tasmanian special education will not be unique but will be at least somewhat similar to those which have emerged or are emerging elsewhere. Because experience in Tasmania tends to be preceded by experience in the United Kingdom and U.S.A., practitioners in this state are in a position to learn from that overseas experience, provided that it is acknowledged that the issues are universal. For example, Tasmania could take advantage of Brennan's (1979) findings about the effect of "mainstreaming disabled pupils in British schools.

A process such as the decision to staff a special school with a number of teachers is not to be seen in isolation. The process is related to many other issues in a larger scene - quality, training and availability of teachers

funding; the role of the school in the community and among other schools; the nature and availability of support services (such as speech pathology and social work).

Events in special education seldom, if ever, come about purely by chance. The aetiology of disability is discussed at length in teacher education institutions and among professional practitioners. Less time, however, is devoted to a real debate about the causes of dysfunctions in teaching and management. An assumption of a systems approach is that events are brought about deliberately and that they can be influenced.

2) Special education provisions do not exist in isolation: they are a multi-component, multi-level complex system. They are affected by most trends and operations within a total education system and an even wider social system.

The education process which goes on in a special class or a special school is part of a system which includes:

- schools (buildings, pupils, staff, parents),
- administrative procedures,
- research in education (not just in special education),
- education reports,
- attitudes to integration,
- services (curriculum, guidance, teacher development etc.)
- the national and state economy.

The relationship between special education and these other components is an interactive one. Just as they influence special education, special education affects them - they are all sub-systems within a wider system.

B.   PROBLEM SOLVING IMPLICATIONS

A systems approach implies a reflexive orientation........

- to the hidden complexity of phenomena

- to the fact that phenomena are apt to be multi-causal,

  multi-dimensional and multi-component

- to problem solving which is complex, multi-pathway and yet

simultaneous.

A systems approach can lead to improved problem solving, some implications for which are listed:

1) <u>Rationality and Objectivity Can Capitalize Upon Lawful Causality</u>

Because of the universality of events and their causes, a decision maker in one setting is able to make rational, objective decisions based on experiences in another setting. The "mainstreaming" example already mentioned is a case in point: Brennan's findings in the hands of a systems-oriented decision maker should mean that certain conditions would be created in Tasmanian high schools and primary schools before"mainstreaming" was claimed as a genuine alternative to special schooling. It is irrational to repeat the experience of the British schools.

2) <u>There Can Be An Orientation to Anticipatory, or at Least Early Responding in Lieu of Reactiveness</u>

Human behaviour is predictable to a considerable degree and somebody operating within a wide time/space range is able to use this fact to avoid crises.

In Tasmania, aides are appointed to work in ordinary schools with individual pupils needing special education. It is predictable that such an aide would soon realize that she is not equipped for the task; the teacher with whom she is associated is not equipped to assist (otherwise, the aide would probably not have been appointed). The alternatives for the aide would be: resign, continue working ineptly, receive training. Only the third is a satisfactory alternative but for suitable training to be available,

decisions and preparations need to have been made well in advance. Reactiveness would mean that the first two would be the only alternatives in many cases and neither of these would meet the needs of pupils.

3)   Problem-Solving Can Be Aimed At Causes Rather Than at Manifestations

It has been traditional for special educators to study some of the aeteological aspects of disability but for this not to be translated into teaching practice. Behaviour modification is an important part of special education but sometimes a wider perspective is called for. Attempts to modify behaviour (e.g. improve reading skills, maintenance of self control) will fail in many cases unless the conditions which brought about the problem are considered.

For some time, the parents and teachers of one particular pupil of a Tasmanian special school were concerned about her disruptive and destructive behaviour at home and at school. All attempts to change this behaviour has been unsuccessful. Then, early in 1982, staff members began teaching the girl and her classmates a form of sign language which has been devised for use by moderately and severely retarded children. Within a few weeks, there were changes in her behaviour which were almost unbelievable - she started smiling, became quiet and co-operative, developed friendships and started contributing to class activities. Previous attempts to change this pupil's behaviour were aimed at the behaviour itself. The successful attempt required a broader view which revealed the cause of the behaviour - she had been unable to communicate with her family, her teacher and her classmates and her frustration was being manifested in disruptive behaviour.

4)   There Can Be a Commitment to a Long-Term Perspective

Two difficult and often unanswerable questions frequently asked of special educators by the parents of disabled children are "What will happen to my child when he leaves school?" and "What will happen to him when I die?"

For their own peace of mind and for the sake of their families, such parents try to take a long-term view of their children's future.

A systems approach in special education would mean that these questions could receive more satisfactory answers. It is this writer's belief that the responsibilities of special education administrators should be broader and include accommodation (several schools have about half their pupils living away from home), early intervention programs and post-schooling activities. More than with other students, disabled young people need to be prepared for specific aspects of adult life including employment, accommodation and leisure. While the provision of employment, for instance, is not the role of special educators, careful preparation of students for suitable employment certainly is.

Long term planning is needed if adequate special education facilities are to be provided. A systems approach allows for short term plans to be developed within long term policies and can eliminate some of the cost of duplications and changes of direction which characterise so much of special education.

It is possible to predict that, say, ten years from now, there will be a certain number of Downs Syndrome children of school age in Tasmania and that a certain number of physically disabled children will need accommodation so that they can attend suitable schools. The needs of such pupils can be anticipated and prepared for.

5) The Emphasis Can be Systemic Rather Than on the Clinical Tools of Problem Assessment

The "medical model" has long been an important technique in special education, both in teaching and in administration. This involves the identification of a specific problem, the diagnosis of the problem and

then its "treatment." A teaching example would be "b-d confusion" in a
pupil's reading; in administration, the appointment of an aide to assist
a class teacher with a "difficult" child.

While a pupil is a sub-system of an education system, he is also a
system himself. He has physical, social, emotional and intellectual
sub-systems, all of which interact. He has strengths as well as
weaknesses. He is a great deal more than a child with a particular
primary handicapping condition. An assessment procedure which is limited
to only one aspect of a child's behaviour is likely to ignore not only
other aspects but the way in which those aspects impinge on that one
under consideration. The same can be said about any remediation technique.

Until 1985, one Tasmanian special school concentrated its work on
one aspect of its pupils' learning – language development. Programs were
highly structured and individualized and related almost entirely to reading,
writing and talking. Little attention was paid to pupils' emotional, social
and physical needs. As a result, attempts to integrate some of these pupils
into a local high school were jeopardized – they lacked the social skills
and emotional stability needed in a school less sheltered than the special
school.

1985 has seen, however, a slight change in the school's program and
the pupils' wider needs are being considered. The outcome of future
integration efforts will be noted with interest.

Clinical methods have a role to play in special education, but if the
clinician is system oriented, the results of his efforts will probably
be greater than if he restricted his attention to a specific sub-system.

6)   <u>There Can Be Differentiation Among Aims, Objectives and Means</u>

A systems approach implies a measure of planning not presently common

in special education. This planning requires clear understanding of

aspiration and direction. The more clearly aims, objectives and means are

articulated the more likely they are to be related to each other and

actively pursued.

Mainstreaming of disabled pupils from special education is too often

understood as an end to be achieved. As a result, placement of such a

pupil in an ordinary class can be seen as the culmination of a special

educator's taks. In fact, mainstreaming (sometimes euphemistically and

inaccurately called "integration"), is no more than a means to bring about

normalization in a child's education and it is certainly not the only means.

The placement of a pupil in an ordinary class should be seen as a

step on the path to normalization. The special educator's task will not

have finished: it will, however, change. There will be new expectations,

new short term objectives, new techniques. These changes will have

implications for teaching, administrative and financial arrangements.

7)   <u>Problem-Solving Can Be Based on Clearcut Policies and Priorities</u>
Systems include the relationships among elements as well as the

elements themselves. A systems oriented special education administrator

will take into account many relevant factors when making decisions. He

will be aware of established policies and priorities which will impinge on

a given situation; any decision will not, therefore, be made in a vacuum

or be ad hoc but will be seen as part of a total scene. The decision will

also be less likely to be influenced by political or other non-educational

pressures.

If, for example, the provision of education for 16-18 years old intellectually disabled people were established as a high priority in a particular region of the state, many decisions about staffing, funding, buildings and other resources should be made with that priority in mind. Such a development would mean that developments of lower priority might be affected in some way. While that would be regretted or even opposed by people involved, the decisions would be made with the interests of the system in mind.

8)   Problem-Solving Can Be Multi-Dimensional and Multi-Path

If it is believed that a problem was brought about by only one cause, then it would be tempting to expect that remedying that cause would eliminate the problem. While single-causes and single-solutions might apply in very simple systems such as a light switch, human systems are much more complex. Problems in human systems are likely to have several interacting causes and require multi-path and multi-dimensional solutions.

A child's speech problem may not be rectified by some speech pathology each week. There may be emotional and health factors contributing to the problem and which need to be considered in the search for solutions.

If a school principal believes that an individual teacher needs to develop an aspect of his professional skill, it is probably not enough simply to enrol him for a short seminar. Other pathways to be followed at the same time might be a long term course of formal study, counselling, provision of reading material, opportunities to work in some way with more competent teachers, threats even! Another path might be to change the teacher's responsibilities so that his weakness is not exposed but his strengths are utilized in the interest of the school.

9) <u>Planning and Problem Solving Can Be Shared and Open</u>

A systems approach to special education requires a consideration of all aspects of a complex organization and it is unlikely that one person will have all the necessary knowledge. Such an approach requires the involvement of many people in planning and problem solving. These people will provide information and opinions and if it is also their function to implement a decision they have helped formulate, are likely to be committed to its successful operation. As they will also be involved in whatever evaluation takes place and in subsequent decision making, a feedback mechanism applies and the decision making process improves.

This is not to say, of course, that the chief administrator does not have a special role to play. It is his function to initiate, co-ordinate and formalize the process.

In one Tasmanian special school, the staff became aware of the need to rationalize the organization of books and other resources available in the school. The services of a consultant were gained and she and the principal played significant parts in the changes which took place during subsequent months. Most of the work, however, was done by staff members - teachers in the planning and descriptive stages, aides in the routine tasks. Now that a resource centre has been established, staff are familiar with material available to them and have a commitment to ensure that the centre operates successfully in ways which meet their needs. Had all the work been done by "outsiders," it would probably have been done in a more orthodox manner and certainly would have been done more quickly; it might also have resulted in under-utilization of the resource centre.

10) <u>Because It Will Have a Clear Purpose, the Painful but Essential Course</u>
    <u>of Continuous Change Can Be Made Less Painful</u>

It is the nature of living systems to change continuously - either to
grow or to diminish. Social systems are such systems and within them
many forces will be operating at any time. Some of these forces encourage
rapid or dramatic change; others seek to slow down the rate of change.
Any change in a system will cause pain to some, if not all, its sub-systems
(individuals or factions). Costs, benefits, influence, security and
prospects are altered within and without the system as the system grows
or diminishes.

In an education system there are three alternative pathways to change:
- the system can deliberately plan its course and can move
  along it,

- the system can drift erratically along a course or

- the system can have a course imposed on it by external forces.

The least painful of these alternatives is the first. Many people
(elements) can contribute to the plan and have a stake in its outcomes;
changes of direction will not be sudden, great or unexpected; it will be
possible to perceive the distance travelled along a clear course and to
have an idea of the distance still to go; people can plan their lives with
a degree of security.

Change is often a painful experience but an approach which is oriented
to a total system, to planning and to rationality will result in less pain
than will an approach characterized by short term, ad hoc decision making
and reactive problem solving.

C) DYSFUNCTIONS TYPICALLY PRESENT IN SPECIAL EDUCATION PROVISIONS WITHOUT A SYSTEMS APPROACH

Wolfensberger[1] claims that where systems approaches are not taken in special education, certain dysfunctions are typically present:

1) Services Function in Isolation

Decisions made by agencies outside an education department sometimes have a significant effect on the education of disabled children. (An example frequently experienced is a significant change in a child's medication).

These decisions are usually made without consideration of educational matter and are sometimes not even communicated to people responsible for a child's education.

Even within an education department, the decisions and practices within one branch can be variance with those of another branch. When these variances affect the education of a disabled child the results can be dysfunctional or even disastrous.

2) Events and Changes Are Attributed to Chance

It is too simplistic to claim that events have occurred because of chance or because of a single person. There will be a multitude of variables which have established the preconditions for an event to happen or a change to come about.

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1. Where Wolfensberger's ideas are discussed in this paper, the writer uses handouts and notes from a seminar led by Wolfensberger in Sydney during July 1980, and his book, Normalization

The developments which have taken place in Tasmanian special education during the past decade did not come about solely because of the appointment of a Superintendent of Special Education. The change of Federal Government in 1972 and the creation of the Australian Schools Commission were significant factors in the developments (money became available for an increase in services and for the establishment of a specialist teacher education course in the state); a staffing agreement between the Education Department and the Tasmanian Teachers Federation and improved career possibilities were some of the other factors in the development. By no measure was chance or an individual responsible for growth during the 1970's and early 1980's.

A danger of believing that changes are brought about by chance or by one person is that no future changes will be anticipated or planned for. Professional development and initiative would be stifled.

3) <u>Trends and Forces are Seen in a Limited Context</u>.

Trends affecting special education are also affecting other areas of education, the whole field of human services - the whole community in fact.

Trends related to unemployment, computer technology, leisure activities, personal relationships and environmental concern have been apparent in the Tasmanian community for many years but there has been a reluctance among some special educators to consider the implications beyond their own students or to learn from other teachers' experience with other students.

Some communities experience these trends before others but they are seldom, if ever, unique, specific or purely local phenomena.

4)   There is Reactiveness and Crisis Orientation

Special education is particularly prone to "band aid" approaches -

being unprepared for events, reacting hurriedly with little awareness

that decisions will probably ensure another crisis; creating "slow

starvation" projects in response to unexpected pressures.

Many staffing arrangements in special education tend to be reactive

and doomed to ultimate frustration and failure. The appointment of aides

to work with disabled pupils in ordinary schools is such an example.

5)   Single-Path Problem-Solving is Evident

Because problems have more than one cause, they are unlikely to be

solved by a single response. If there is undue conflict on a school staff,

for example, the transfer of a junior teacher might not solve the problem.

A child with a learning disability is not likely to be helped by the simple

purchase of a new reading scheme - other factors, such as attitudes (pupils'

and teachers'), teacher skills, learning environment and past learning

experiences have to be considered.

6)   Planning is Secret and Unilateral

Special education is often a small part of an education department,

usually understaffed with administrators. This tends to concentrate the

decision making. One person, however, cannot possibly comprehend fully

or implement satisfactorily the complexities of a special education branch.

A great deal of information and effort is required for a multi-point,

multi-path procedure. Secrecy and non-involvement inevitably lead to

uncertainty, rumours, frustration, dissatisfaction and lower performance

levels.

7)   <u>Planning is Short-Range</u>

This is brought about because of all the points already listed;
planners react hurriedly and secretly to events for which they are not
prepared and which they perceive as affecting a very limited sphere.
Short-term planning tends to conflict with long-term planning mainly
because it is reactive rather than a deliberate action.

Several years ago there was concern that little special provision
was made for the education of maladjusted children in Tasmania. A
particular music teacher showed interest in learning more about music
therapy as a technique for use with such children. She was granted a
scholarship which enabled her to develop considerable therapy skills while
studying in Great Britain. Since her return, most of her teaching time has
been spent as a class teacher! She has been unable to make full use of the
skills which she acquired at so much expense. The whole episode has
resulted in very little benefit to the total system or, indeed, to many
of the state's maladjusted children.

8)   <u>Training is Present Oriented</u>

Teachers may be trained for the present rather than for the distant or
even foreseeable future. This narrowness of preparation can mean that the
disabled pupils of those teachers will be less prepared for their adult life
than is necessary.

For example, teachers are wary of microcomputers because of limited
contact with them so their pupils are likely to be ill prepared for this
equipment when it becomes common in households a few years from now. When
one considers that

i)   the future of severely disabled children is probably

more predictable than those of other children and that

ii) disabled children are likely to take longer than other

children to acquire knowledge,

it is special educators who should be leading the way in developments such as computer assisted learning and computer literacy. Teacher training ought to allow, in fact encourage, this to happen.

Much training for special educators, remains largely concerned with outmoded taxonomies and soon-to-be-outmoded clinical practices. In only a few areas is future-oriented curriculum development a significant aspect of a training course.

9) <u>There is No Commitment Relating to the Trauma of Change</u>

Change without pain (agony even) is impossible. So where there is no preparation for this pain, there will be defensiveness and resistance to change; there will be no understanding that, despite the short term difficulties, the long term benefits could be considerable.

During 1982, the trauma of closing a Tasmanian Special School was undertaken. The closure was not altogether unexpected but the Education Department's plan for its former students and staff were a surprise for many people involved (they were to become part of another special school; the principal of the closing school was to become a senior teacher in the other school). It is probable that the new arrangements will be more satisfactory than the previous ones, but the changes to the two schools were imposed in a way which could have led to confusion, insecurity and even bitterness.

A systemic approach to the changes would have ensured that social and psychological sub-systems were considered as well as those concerning pupil enrolment, staffing allocations and funding arrangements, the painful aspects of the changes might have been lessened and the whole process less dysfunctional.

10) Teachers and Administrators Become Process Fixated

If education is the bringing-about of change in pupil behaviour (in its widest sense), the outcomes of educational procedures should be the main concern of teachers and educational administrators. It frequently happens, however, that it is the procedure itself which receives most attention - teaching methods (e.g. individual programs, Montessori practices) materials (e.g. school mini-bus, reading kits) innovations (e.g. devices to enable physically disabled children to use a computer). Special education, with all its attendant gadgetry, is very prone to process-fixation and insufficient attention is paid to the learning which has taken place in pupils.

These dysfunctions no doubt apply to any organization in which a systems approach is not used. Unfortunately, they appear frequently in organizations which seek to provide suitable education for disabled children.

IV APPLICATION OF SYSTEMS CONCEPT IN SPECIAL EDUCATION

In previous chapters, various aspects of systems (such as ideal types, assumptions and implications) were illustrated by many examples from the writer's experience in special education. The illustrations were used to help explain points regarding the nature of systems.

The natural progression from a discussion of the concepts of systems is a consideration of the application of those concepts and that is the subject of this chapter.

The bulk of the chapter is a description of five applications of systems approaches in special education in Tasmania and elsewhere;

A. Wolfensberger's approach to the provision of human services for disabled people;

   He talks of the "Three Legs" of governance and operation

   - ideological and theoretical

   - legislative

   - implementive practices and structures and stresses the interdependence of them.

B. Hewitt's scheme for providing an education (especially in communication skills), for blind/deaf children;

   Such children have received little attention in the past, mainly because of their low numbers, and little curriculum development has taken place with their needs in mind. Hewitt is attempting to redress this situation.

C.   Proger's model for rational decision making, a rare phenomena in

     special education;

          Proger is appalled at what he sees as a "fiasco" and proposes

          a model which features overall co-ordination, data gathering,

          planning and long-range·decision-making mechanisms.

D.   Gunsburgs' system of principles underlying special education;

          As a replacement for the lack of cohesion which characterises

          so much of special education, H. and A. Gunsburg propose an

          operational philosophy which includes socialization,

          normalization and personalization.

E.   The development of a mathematics curriculum for intellectually

     disabled pupils in a Tasmanian special school;

          Special educators frequently must develop curricula to suit very

          specific contexts. An objectives model of curriculum development

          is appropriate in those areas which emphasize information and skills.

     In each of these examples of the application of systems concepts, both

the elements of the system and the relationships among them are significant;

in each case the relationships and the feedback mechanism make the processes

systemic. Each example is either a description of part of the real world,

(that is, the system is actually in operation) or is a model easily

transferred to the real world.

A.   THE "THREE LEGS" SYSTEMIC APPROACH

Special education is a sub-system of an education system but it is also a sub-system of human services - that is, all those services provided for disabled people (including health, education, housing, employment and recreation).

A leading designer of systems approaches in human services is Professor Wolf Wolfensberger of Syracuse University.[1] His plans make all service-providers aware of the whole system and of their place in it. He requires that the whole system be considered during any decision making process.

Compared with this approach, the practice in Tasmania leaves a great deal to be desired. Two cases in point:

- The writer was once involved in a discussion about the school placement of a child and claimed that, ignoring all other factors, it would be less expensive to pay taxi fares to enable him to attend a city special school rather than have him enrolled in the school in the grounds of a mental hospital. The response was that "We (Education Department) would have to pay the fare but at the (hospital) school, the expenses would be met by the Health Department."

- Funding for special schools has depended on negotiated political decisions, thus inevitably favouring the larger, Hobart schools regardless of the needs of each school or of the whole system.

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1.   See footnote page 35.

Wolfensberger points out that the elements of a human services system are not restricted to people, buildings, equipment and money and the relationships among them. They also include attitudes, ideas, theories and legislation.

He proposes a number of

"Key Principles to Incorporate into the

Governance and Operation

of Adaptive Modern Human Serivce Systems"

and arranges them into "Three Legs" of this governance and operation:

1) Ideological and Theoretical,

2) Legislative,

3) Implementive Practices and Structures.

He stresses the interdependence of the three legs by using the following diagram:
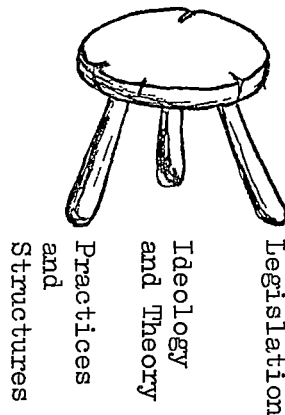
For the best service provisions, all legs have to exist and be obvious. Otherwise, the system will not function properly (the stool will fall down!) and the three need to be considered in the correct order. This order is, of course, a cyclical one with information from the third leg affecting the first leg and, ultimately the second leg. A more

traditional model of this system would be:

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                    ┌─────────────┐
                    │  Ideology   │
                    │ and Theory  │
                    └─────────────┘
      ┌─────────────┐               ┌─────────────┐
      │  Practices  │               │             │
      │and Structures│              │ Legislation │
      └─────────────┘               └─────────────┘
```
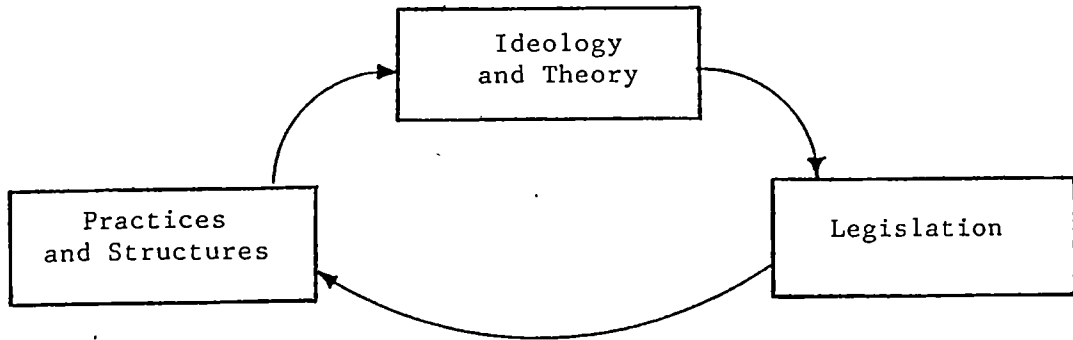
(The arrows indicate the direction of flow of material, energy and

information).

This provides a model coherence which seldom exists in special

education systems (or sub-systems) throughout the world.

If there is model coherence, all aspects of a system will add up to

a consistent whole. Wolfensberger would ask,

> "Are the right people working with the right people (who are
> grouped together in the right way,) using the right materials
> and methods in order to do the right thing?"

So that the answer to this question can be "Yes," Wolfensberger has

developed his Three Legs Systemic Approach. The principles he groups

in each leg are listed:

1) <u>Ideological and Theoretical</u>

   (a) Commitment to adaptive and humane ideologies

   e.g. - commitment to consciousness
          (conscious of "mission," conscious of where
          service is heading)

        - internalization of normalization
          (a little knowledge of normalization is not
          enough; implications of normalization are
          far-reaching)

- service comprehensiveness and continuity

- openness, non-defensiveness
  (sometimes at odds with professional ambition
  and ego)

- consumer and public participation
  (even while aware of potential dysfunctions)

(b) Orientation to systems approaches and decision theory
(in some ways, this orientation is initially more essential
than skills in such approaches).

2) Legislation

This leg must follow 1) because no law can guarantee a service if a

society has no wish to see it provided. If a person is required by

law to provide a service but lacks the proper ideology, that service

will not be provided as it should.

(a) Clear establishment of rightfulness of:

- major needed services,
- least restrictiveness,
- normalized delivery,
- continuity.

(b) Supportive and enabling legislation establishing:

- clear statutory goals,
- flexible regulatory powers,
- fixed responsibilities to assure services, and
  accountability for their quality,
- appropriately stratified and chained responsibility
  and authority, including regional sources and
  control of some funds,
- multiple options for regionalization, funding,
  governance and diversification of services.

(c) Systematization of legislation.

(d) Parsimonious and clear phrasing.

3) <u>Implementive Practices and Structures</u>

    (a) Implementive approach consistent with regional values (e.g. if there is not general acceptance of "mainstreaming," it should not be practised).

    (b) Appropriate size and shape of regions (e.g. provision of services for a very small group of disabled people might not be possible unless regional values are altered).

    (c) Firm exercises of national, state and regional powers and responsibilities, especially funding power.

    (d) Flexible and cost-beneficial governance and administrative structures.

    (e) Ongoing planning tied to governance and/or administration.

    (f) Comprehensiveness and continuity of services.

    (g) Rigorous application of normalization theory.

    (h) .Use of tools of change agency.

    (i) Self-renewal mechanisms and quality safeguards.

Various aspects of this third leg have obvious feedback implications which will affect the theory and ideology of human services. Thus the cycle continues.

B. <u>A SYSTEM FOR THE EDUCATION OF BLIND/DEAF CHILDREN</u>

    To define accurately the blind/deaf population is difficult as it involves a wide range of disabilities pertaining to vision and autition. These are sensory disabilities which are sometimes combined with other physical and neurological disabilities.

But whatever the exact number, there are not many blind/deaf children in any one city or region and, probably for this reason, their educational needs have received little attention. Comparatively little work has been done to provide them with a suitable education, even in communication skills. Few teachers have developed the necessary teaching techniques.

Past practice has been a mixture of techniques used for pupils who are blind, deaf, physically disabled or intellectually disabled (even if they, the blind/deaf pupils, are not retarded).

Assessment tools have been inadequate for the task of predicting language potential in severely sensorily disabled children.

In 1972, Heather Hewitt, a Victorian psychologist, set out to develop what she called a "schema" to ensure that such children received a suitable education, at least in language.

Her first major task was to identify a hierarchial language structure which culminated in the acquisition of natural gesture. The main purpose of a hierarchical system is to order information so that it can be used purposefully. So, that hierarchy was to become a sub-system of the schema – a system which amounts to a curriculum for a specific group of pupils.

Hewitt collated the work of Robbins, Myklebust, van Dijk and Piaget in the following way (1978, p. 82):

Robbins (Behavioural levels)	Myklebust (Behavioural levels)	van Dijk (Pre-language levels)	Piaget (Sensory Motor stages)
Non-symbolic	Sensation	Co-active movement	Stage 1 and 2
Non-symbolic	Perception	1. Co-active movement 2. Non-representational reference	Stage 3 and beginning of Stage 4
Non-symbolic	Imagery	Imitation	End Stage 4 and beginning of Stage 5
Proto-symbolic	Symbolization	Natural gesture	Stage 6 (Internal representation)
Symbolic	Conceptualization	Formal language	

To this she added her own experience with blind/deaf children and identified the following hierarchy of behaviour language levels:

Level 1. Sensation (non-symbolic behaviour)
    2. Perception (non-symbolic behaviour)
    3. Imagery (non-symbolic behaviour)
    4. Symbolization (proto-symbolic behaviour)
    5. Conceptualization (symbolic behaviour)

Hewitt described behaviour typical of each level. For example (from Level 2).

"By daily practice with the co-active exploration of objects, and engaging in routines associated with the development of self care skills, gradually meaning is attached to these objects and the child is able to interpret the situations in which the routines occur."
(1978, p. 83)

If, for instance, by means of co-active conditioning an eating routine is established, the child, on becoming aware that his mother is preparing to serve food, is able to anticipate the sequence and seats himself on his chair and reaches for his spoon, he has learned to interpret a specific situation.

The next step for Hewitt was to relate teaching techniques to the identified levels. For example (again from Level 2), an adult co-actively guides a child's hand and spoon from the plate to the child's mouth. As the movement becomes established, the adult gradually withdraws his own hand so that the child can act independently. Later, the child will be guided to understand that other people are also eating at the same table and imitation of a real life situation is encouraged. This approach leads to the next level - Imagery.

Having matched techniques to the levels of the hierarchy, Hewitt then put those techniques into action. She and others have now been using them for several years with considerable success.

One part of the output from the teaching node of the system is the learning acquired by the pupil. The other part is information which acts as a corrective mechanism (feedback). This information can re-enter the system at one of two places:

- at the matching node or
- at the original input point.

At either point, it will affect future decisions about the way the scheme operates.

The system can be represented thus:

```
                    ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
Dissatisfaction     │ Decision │   │ Hierarchy│   │ Matching │   │ Teaching │
with existing       │ that a   │   │ of behav-│   │ teaching │   │ strategies│
practice            │ new      │──▶│ ioural   │─▶ │ strategies│─▶│ put into │
              ─────▶│ approach │   │ language │   │ with     │   │ practice.│
              ┌────▶│ is needed.│   │ levels. │   │ levels.  │   │          │
              │     └──────────┘   └──────────┘   └──────────┘   └──────────┘
              │                                         ▲              │
              └──────────Feedback Loop─────────────────────────┐     │
                                                               ▼      ▼
                                                          ┌──────────┐
                                                          │ Pupil    │
                                                          │ Learning │
                                                          └──────────┘
```
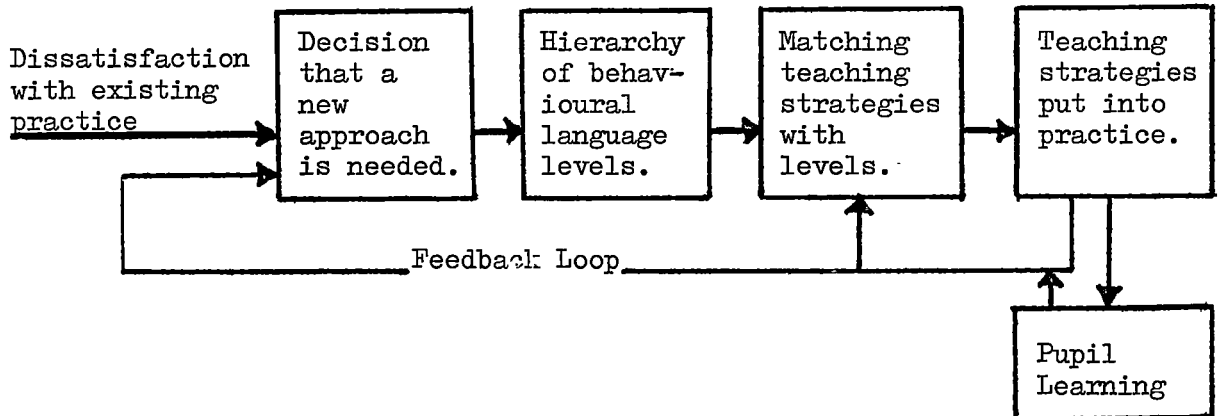
Hewitt's system approach has made it possible for a group of teachers

to move from a situation characterized by confusion, mismatching and

ad hoc decisions to one which has enabled a number of blind/deaf children

to receive an education more related to their needs.

C. A SYSTEM FOR DECISION MAKING

Proger (1977) proposed a model to remedy what he called the "decision-

making fiasco in special education." He was addressing an American

audience but the situation is not very different in Tasmania and the

principles of the model could well be applied in this state.

His proposal is a logical approach which could result in a rational,

soundly based and systemic decision-making process.

Proger begins by describing special education decision-making as being

arbitrary, not based on relevant data and devoid of long-range planning.

It is arbitrary because special education administration tends to be under staffed. Supervisors are generally over-extended in their day-to-day basic duties without worrying about gathering (or even using) data for decision-making, or engaging in long-range planning processes. The bases for decision are often:

- the amount of money available for the coming year,
- the pressures which are being applied at the moment, and
- the "empire-building syndrome."

Most crucial decisions are made in a defensive manner and it is not surprising that they tend to be quick and arbitrary.

The reason decision-making is usually not based on relevant data is that characteristically the collection of such data is a secondary (and therefore, less pressing) responsibility of the senior officer. If data is available, it is usually too late to be of help in decision-making. Then, too, most decision-makers do not know what types of data they need.[1]
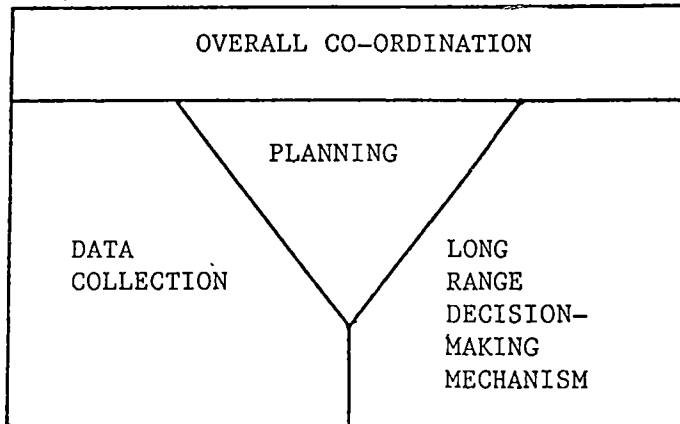
If planning occurs at all, claims Proger, it is usually of a short-range nature; how to respond to immediate pressures and bearing in mind the need to keep the system in existence for another year - the "bandaid" approach.

Administrators do not carry out a needs assessment for determining what the major problem areas of a program are. Nor do they have, in the main, a master plan of growth.

---

1. In Tasmania, the data collected is almost always restricted to facts about enrolments, staffing numbers and amounts of government finance. Little interest is shown in collecting data about programs, quality of staffing and a school's capacity for other funding. Using the wrong data then leads to poor decision making with actions unrelated to the (few) stated goals; successfully integrating schools are penalized and failing schools are rewarded with additional funds and staffing.

So, having discussed some symptoms of the "fiasco," he proposed a decision-making system which would allow for the production of long-range plans of growth and/or change which have a degree of empirical basis. It requires that decisions and actions be seen as part of a wider system.

The proposal has four interacting components:

```
┌─────────────────────────────────────────────────┐
│            OVERALL CO-ORDINATION                 │
├─────────────────────────────────────────────────┤
│              \     PLANNING     /                │
│               \               /                  │
│                \             /                   │
│   DATA          \           /   LONG             │
│   COLLECTION     \         /    RANGE            │
│                   \       /     DECISION-         │
│                    \     /      MAKING            │
│                     \   /       MECHANISM         │
└─────────────────────────────────────────────────┘
```

1. Overall Co-ordination

A single person (not the most senior officer) in the special education hierarchy should have a co-ordinating role. He would be responsible for the input and execution phases of the decision-making. It would not normally be the only task for this person, who would also be going on with his regular work.

This officer would not be making decisions but should be guaranteeing a rational decision-making process.

2. Data Gathering

A task of the co-ordinator would be to devise simple ways to obtain adequate data on which planning and major decision-making can be based.

One unsuitable way is to use student performance data - feedback turnaround time is too great; it is available at the wrong time for budgeting purposes; there is a lack of agreement on the validity

of measurement processes.

Data which would be needed is:

- projections of what funds will be available,
- subjective evaluation of administrative activity,
- subjective evaluation of instructional activity.

These last two items, being judgemental rather than just descriptive, would be useful for needs, assessments and long term planning.

The data should be available during budgeting and long-range decision-making processes.

3. Planning

The purpose of obtaining subjective feedback is to allow the making of a long-range plan of change for programs. The data so gathered is a type of needs assessment, a step which is a precursor to sound planning. Program officers would be required to document their long-range plans describing specific practices which should be initiated, changed or terminated. The general philosophy of program growth would also be spelled out.

4. Long-Range Decision-Making Mechanisms

The key feature of the entire structure is the actual making of a rationally-based decision - the taking of a definite stand for change, not just maintaining the status quo as a non-decision.

The final decisions could be made either:

- by the most senior officer in special education and the

person in charge of a program, or

- by a standing committee of all program officers who gather

frequently for in-process decision-making, at which time

tentative changes could be discussed from all viewpoints.

There is little that is original or epochal in Proger's decision-

making system but the fact that he has felt obliged to spell it out in

this way is an indication of the dysfunctional nature of much special

education decision-making.

D. AN OPERATIONAL SYSTEM

A philosophy, or system of principles, clearly enunciated and public,

ought to underline the operation of special education. Such a philosophy

would legitimize and make coherent the activities undertaken and make it

possible for them to be explained to observers and practitioners.

Gunsburg and Gunsburg offer an operational philosophy as a coherent

framework of definite principles and as a background for policy decisions

and planning of practical details:

> "It is the aim of....educational effort to raise the mentally
> handicapped person's level of functioning as far as possible
> in the personal, social and work spheres, and thereby give
> him an opportunity for leading a happier and more effective
> life in his community." (1973, p. 73)

They expand this statement and point out that it is an operational

philosophy because it is clearly practical and can be applied in all

areas and to all details. Many different types of community provisions

will be required, offering a variety of degrees of protection and guidance.

Somewhere on the continuum will be the background of home and community

living appropriate for each mentally disabled child. Considering his

disabilities and the available time and resources, his education and

training will have to be programmed to meet his most important needs

and it will have to be comprehensive in its application by extending

to areas which are not traditionally part of formal education.

These are three aspects of this operational philosophy:

1. Socialization

Education in social skills and work habits are essential to make a

retarded person more acceptable and to make him feel more at home in

his community.

2. Normalization

He will be greatly helped by experiencing normal patterns of living.

Wolfensberger defines normalization as:

> "the use of culturally valued means to establish and/or
> maintain, as much as possible, experiences, characteristics,
> personal behaviours and roles and social images that are
> culturally normative and valued."   (See footnote p. 35)

3. Personalization

This formal program of socialization and the informal learning through

normalization will be effective only if a pupil, at all places and during

all stages of his education, is encouraged to exercise a certain amount of

personal independence, commensurate to his abilities.

The three aspects of the Gunsburgs' operational philosophy –

socialization, normalization and personalization – require integrated

application, since each in isolation is somewhat ineffective and self-

limiting.

Each contributes substantially to satisfying needs of intellectually

disabled pupils but, to some extent, personalization must be regarded as

primus inter pares. Success in this area provides the driving force, energy and motivation which turn a well functioning retarded pupil into a human being with all that this term implies. A reasonable development of all three aspects will make it possible to achieve the final overall aim of a socialized, adjusted, intellectually disabled person.

Personalization also supplies the criteria by which to select the most appropriate course of action in other areas, such as normalization. It is necessary to choose from the wide range of normal behaviour and conditions those practices which best serve the aims of personalization. For example, it is normal for people to wear shoes without laces and it would be easy to teach pupils to put such shoes without laces on their feet; shoes with laces are normal, too, however, and if pupils are to become independent, they need to learn how to tie laces. Foolproof operations may be normal but, from the point of view of personalization, other normal operations are preferable.

The Gunsburgs' system of principles allows for the development/ description of an organizational scheme for education provisions. It is a model which gives an opportunity for considering the relationships among various provisions and clarifies their respective roles and contributions to the overall aim. This aim is to effect adequate socialization of the intellectually disabled person and to enable him to lead a relatively independent life in the open community.

The Gunsburg's organizational scheme is represented in their diagram (1973, p. 78) which follows. It plans for a social education and training program for intellectually disabled people through three phases: Nursery and Junior Phase, Middle Developmental Phase and Senior Developmental Phase.

The educational provisions for the three phases are indicated in the diagram by the shaded centre core. In some cases these will have to be followed into a fourth, adult phase, by certain social provisions such as sheltered workshops. The two prongs of the fork indicate the two possible ways into the community.

A social education and training program
for intellectually disabled people.
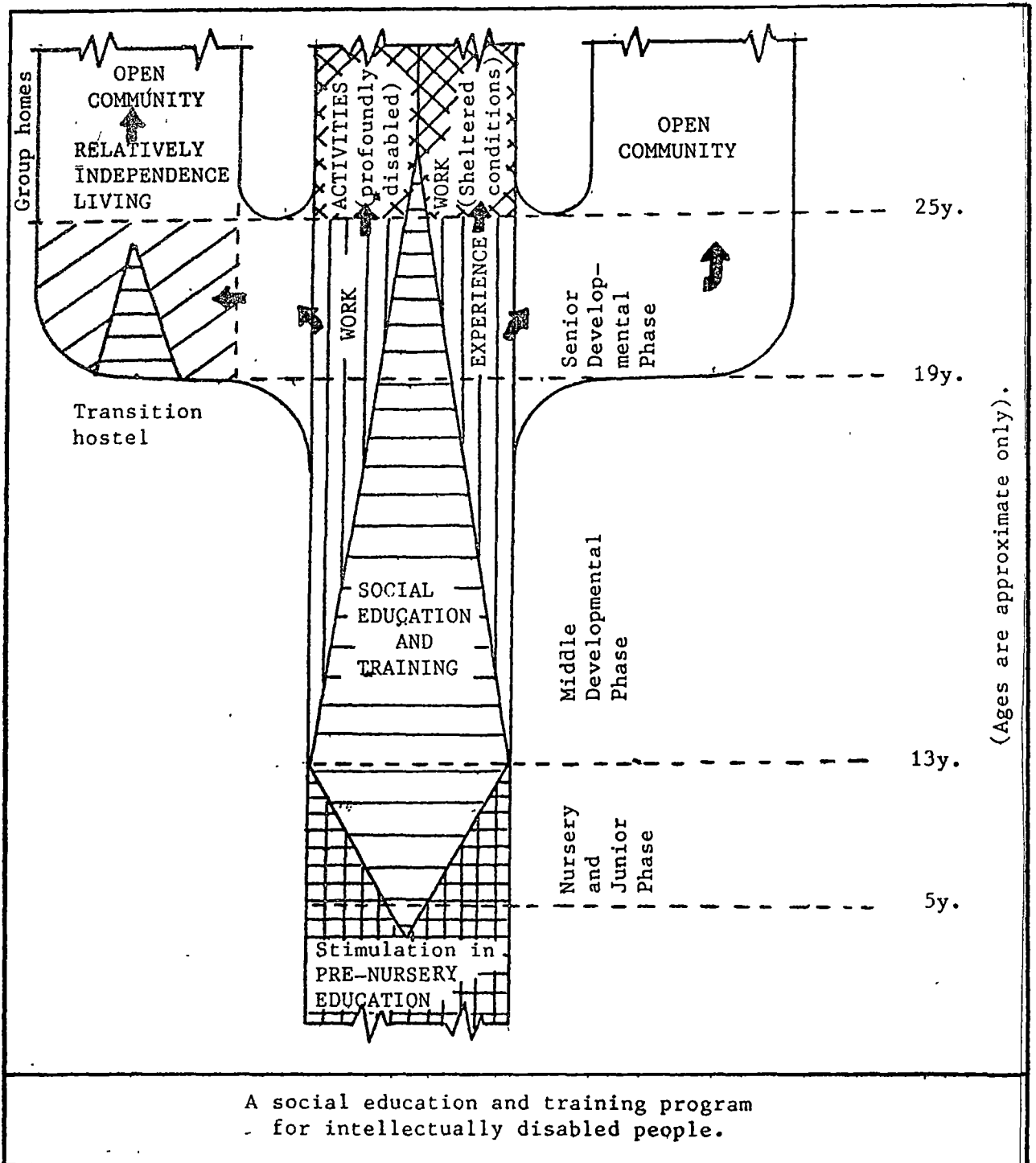
The writers go on to examine detailed, practical implications of the scheme.

With a sound, clear and public philosophy as a base, then, it is possible to determine policies and to devise organizational schemes. From these, details can be decided on, and these details will reflect the original philosophy.

That approach is the reverse of many approaches in the provision of special education. In Tasmania, detailed arrangements for funding, staffing, buildings, programs and the like have existed for decades. Currently, some policies and structures are being established. A number of philosophies no doubt underline the practices but, despite the Review of Special Education, no overall philosophy of special education in Tasmania has yet been made public. Perhaps the Gunsburgs' systems of principles could fill the vacuum.

E. A SYSTEM OF CURRICULUM DEVELOPMENT

One of the most useful applications of systems in special education can be the development of curricula for groups of disabled pupils. Such pupils vary considerably in knowledge and in needs and there can be no universal curriculum for them. A suitable curriculum has to be planned and evaluated in a context which includes a particular pupil (or small group of pupils), a particular school and a particular teacher.

Historically, it has been the lot of special educators to develop curricula to suit their own contexts and this is as it should be (Brennan,

1979, p. 10). Not all teachers, however, are equipped to carry out such a task but an understanding of systems and systems approaches would make the task less difficult.

> "Systems......(are) deliberately designed synthetic organisms, comprised of interrelated and interacting components which are employed to function in an integrated fashion to attain predetermined purposes."
> (Banathy, 1973, p. 144)

The curriculum development model to be discussed in this section of the paper is a synthesis with several major sequenced components and featuring a feedback mechanism. Each major component is comprised of a number of steps to be undertaken by a teacher in assuming the role of manager of learning. Management, in this case, refers to the activity of planning, organizing, motivating and controlling human and material resources and their interaction in order to achieve a predetermined goal.

The writer has been associated with the development of a mathematics curriculum designed for a group of intellectually disabled pupils in a Tasmanian special school. An objectives model of development was appropriate for at least two main reasons:

- in special education, more than in most areas of education, it is possible to identify intended learning outcomes (objectives), and

- a great proportion of knowledge to be acquired by pupils is in the form of skills and information.

Even Stenhouse, who does not approve of the model generally, says

> "The objectives model appears more suitable in curricular areas which emphasize information and skills." (1976, p. 97)

The following diagram is a representation of the system of development used for this mathematics curriculum.
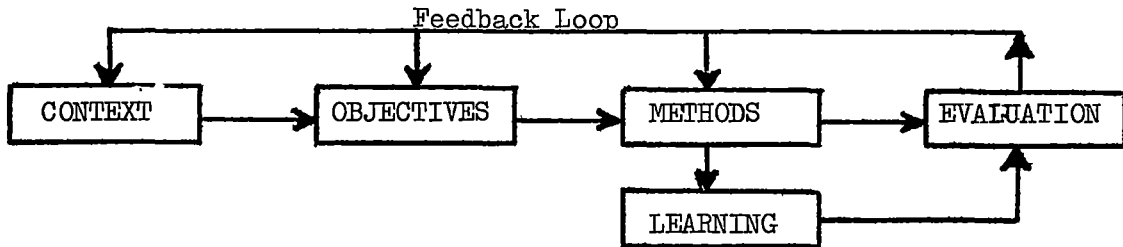
As with other diagrams in this paper, the arrows indicate the direction of flow of material, energy and information. The feedback loop is a complex one. It an evaluation exercise indicates that the methods are effective, the next move in scope and sequence of activities may be planned. If not, the manager must identify which components need to be changed - methods, objectives or some aspect of context.

A more detailed consideration of the components follows:

Context

Contextual factors to be considered in planning a mathematics curriculum in this class include......

- Education Department policies and constrictions (including staffing, buildings and funding).

- research findings and existing curricula.

- pupil abilities and needs.

- constrictions of disabling condition.

- abilities and interests of the teacher.

- factors relating to the school - assumptions

                                    - policies

                                    - operation

                                    - aims

It is easy to ignore the assumptions made by a school or to believe

that they are shared by everyone involved. There is a strong case, however,

for having them clearly spelled out for a particular situation. The

assumptions will change as other aspects of the context change. Some of

those which applied and were identified by the writer while developing the

mathematics curriculum were:

- that, because the students learn slowly and in a finite
  time period, curriculum content must largely be restricted
  to essential areas.

- that essential areas are those which are worthwhile in a
  utilitarian sense.

- that the acquisition of "survival skills" should take
  priority over "purely" pleasurable experiences.

- that skills are more important than understanding.

- that the cognitive domain should receive a higher priority
  than the affective, conative and psycho-motor domains.

- that there is likely to be little transfer of learning in
  the cognitive domain.

- that formal education is a process for equipping children
  for future life.

Objectives

Given a certain context, a competent, experienced special educator

can then set realistic objectives for pupils' learning. The objectives

of the mathematics curriculum reflected research findings about the

type of mathematics problems which were met by mildly retarded adults.

Almost 90% of these problems involved money so many of the curriculum

objectives needed to be stated in money terms.

Most of these problems were faced orally, so objectives concerned

with recording did not have to be emphasized.

Behavioural objectives for a group of pupils with a range of abilities

are difficult to state unless at least three levels of objectives are considered. Also, it is not acceptable for any objective to be stated with a high degree of specificity. Differences in fine motor control and temperament as well as intellectual functioning will affect the rate at which answers can be written. Objectives and the measurement procedures derived from them should, therefore, include a significant degree of subjectivity.

Methods (for achieving objectives)

The abilities and interests of the teacher will affect this element of the system more than any other element. Teaching techniques will be highly personalized but will have to bring about changes in pupil behaviour listed as objectives.

The teacher will make decisions about the mode of input, materials to be used, sequencing of tasks, pupil grouping, motivation and reinforcement procedures.

The systems (and sub-systems) approach taken in developing the mathematics curriculum means that mathematics cannot be considered in isolation from other school activities. Mathematics skills and understanding are learned or improved during work in other content areas. Woodwork, craft, gardening and cooking lessons can all be structured so that they become maths lessons as well. On the other hand, pupils can acquire knowledge and attitudes during mathematics lessons which have little connection with number. For instance, neat bookwork has little inherent mathematics value but can be valuable in the affective (self esteem) andpsycho-motor (especially fine motor control) domains.

<u>Evaluation</u> (of the effectiveness and efficiency of teaching methods
designed to achieve objectives)

There is a clear connection between objectives and measurement
procedures. If the objectives are of a reasonable degree of specificity
(e.g. "The student can calculate the value of a group of different
notes up to $100.00"), the measurement is clear - either he can do
it or he cannot!

Evaulation, however, is much more than that mechanical approach.
Evaluation starts with straightforward measurement devices and proceeds
to subjective analyses. Judgements are required by the evaluator so
that the feedback mechanism is put to the best use.

These judgements will determine where feedback should become input
into the system.

If, for example, a student is unable to perform the task using notes
up fo $100.00, it might mean that

      -    teaching methods have to be changed or repeated,

      -    the objective was unrealistic or,

      -    some aspect of the learning context should be changed.

The judgement will be based on the evaluator's experience, perceptions,
personality and wisdom.

> "A curriculum is an attempt to communicate the essential
> principle and features of an educational proposal in such
> a form that it is open to critical scrutiny and capable
> of effective translation into practice."
> (Stenhouse, 1976, p. 4)

The development of the curriculum discussed in this section has resulted in a form of education which meets the needs of a group of students - a form better than that which existed previously. A systems approach to curriculum development is an ideal way to ensure that educational needs of disabled children are met.

V SPECIFIC MANAGEMENT TECHNIQUES IN SPECIAL EDUCATION

Two management techniques which are system-oriented are discussed in this section. In each case, a description of the technique is followed by a consideration of the way it could be (or has been) used in Tasmanian special education.

A. PLANNING PROGRAMMING BUDGETING SYSTEM

"Continuous change is the dominant force in society and education.....
This situation requires fresh approaches to long-range decision
making.....Advance planning, as it specifically related to
educational budgeting, is critically needed."
(Katzenbach, 1968, p. 1)

In the 1960's, a major advance in the planning-budgeting process meant that a new and successful technique became available to educators - Planning Programming Budgeting System (PPBS).

PPBS may be defined in terms of its name:

- Planning refers to the process of the setting of long-term goals and objectives for an institution.

- Programming refers to the process of identifying and evaluating the programs which meet the objectives of the institution.

- Budgeting refers to the process of formulating a plan for the provision of resources to support the programs.

- System refers to the inter-relationships among planning, programming and budgeting.

Planning is a difficult and everchanging process requiring constant

attention yet only with planning can education achieve its goals. Even if it does not provide answers, planning can offer choices and certainly encourage thinking about improvements.

Traditionally, plans for improved education have been developed without due concern for the budget - and vice versa! The result has been education plans with poorly defined costs and well defined purposes, or budgets with well defined costs and poorly defined purposes. PPBS forces attention on the organization as a whole, relating educational plans to realistic costs. Programming provides the catalyst.

Individual programs, in each subject area or across subject boundaries, are planned in conjunction with budgeting procedures, for both short and long terms. The plan becomes a system which includes teachers, students, materials, time, space, methods and goals whose cost have been ascertained for the life of the plan.

Wisely claims that PPBS can make decision-making and policy-making a much more systematic and intelligent process than do other methods:

> "It identifies alternative ways of achieving a given end
> and provides the information necessary for making choices
> among the alternatives. If properly used, PPBS makes it
> possible to conduct the public's business faster, better,
> and at minimum cost."   (1969, p. 16)

To Hartley, the most compelling reason for using PPBS is that:

> "It provides an information display system that reveals
> the current strengths and weaknesses......PPBS, in effect,
> holds up a mirror so that a (school) district can observe
> in detail its good features (successful programs) and bad
> aspects (duplicated content in departmental 'fiefdoms')".
> (1972, p. 22)

In a brief section, it is difficult to do justice to a description of the way PPBS operates; in any case, such a description if probably not necessary. It is useful, however, to consider the positive and negative aspects of this type of system.

PPBS helps schools to:

- improve cost analysis and control;

- evaluate programs in terms of objectives, cost, benefits;

- identify and analyse alternative ways of achieving the same goal;

- establish priorities;

- allocate resources in view of total needs and resources;

- evaluate the performance of those responsible for attaining stated goals;

- co-ordinate planning;

- inform the public of purposes, costs and expected results of school programs.

But it also:

- takes time, money and skill to develop and operate;

- results in more detailed accounting and budget documents;

- may result in placement of too much emphasis on the costs of programs rather than on their benefits and costs;

- may meet with resistance from people (including staff members) who resent systematization of educational processes.[1]

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1.   These lists are based on those by Wilsey (1969, p. 17).

The most notable example of a special education institution using
PPBS is Gallaudet College in Washington, D.C. The function of this
120 years old college is to provide a liberal arts tertiary education
for deaf people. PPBS was adopted by the college in the 1960's to help
meet changing expectations both for the college and for deaf students.

These expectations are continuing to change and by comparison with
the early 1970's a greater number of deaf students are now being
accommodated at other colleges and universities. It will be a test of
Gallaudet and of the management technique as further adjustments are
made during the late 1980's.

Gallaudet College has a great deal of autonomy in that it receives
a huge financial grant direct from the U.S. Federal Government. There
is no Board of Governors, education authority or other agency to determine
the expenditure of that money. This fact has enabled the administrators
of Gallaudet College to use a technique which they perceive as the most
appropriate to the purposes of that particular college.

Although the College is not, in one sense, accountable to anybody
other than the Secretary for Health, Education and Welfare, PPBS makes
it publicly more accountable than many other institutions.

The size and independence of Gallaudet College makes PPBS a
feasible management technique. A small organization or one which is
required to operate within certain administrative and budgetry constraints
would find PPBS less feasible.

In the mid 1970's, a Tasmanian special school looked at the
possibility of adopting PPBS. It was possible (perhaps more so than
would be the case in a primary or high school) to identify goals and to

and to devise suitable programs. The difficulties arose in budgeting
areas. Education Department constrictions made program budgeting almost
impossible, even with double accounting procedures.

For example, the school devised a woodwork program to meet certin
objectives but the funding for the program came from several different
sources. The woodwork teacher's time, the tools, the timber, the
administration, the electricity and the cleaning were all paid for in
different ways. It was not possible for the school to identify the
cost of the woodwork program and relate it to the identifiable
benefits of the program. Nor was it possible to demonstrate that
similar benefits could be gained from other programs with different
costs.

It is probably not possible for an educational organization to
use the PPBS technique unless the organization has a considerable degree
of autonomy in budgeting as well as in educational processes. As
considerable time, money and skill are required to implement the technique,
it may be that organization size is another limiting factor.

In the opinion of this writer, it would be unrealistic for a single
special school to attempt to adopt PPBS unless significant changes were
made to the administration of the entire Education Department.

One special education institution which could realistically use the
technique, however, is the Schools Commission Special Education Committee.
The Committee is oriented to short term programs which it funds. It has
a relatively large budget and enough independence to make PPBS not only
feasible, but a very positive advantage.

The financial costs of the committee's programs are easily identified and the effectiveness of most programs could be evaluated easily. The public accountability of the committee would be greatly increased as would that of the administrators of the programs. The quality of special education in Tasmania would almost certainly improve with this accountability.

Program Budgeting (Modified PPBS)

In the 1960's, PPBS was adopted at federal level in the U.S.A. but was abandoned as a formal structure in the early 1970's. The likely causes of the seeming failure of PPBS were that it was attempted on too large a scale too quickly and that it was encumbered by an elaborate formal structure.

One problem with the use of PPBS in education is that educational benefits are difficult to measure. The number of children educated is a significant figure but it is not a measure of either the quantity or quality of education.

While efficiency can be interpreted as being benefits in relation to costs, an alternative approach is to regard benefits as a constant and to determine the least expensive option to achieve them. There is no reason why this method should not be used for education.
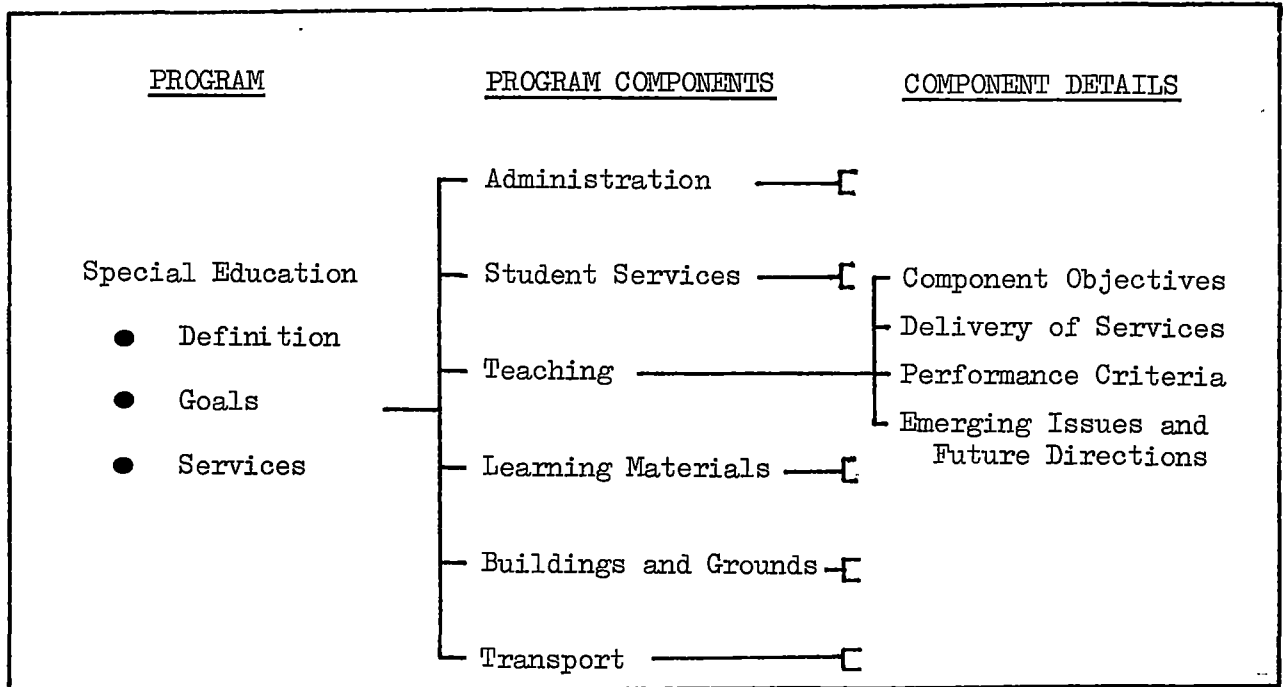
Consequent to the demise of PPBS on a federal level in the U.S.A., some local school districts adopted modified program budgeting systems.

In 1982, the Tasmanian Education Department also introduced program budgeting into its schools and general administration. The system has been embraced enthusiastically and knowledgably by a few individuals, with

scepticism by others and by opposition from another group.

Any major innovation which requires a new attitude as well as new knowledge will take time to introduce. The concept has been introduced in a systemic manner (considering the implications and dysfunctions mentioned in Chapter III).

One of the programs included in the program budgeting plans is "Special Education." This program has a definition, goals and a description of services. There are several program components (such as administration and teaching), and for each of these is listed objectives, service delivery details, performance criteria and emerging issues.

PROGRAM   PROGRAM COMPONENTS   COMPONENT DETAILS

                            ┌─ Administration   ──────[

Special Education   � ─ Student Services ───────[┌─ Component Objectives
    ● Definition   │   ├─ Delivery of Services
                            ┌─ Teaching   ──────────────── ├─ Performance Criteria
    ● Goals   │   └─ Emerging Issues and
    ● Services   � ─ Learning Materials ───[Future Directions

                            ┌─ Buildings and Grounds ─[

                            └─ Transport   ───────────[

Issue may be taken with details of the program and some aspects of it have been substantially altered by the implementation of Professor Hughes' recommendations (Hughes, 1983). This work, however, is a desirable first step (although it falls short of actually budgeting) and indicates the feasibility of a systems approach in the administration of special

education in Tasmania.

In the 1980's, education is

"faced with financial constraints and
with calls for greater accountability for both the inputs and outputs......,
further examination of the possibilities of program budgeting may well
be justified." (Campbell, 1980, p. 19)

B. PROGRAM EVALUATION AND REVIEW TECHNIQUE (PERT)

The second specific systems technique is PERT - a network which is

essentially a graphic representation of a plan. This plan displays an

orderly step-by-step series of actions which must be successfully

performed to reach the defined objectives.

PERT is a management technique which is best suited to non-repetitive

operations. Its contribution to repetitive tasks such as the manufacture

of bricks or the day-to-day operation of a school is slight and the

need for PERT is such tasks is slight.

For "once-through" processes, however, PERT is an effective tool in

reducing uncertainty, so that decision making and implementation can take

into account all sub-systems. It is a method of minimizing production

delays, interruptions and conflicts; of co-ordination and synchronizing

the various parts of the overall task; and of expediting the completion

of projects. It is a technique for scheduling and budgeting resources

so as to accomplish a predetermined task on schedule. It is a communication

facility in that it can report developments and thus keep managers and
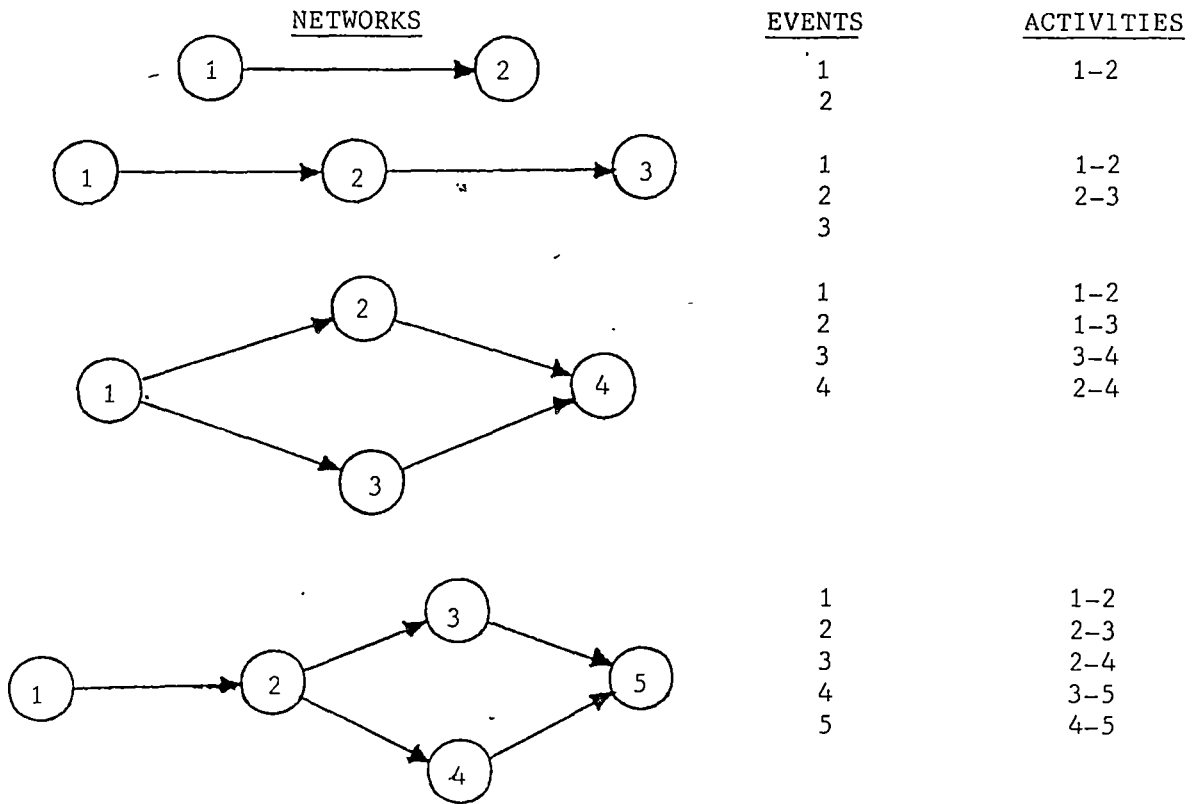other participants informed.

"Above all, PERT is an outstanding approach to achieving
completion of projects on time."
(Levin and Kirkpatrick, 1966, p. 3)

The technique is concerned with two concepts: events and activities.
An event is a specific accomplishment which occurs at a recognizable
instant. An activity is the work required to complete an event. In
PERT networks, events are generally represented by circles and
activities as arrows joining two circles. This figure illustrated two
events linked by one activity:

Event 1 would represent the instant "work started" and event 2
the instant "work finished." The arrow connecting the two events (1-2)
represents the work done and the time needed to plan and do that work.
Events take no time in themselves - they only mark the beginnings and
endings of activities. The activities, not the events, require time,
money and other resources.

Simple PERT networks are here shown described in PERT terminology:

NETWORKS	EVENTS	ACTIVITIES

The first network:

EVENTS: 1, 2
ACTIVITIES: 1-2

The second network:

EVENTS: 1, 2, 3
ACTIVITIES: 1-2, 2-3

The third network:

EVENTS: 1, 2, 3, 4
ACTIVITIES: 1-2, 1-3, 3-4, 2-4

The fourth network:

EVENTS: 1, 2, 3, 4, 5
ACTIVITIES: 1-2, 2-3, 2-4, 3-5, 4-5

The term network denotes that when several events and activities are combined and the resulting diagram is drawn, that diagram takes on the general appearance of a network.

Most activity in Tasmanian special education is repetitive and PERT would have little to offer. There are, however, a number of non-repetitive projects where PERT could make or could have made a great contribution: e.g.

- the construction of a new school building (St Giles Special School)

- the establishment and operation of the Review Committee on Special Education in Tasmania.

- the development of curriculum materials for slow learners

  in high schools.

- the planning for several early intervention programs.

One project in which PERT did assist was the planning for Mini Olympics '80 - a weekend of sporting competition and social interaction for 300 pupils from Tasmanian and Victorian special schools. The games, which were held at Snug in November, 1980, were the second such games but were not dependent on the inaugural games the previous year (in Launceston). Lessons were learned from the inaugural games but Mini Olympics '80 was essentially a non-repetitive project.[1]

In the end,. the games proceeded very smoothly with no unforeseen difficulties emerging. Throughout the planning stages, preparations were always ahead of schedule. This allowed for changes in plan to avoid last-minute hyperactivity and confusion. PERT ensured that the right work was done by the right people at the right time and that everybody involved was kept informed of developments.

Early in December, 1979, the Principal of the host special school announced that the games would be held at Snug in approximately one year's time. From that moment, planning for Mini Olympics '80 was under way.

Because the dates for the games would be largely dependent on the availability of suitable accommodation, the Principal (from now on called the General Co-ordinator) sought relevant details and dates were decided on and announced. During the next two months, the General Co-ordinator planned
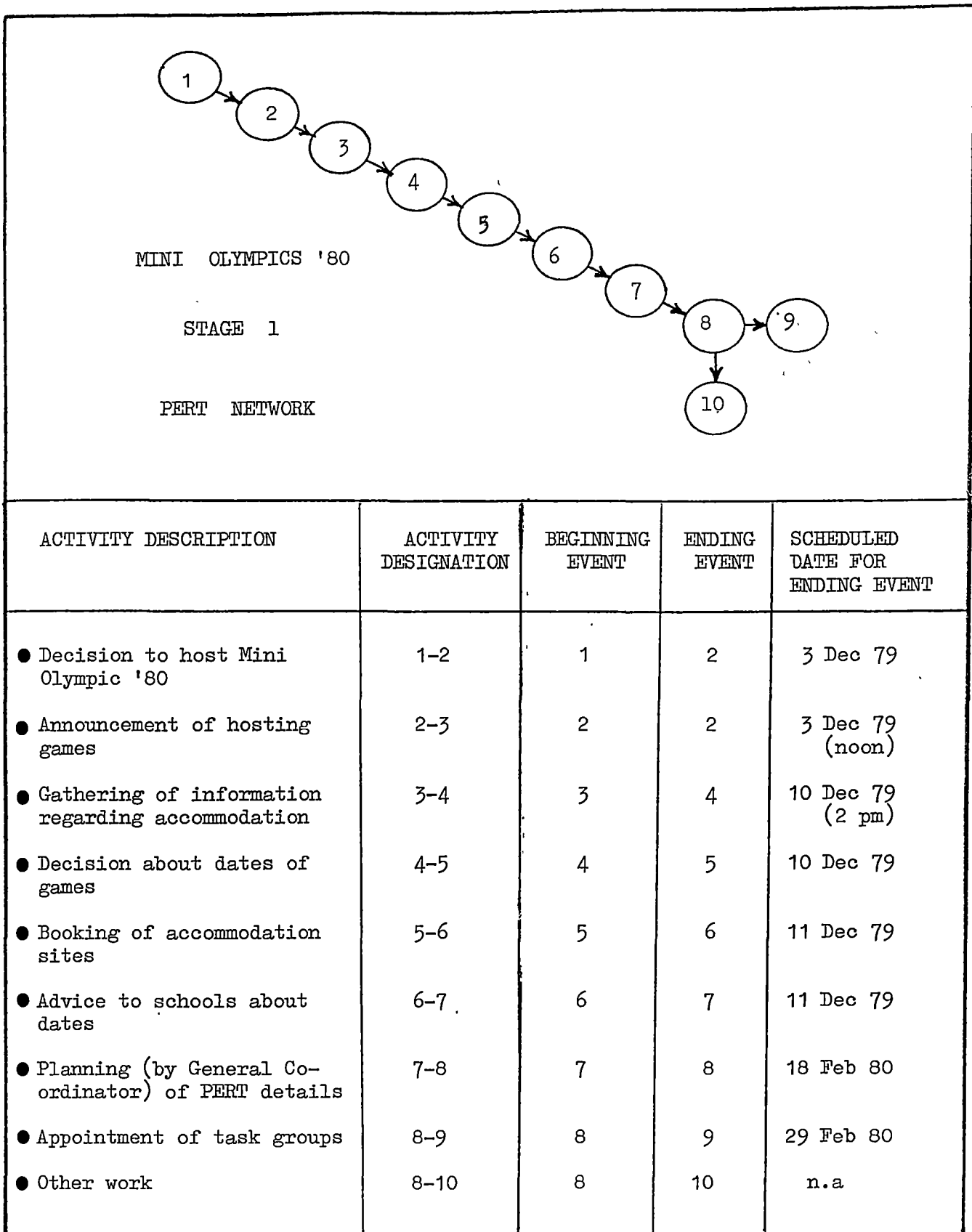
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1. The information (including diagram) presented about Mini Olympics '80 was made available to the writer by the organizers of the project.

the remaining planning approaches. One major decision was to appoint task groups (each with its own Co-ordinator) to organize details of various aspects of the games. Thus, there were task groups for

accommodation, meals, transport, finance, grounds development, program design, publicity, Opening Ceremony and for each sport.

Some groups (e.g. Golf Task Group) were small and had a relatively small task to perform. Others (e.g. Meals Task Group) were larger and had an immense task which was to take eight months to carry out.

The PERT network for the first two months of the project, is a simple linear one involving mainly the General Co-ordinator and the host school staff:

MINI OLYMPICS '80

STAGE 1

PERT NETWORK

ACTIVITY DESCRIPTION	ACTIVITY DESIGNATION	BEGINNING EVENT	ENDING EVENT	SCHEDULED DATE FOR ENDING EVENT
● Decision to host Mini Olympic '80	1-2	1	2	3 Dec 79
● Announcement of hosting games	2-3	2	2	3 Dec 79 (noon)
● Gathering of information regarding accommodation	3-4	3	4	10 Dec 79 (2 pm)
● Decision about dates of games	4-5	4	5	10 Dec 79
● Booking of accommodation sites	5-6	5	6	11 Dec 79
● Advice to schools about dates	6-7	6	7	11 Dec 79
● Planning (by General Co-ordinator) of PERT details	7-8	7	8	18 Feb 80
● Appointment of task groups	8-9	8	9	29 Feb 80
● Other work	8-10	8	10	n.a

Each task group had its own PERT network to ensure that work was carried out as needed. Frequent informal and occasional formal reporting and discussion sessions were held with the General Co-ordinator.

As well as the group networks, there was an overall network which assisted the General Co-ordinator keep control over the entire project – preparations, the games themselves and the follow up activities.

One of the group networks – that of the Accommodation Task Group – was as follows (the dates shown indicate the time by which events should have occurred):

SPECIAL SCHOOLS MINI OLYMPICS '80 – ACCOMMODATION P.E.R.T. NETWORK
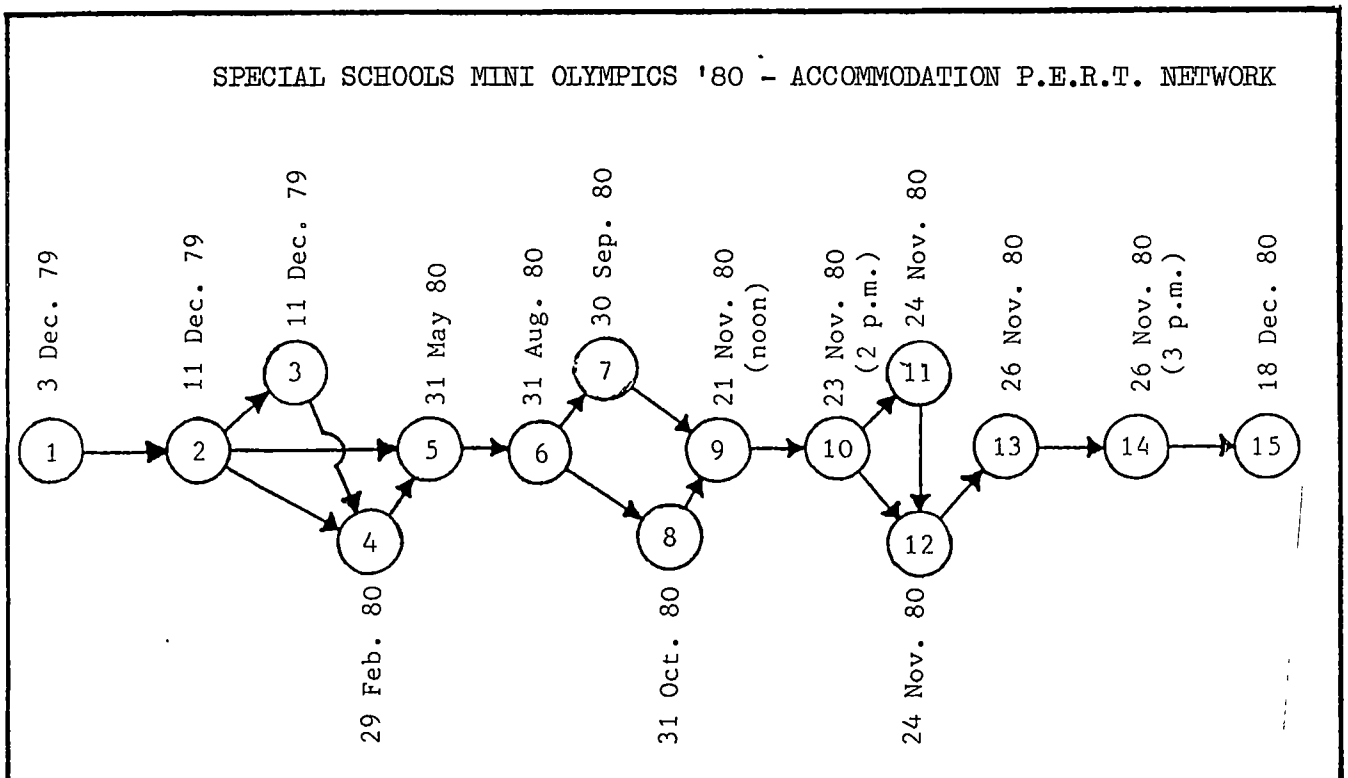
The following chart gives further information about the activities required of the group.

| ACCOMMODATION - P.E.R.T. NETWORK			
ACTIVITY DESCRIPTION	DESIGNATION	BEGINNING EVENT	ENDING EVENT
General Co-ordinator: Gathers information re availability of accommodation. Makes decision about dates and informs schools.	1-2	1	2
Books accommodation and pays deposit.	2-3	2	3
Appoints task group and group co-ordinator.	2-4	2	4
Receives replies from schools.	2-5	2	5
General Co-ordinator informs group re sites.	3-4	3	4
Group to gather detailed information about sites.	4-5	4	5
Group matches schools with suitable accommodation sites.	5-6	5	6
Group gains access to any necessary additional bedding	6-7	6	7
Schools given detailed information about accommodation.	6-8	6	8
Group collects extra bedding and deliver to site.	7-9	7	9
Schools arrive at sites	8-9	8	9
Group members act as hostesses to schools during time at sites.	9-10	9	10
A group member returns extra bedding.	10-11	10	11
Member reports to group co-ordinator	11-12	11	12
Group co-ordinator inspects all sites	10-12	10	12
Group co-ordinator prepares report with help of members.	12-13	12	13
Group co-ordinator reports to general co-ordinator.	13-14	13	14
General co-ordinator completes payments.	14-15	14	15

Had the Program Review and Evaluation Technique not been a feature of the administration of Mini Olympics '80 it is doubtful if an organization as small as the host school (or perhaps any organization) could have presented the games as the success they were.

For a non-repetitive project, especially one with a significant time factor, PERT can provide assistance in Tasmanian special education.
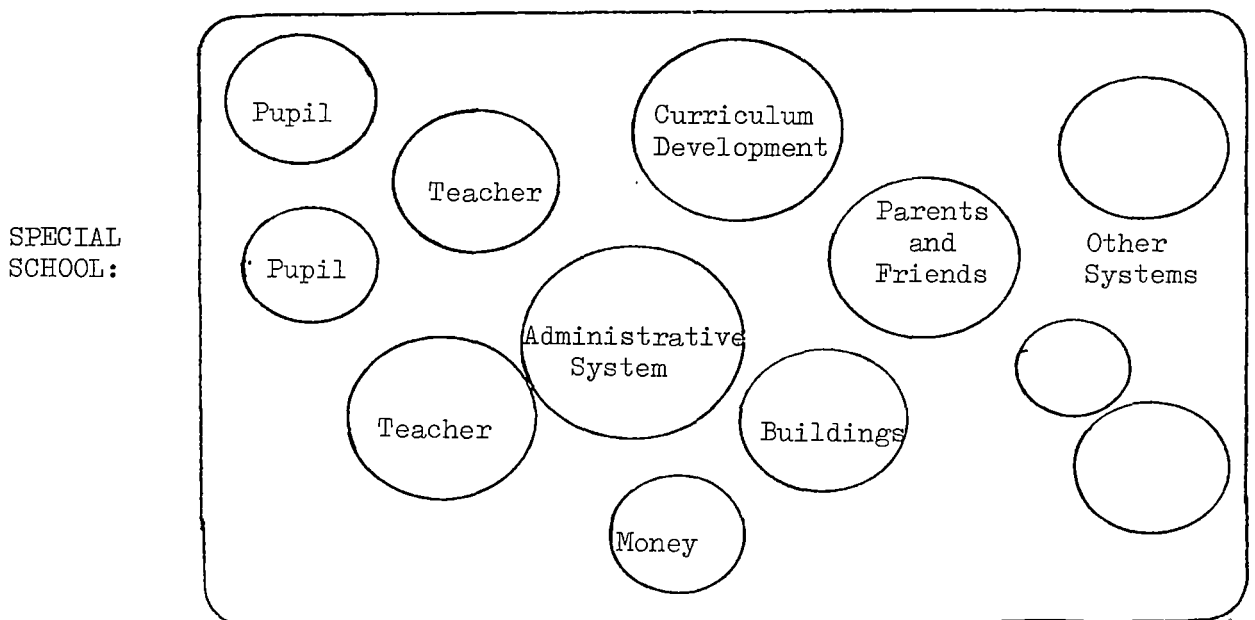
VI CONCLUSION

The concept of systems revolves around the synthesis of all elements of a process or conceptual framework. The elements, their relationships and their attributes all contribute to the nature of the system. The system itself is a sub-system (or element) with various attributes and with relationships with other sub-systems in a wider system.
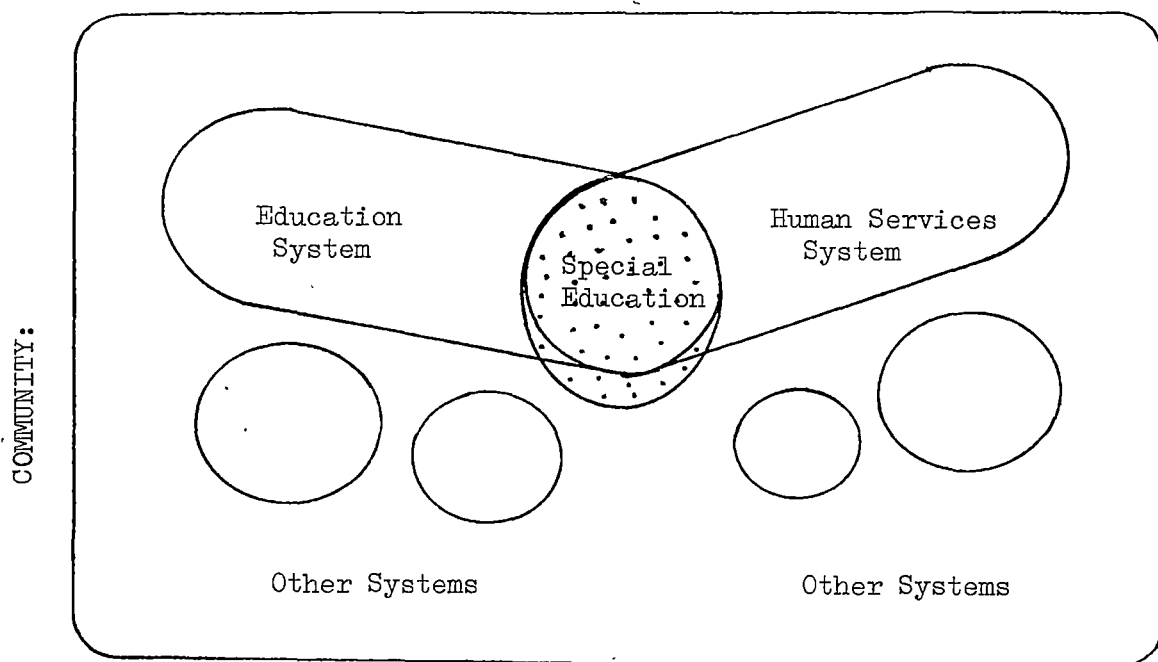
A child with a learning problem can be perceived as a functioning system with a number of sub-systems (each of them a system):

CHILD:

Skeletal System

Circulatory System

Intellectual System

Emotional System
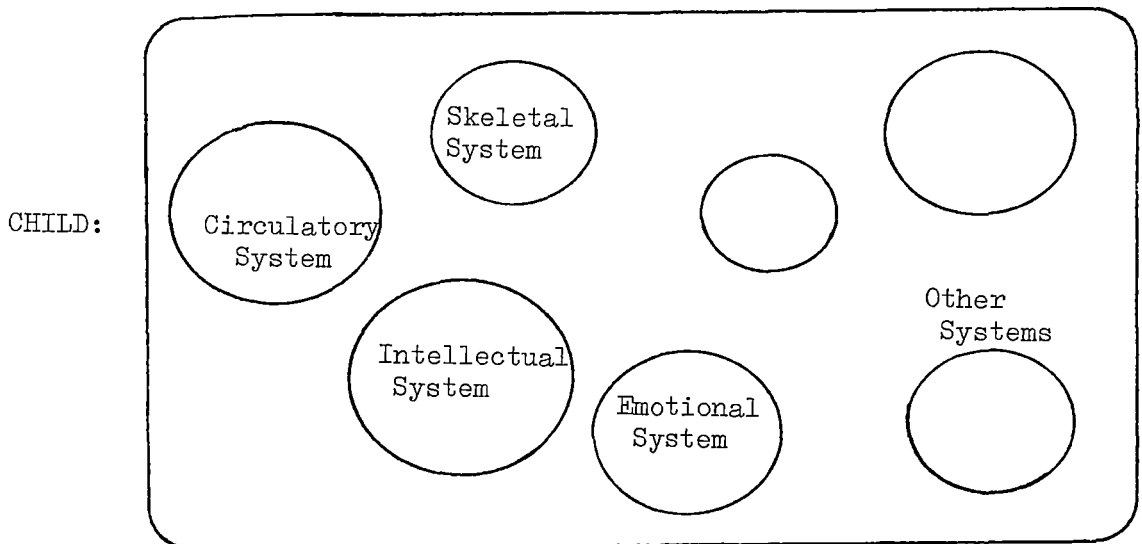
Other Systems

The child might be a sub-system of a special school, along with many other sub-systems:

SPECIAL SCHOOL:

Pupil

Teacher

Pupil

Curriculum Development

Parents and Friends

Other Systems

Administrative System

Teacher

Buildings

Money

And special education is a system functioning within several
wider systems:

Special education is part of the community's education system and is
also part of the human services system. Some components of a special
education system are not part of those two systems, e.g. publicity.
Relationships among components are multileveled and multifaceted. The
resulting complex structure will be affected by change in any of its
components so processes should be seen in a wide context. The implications
of decision making in one element of special education may be observed
throughout the whole special education system and beyond.

There is a great deal of excellent work being done in special
education in Tasmania but it is unco-ordinated. Too many decisions are
made and too many actions taken without sufficient regard for systemic
needs. These decisions and actions are reactive, short term and unrelated
to other decisions and actions within the system. Little information is
disseminated not only among schools, but within schools. The lack of

openness reduces commitment, efficiency and effectiveness. The dysfunctions discussed in Chapter III are all too apparent. This paper has been an attempt, firstly, to demonstrate the need for a systems approach to all levels of special education in Tasmania and, secondly, to show that such an ·approach is feasible. The need has been demonstrated with numerous examples (especially in Chapter III) of dysfunction caused by the lack of such an approach.

The feasibility is more difficult to demonstrate but examples indicate that good results have been achieved in this state where a systems approach has been taken:

e.g. - at the individual child level: the disruptive girl whose behaviour changed when a broad view of her needs was taken (pp 28)

- at a school level: the design of a mathematics curriculum which takes into consideration the context, objectives, methods, evaluation, learning and feedback involved (pp 59-65)

- at the state level: the introduction of a form of program budgeting (while the results of this cannot yet be judged, administrators are being required to plan and to anticipate in ways not required in the past) (pp 71-73)

- for a specific event: the organization of Mini Olympics '80 using PERT (pp 73-81)

Two significant developments in recent years have increased the possibility that a systems approach will characterize special education in Tasmania in the not-too-distant future.

The first of these developments has been the growth of professional skill among special educators, both teachers and administrators during the past decade. This has come about through changes in personnel and through opportunities for practitioners to acquire knowledge not formerly available to them. In particular, special school principals and other senior officers have taken advantage of courses in educational management.

The second development has taken place since 1982 as the structure of the Education Department has undergone far-reaching changes. Relevant changes include:

- a clearer organizational structure,

- a corporate planning approach to management,

- the adoption of program budgeting and the extension of school based budgeting,

- the reduction of the number of committees and the expectation that decision makers will be more obvious,

- an increase in accountability both in financial terms and in general decision making,

- and increase in special education administrators,

- a policy regarding Community Welfare and Education Departments' cooperation in certain matters.

While a new, more rational structure cannot guarantee an improved service, it does provide those special educators with increased management skills an opportunity to work more efficiently and more effectively. It will give them a greater chance to take a systems approach, an approach which, in the opinion of this writer, would improve the quality of education for disabled children in this state.

BIBLIOGRAPHY

Athey, I.J., "Launguage models and reading", Reading Research Quarterly, 1971 (7), pp. 17 - 109.

Banathy, B.H. in Meyen, E.L. et al. Strategies for Teaching Exceptional Children, Denver, Colorado, Love, 1973.

Beishon, J. and Peters, G. (eds.). Systems Behaviour, London, Harper and Row, 1976 (2nd edition).

von Bertalanffy, L. General System Theory, Middlesex, U.K. Penquin, 1973.

Brennan, W.K. Curriculum Needs of Slow Learners, London, Evans/Methuen, 1979.

Campbell, N.P. "Program Budgeting - An Aid to Financial Accountability", A paper prepared at Western Australian Institute of Technology, 1980.

Churchman, C. The Systems Approach, New York, Dell. 1968.

Connors, C.K., "Information processing in children with learning disabilities and brain damage". International Approaches to Learning Disabilities of Children and Youth, Tulsa, Oklahoma, Association for Children with Learning Disabilities, 1966.

Dunn, L.M., "Special education for the mildly retarded - Is much of it Justifiable?", Execeptional Children, 1968, 35, 5-24.

Education Department of Tasmania, A.Review of Special Education, Tasmania Government Printer, 1983.

Fitzgerald, J.M. and Fitzgerald, A.F. Fundamentals of Systems Analysis, New York, Wiley, 1973.

Frank, R.D. "Environmental influences on substrata of achievement leading to learning disabilities". Journal of Learning Disabilities, 1969 (2), pp. 155-159.

Gunsburg, H.C. and Gunsburg, A.L. Mental Handicap and Physical Environment, London, Bailliere Tindall, 1973.

Hartley, Harry, J. "PPBS: A Status Report with Operational Suggestions", Educational Technology, April, 1972, pp. 19-22.

Heinrich, R., "Application of systems concepts to instruction". American Annals of the Deaf. 1966, 111, pp. 603-610.

BIBLIOGRAPHY

Athey, I.J., "Launguage models and reading", Reading Research Quarterly, 1971 (7), pp. 17 - 109.

Banathy, B.H. in Meyen, E.L. et al. Strategies for Teaching Exceptional Children, Denver, Colorado, Love, 1973.

Beishon, J. and Peters, G. (eds.). Systems Behaviour, London, Harper and Row, 1976 (2nd edition).

von Bertalanffy, L. General System Theory, Middlesex, U.K. Penquin, 1973.

Brennan, W.K. Curriculum Needs of Slow Learners, London, Evans/Methuen, 1979.

Campbell, N.P. "Program Budgeting - An Aid to Financial Accountability", A paper prepared at Western Australian Institute of Technology, 1980.

Churchman, C₀ The Systems Approach, New York, Dell. 1968.

Connors, C.K., "Information processing in children with learning disabilities and brain damage". International Approaches to Learning Disabilities of Children and Youth, Tulsa, Oklahoma, Association for Children with Learning Disabilities, 1966.

Dunn, L.M., "Special education for the mildly retarded - Is much of it Justifiable?", Execeptional Children, 1968, 35, 5-24.

Education Department of Tasmania, A.Review of Special Education, Tasmania Government Printer, 1983.

Fitzgerald, J.M. and Fitzgerald, A.F. Fundamentals of Systems Analysis, New York, Wiley, 1973.

Frank, R.D. "Environmental influences on substrata of achievement leading to learning disabilities". Journal of Learning Disabilities, 1969 (2), pp. 155-159.

Gunsburg, H.C. and Gunsburg, A.L. Mental Handicap and Physical Environment, London, Bailliere Tindall, 1973.

Hartley, Harry, J. "PPBS: A Status Report with Operational Suggestions", Educational Technology, April, 1972, pp. 19-22.

Heinrich, R., "Application of systems concepts to instruction". American Annals of the Deaf. 1966, 111, pp. 603-610.

Hewitt, Heather, "An educational schema for children with dual disability of deafness and blindness". The Australian Journal of Mental Retardation, 5 (3), September, 1978. pp. 81-85.

Hughes, P., Review of Efficiency and Effectiveness of the Education Department, Hobart, University of Tasmania, 1982.

Kephart, N., The Slow Learner in the Classroom, Columbus, Ohio, Merrill, 1971.

Lerner, J.W. and James, K.W. "Systems and Systems Applications in Special Education". The Second Review of Special Education, Philadelphia, J.S.E. Press, 1974, pp. 273-306.

Levin, R.I. and Kirkpatrick, C.A. Planning and control with PERT/CPM, New York, McGraw-Hill, 1966.

Lilly, M.S., "A training based model for special education,", Execeptional Children, 1971, 37, 745-750.

Mark, H.J., "Psychodiagnostics in patients with suspected minimal brain dysfunction", Public Health Service Publication No.2015, U.S. Government Printing office, 1969.

Myklebust, H., The Psychology of Deafness, New York, Grune & Stratton, 1965.

Novick, D."What Program Budgeting is and is Not", Contemporary Accounting and Control, California, Dickenson, 1977.

Proger, Barton B. Linking Program Planning, Long-Range Decision-Making, and Accountability in Special Education, Atlanta, Georgia, 1977.

Schwartz, L., "A clinical teacher model for interrelated areas of special education", Execeptional Children,

Stenhouse, Lawrence. An Introduction to Curriculum Research and Development, London, Heinemann, 1976.

Thome and Willard, in Optner, S.L. (ed.). Systems Analysis, Middlesex U.K., Penguin, 1973.

Katzenbach, Edward, L. Planning Programming Budgeting Systems: PPBS and Education, Cambridge, Massachusetts, The New England School Development Council, 1968.

Wilsey, Carl. E. "Program Budgeting: an easy guide with the confusion removed", American School Board Journal May 1969, pp. 16-19.

Wolfensberger, W., _Normalization_,   Toronto, National Institute on
    Mental Retardation, 1979.