

**PRE- AND POST-TEST RESULTS OF THE COGNITIVE FUNCTIONING
LEVEL OF WORKERS WITH INTELLECTUAL IMPAIRMENT AFTER
THE IMPLEMENTATION OF A STRUCTURED ACTIVITY PROGRAMME
IN A PROTECTIVE WORKSHOP**

by

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**Assignment presented in partial fulfilment of the requirements for the degree of
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DECLARATION

I, the undersigned, hereby declare that the work contained in this assignment is my own, original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature:

Date:

ABSTRACT

Acknowledgement of the right to equal work opportunities for people with disabilities is widely supported in South Africa. Several policy documents and laws have been published since July 1993 and provide clear guidelines regarding equal opportunities for people with disabilities.

A state subsidy scheme for protective workshops was introduced for the first time on 1 April 1997 (*Operational Manual for Protective Workshops*, 2001: 1). The purpose of this subsidy scheme was to provide work opportunities for people who cannot enter the sheltered or open labour market due to the effect of their disabilities on their daily functioning. In March 2001, the Department of Social Development and Poverty Alleviation in the Western Cape introduced a draft document, *Operational Manual for Protective Workshops*. The aim of the manual focused on the development of the worker role and economic empowerment of people with disabilities who work in protective workshops.

Due to ignorance, fear and stereotyping, persons with intellectual impairment are being unfairly discriminated against in society and at the workplace. With reasonable accommodation, persons with intellectual impairment are able to demonstrate their work ability and contribute equally in the workplace. Persons with intellectual impairment contribute to the economy and society by means of their service in protective workshops.

The aim of the study was to investigate whether the structured activity programme implemented in a protective workshop in the Western Cape brought a change to the level of cognitive functioning of workers with intellectual impairment as assessed by the Allen Cognitive Level Screen (ACLS), with the purpose of making recommendations regarding the sustainability and extension of the structured activity programme.

Pre- and post-tests of the workers' cognitive functioning were done to determine whether the implemented structured activity programme had an effect on the cognitive functioning level of the workers. The ACLS was used as measurement instrument and a hypothesis was stated:

H0 – There is no change in the level of cognitive functioning of the workers after participation in a structured activity programme.

H1 – There is a change in the level of cognitive functioning of the workers after participation in a structured activity programme.

The Functional Information Processing Model (FIPM) was used as a frame of reference in the development of the structured activity programme for the occupational group. The structured activity programme was implemented and after one year and six months a post-test was done on the workers in the occupational group.

The null hypothesis was accepted as $p=0.28$. A 95% confidence interval was indicated. The post-test indicated that there was no significant change in the cognitive levels of the workers in the occupational group after implementation of a structured activity programme. This could have resulted from the study sample being too small. Although the change was not statistically significant, it indicated that learning did occur on an Allen Cognitive Level (ACL) 3. It is recommended that the study to be replicated at other protective workshops that may provide a bigger sample to confirm the amount of learning that takes place.

OPSOMMING

Erkenning van persone met gestremdhede se gelyke reg tot indiensneming word sterk in Suid-Afrika ondersteun. Verskeie beleidsdokumente en werkstukke is sedert Julie 1993 gepubliseer wat duidelike riglyne aangaande hierdie standpunt stel.

'n Staatssubsidieskema vir beskermdede werkwinkels is vanaf 1 April 1997 vir die eerste keer beskikbaar gestel (*Operational Manual for Protective Workshops*, 2001: 1). Die doel van hierdie skema is om werksgeleenthede te verskaf aan persone wat as gevolg van hul graad van gestremdheid nie die beskutte arbeids- of ope arbeidsmark kan betree nie. In Maart 2001 het die Departement van Sosiale Dienste, Wes-Kaap, 'n voorlopige dokument, *Operational Manual for Protective Workshops*, bekendgestel, wat fokus op die ontwikkeling van werksvaardighede en die ekonomiese bemagtiging van persone met gestremdhede in beskermdede werkwinkels.

Weens onkunde, vrees en stereotipering word daar onregverdig gediskrimineer teen persone met intellektuele gestremdheid in die samelewing, asook in die werksplek. Indien persone met intellektuele gestremdheid billik geakkommodeer word, sal hulle hul werkvermoëns demonstreer en sal hulle 'n gelyke bydrae kan lewer in die werksplek. Persone met intellektuele gestremdheid lewer 'n bydrae tot die ekonomie en die samelewing deur hul diens in beskermdede werkwinkels.

Die doel van die studie was om ondersoek in te stel of die gestruktureerde aktiwiteitsprogram, soos aangebied in 'n beskermdede werkwinkel in die Wes-Kaap, 'n verandering in die kognitiewe funksioneringsvlakke van werkers met intellektuele gestremdheid, soos bepaal deur die Allen Cognitive Level Screen (ACLS), teweeggebring het ten einde aanbevelings te maak oor die uitbreiding en volhoubaarheid van die program.

Voor- en na-toetse van die werkers se kognitiewe funksioneringsvlakke is gedoen om te bepaal of die gestruktureerde aktiwiteitsprogram enige verskil in hul kognitiewe funksionering gemaak het. Die Allen Cognitive Level Screen- (ACLS)-toets is as 'n meetinstrument gebruik en 'n hipotese is gestel:

H₀ – Daar is geen verandering in die werkers se kognitiewe funksioneringsvlak na deelname aan 'n gestruktureerde aktiwiteitsprogram nie.

H1 – Daar is 'n verandering in die werkers se kognitiewe funksioneringsvlak na deelname aan 'n gestruktureerde aktiwiteitsprogram.

Die Functional Information Processing Model (FIPM) is gebruik as 'n verwysingsraamwerk vir die ontwikkeling van die gestruktureerde aktiwiteitsprogram. Die gestruktureerde aktiwiteitsprogram is geïmplementeer en 'n na-toets is na 'n jaar en ses maande op die werkers in die gestruktureerde aktiwiteitsprogram gedoen.

Die nulhipotese is aanvaar aangesien $p=0.28$. 'n Sekerheidsinterval van 95% is aangetoon. Die na-toets het getoon dat daar geen statisties beduidende verskil was in die verandering van die kognitiewe vlakke van die werkers in die aktiwiteitsgroep na implementering van 'n gestruktureerde aktiwiteitsprogram nie. Die resultaat kan die gevolg wees van 'n te klein steekproef. Alhoewel die verandering in kognitiewe vlak nie statisties beduidend was nie, het daar tog 'n mate van leer op 'n Allen Cognitive Level (ACL) 3 by die werkers plaasgevind. Dit word voorgestel dat hierdie studie herhaal word by ander beskermde werksomgewings wat 'n groter steekproef kan lewer om die mate van leer wat plaasvind, te bevestig.

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CHAPTER 1

INTRODUCTION, MOTIVATION AND AIM OF THE STUDY

1.1 Introduction

Participation in productive work or work activities is vital to the survival of mankind. The American Occupational Therapy Association (AOTA) (1994), as stated in Jacobs (1985: 170), defines productive work or work activities as “purposeful activities for self-development, social contribution, and livelihood”. The philosophy of Occupational Therapy is based on the principle of active participation in purposeful activities to reduce or rehabilitate the effects of dysfunction. According to Jacobs (1985: 171) the purposeful participation in activities can lead to the adaptation of the worker role.

According to Jacobs and Pratt (1997: 2) occupational therapy practice enables clients to develop and maintain their ability to both participate and direct their involvement in meaningful activities. Reed and Sanderson (1999: 11) group those clients most likely to need occupational therapy services into the following: those with physical illness or injury, those with emotional disorders, those with congenital or developmental disability and the elderly. According to the American Disabilities Act (ADA) development or learning disorder and any mental disorder are defined as a mental disability, regardless of the cause or duration of the disorder (Binui & Kleiner, 2000: 62).

Acknowledgement of the right to equal work opportunities for people with disabilities is widely supported in South Africa. Several policy documents and laws have been published since July 1993 and give clear guidelines regarding equal opportunities for people with disabilities:

- White Paper on the Transformation of the Public Service (1995)
- Constitution of the Republic of South Africa (1996)
- White Paper on an Integrated National Disability Strategy (1997)
- Employment Equity Act (1998)
- Code of Good Practice – Disability in the workplace (1998)
- Skills Development Act (1998)

Key aspects of these policy documents focus on:

- The implementation of affirmative action measures to ensure equitable representation in all occupational categories and levels in the workforce
- The improvement of employment of people who were previously disadvantaged by unfair discrimination and to redress those disadvantages through training and education
- Ensuring that people with disabilities can exercise and enjoy their rights at work

A state subsidy scheme for protective workshops was introduced for the first time in the Republic of South Africa on 1 April 1997 (*Operational Manual for Protective Workshops*, 2001: 1) by the Department of Social Services at that time. The purpose of the subsidy scheme was to provide work opportunities for people who cannot enter the open labour market due to the effect of their disabilities on their daily functioning. By implementing this subsidy scheme, government has acknowledged the importance of participating in productive work or work activities for people with disabilities. In March 2001, the Department of Social Development and Poverty Alleviation in the Western Cape introduced a draft document, *Operational Manual for Protective Workshops*. The aim of the manual focuses on the development of the worker role and economic empowerment of people with disabilities who work in protective workshops.

1.2 Motivation for the study

According to the researcher, persons with intellectual impairment are unfairly discriminated against in society and at the workplace due to ignorance, fear and stereotyping on the part of the general population. Reasonable accommodation gives persons with intellectual impairment the opportunity to demonstrate their ability to work and contribute equally in the workplace. Persons with intellectual impairment who cannot be placed in the open labour market contribute to the economy by working in protective workshops.

Forty-one protective workshops in the Western Cape Province accommodated a total of 2 152 disabled workers in 2001. Twelve (29%) of these workshops were for people with intellectual impairment. This represented a population of 38% of the 2 152 workers.

Before the introduction of the policy documents and laws that focus on the empowerment of people with disabilities, workers were mostly placed in the protective workshop without matching task requirements to the workers' work abilities. Not all of the protective workshops in the Western Cape have the service of an occupational therapist who can develop and implement programmes that focus on the development and maintenance of the worker role and who can assist with optimal matching between the worker and the work activity. Workers were placed in protective workshops where no further development of the worker role took place even though they had the ability to be empowered to be placed into a work situation in the open labour market. Protective workshops also experience conditions of conflict, with the stronger workers who could be placed in the open labour market, being made responsible for maintaining productivity levels in the workshop.

Matching the abilities of workers with the requirements of work activities plays an important role in the motivation, interest and work satisfaction of a worker. If there is no fit between the worker and the activity it can lead to absenteeism, high workforce turnover, stress and a lower production rate (Grandjean, 1988). This leads to a decrease in qualitative and quantitative production levels, which has a significant impact on protective workshops as their income is reduced and they are faced with the threat of having to close down.

The fit between the worker and the work activity is therefore very important for protective workshops that accommodate persons with intellectual impairment to get the right fit between the worker and the work activity so that they are able to maintain their production levels and not be faced with a reduction in income and thus the possible closure of the facility due to not being sustainable.

The *Operational Manual for Protective Workshops* (Department of Social Services: March 2001) proposes a process called the Economic Empowerment Framework, aimed at the empowerment of workers in protective workshops. This document proposes two routes of economic empowerment, namely: a business route or employment. Employment can either be in protective workshops or in the open labour market. Employment in the protective workshop has three sub routes namely: activity group, training group and work programme in the protective workshop. Refer to Figure 1.1 for a diagrammatic representation of the researcher's interpretation of the framework.

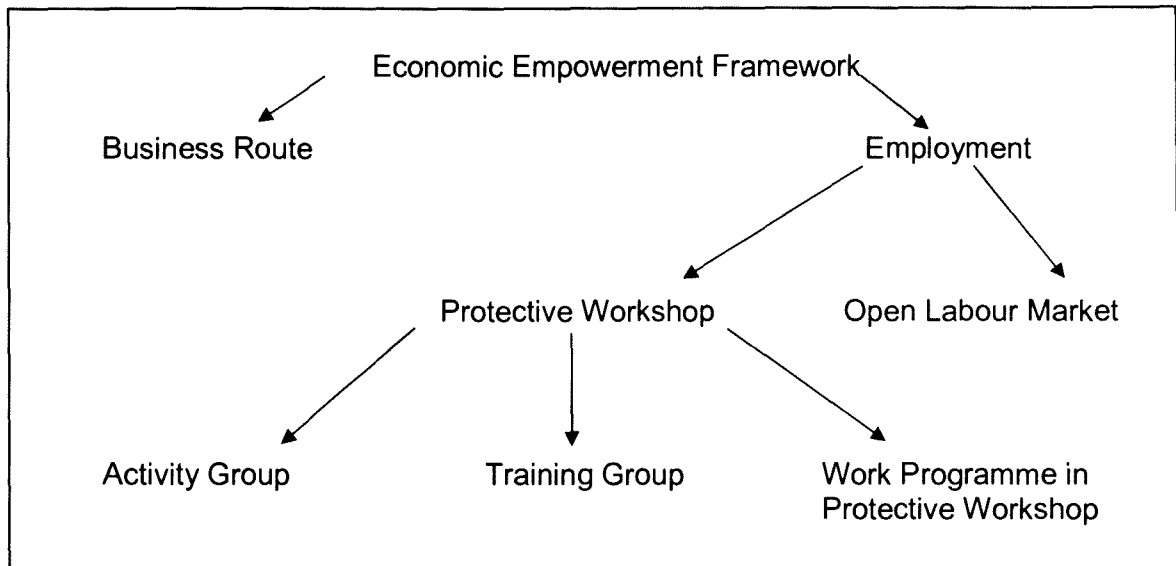


Figure 1.1: Adapted economic empowerment framework

The process of placement within the above-mentioned sub routes for the protective workshops involves:

- Assessment
- Planning of work preparation programme
- Training
- Evaluation

The above-mentioned process leads to placement of the worker in an appropriate sub route.

Specific programmes within each of the sub routes focus on the rehabilitation and maintenance of the worker's work abilities through activity analysis, adaptation and grading of work activities according to the worker's level of functioning.

Minimum standards are set in the *Operational Manual for Protective Workshops* for the training group and the work programme within the protective workshop. The minimum standards for the activity group are still being developed.

Workers who are placed in activity groups are unable to meet the production requirements of the protective workshop. Production requirements of a protective workshop are 50% of the open labour market norm (Uys, 1991: 202). Not being productive, persons in an activity group are labelled as “the group that needs to be kept busy”. Persons with intellectual impairment who are placed in an activity group are therefore stigmatised as having no potential for further development.

A protective workshop for workers with intellectual impairment in the southern suburbs of Cape Town requested the Department of Occupational Therapy at Stellenbosch University to assist with the assessment of its workers. This would enable them to do appropriate placements of the workers within the three sub routes as identified by the *Operational Manual for Protective Workshops*. The need for an activity group programme was identified by the manager of the protective workshop after all the workers had been assessed by means of the Allen Cognitive Level Screening (ACLS) test and placed within the sub routes. The protective workshop named their activity group the “occupational group”. The researcher will therefore use the term “occupational group” throughout the text.

The researcher was faced with the challenge to develop a programme that would focus on the maintenance of the worker role of the workers in the occupational group as well as develop the potential of the workers in the occupational group to progress to another group programme within the protective workshop should they show the potential. Developing such a programme was seen as a means towards counteracting some of the stigmatisation.

Kielhofner (1992: 117) has stated that, according to Allen, learning does not occur within a wide range of functioning levels. He suggested that there is a serious need to demonstrate through research whether permanent deficits exist in the learning capacity of persons with cognitive impairment. According to Kielhofner (1992: 116), only one study that was done indicated that patients learn to master a new skill and that learning differed in the groups with different cognitive levels. No further information on the study referred to by Kielhofner (1992: 116) was available to the researcher. He furthermore argued that a single study could not rule out Allen’s hypothesis that learning does not occur. Further research is thus needed to indicate in which occupational performance areas learning can take place.

The following questions emerged as a result:

- What are the ACL levels of the workers within the protective workshop?
- Can the ACL level be used to group the workers?
- What is needed to develop a structured activity programme in terms of type of activities, time length of activities, type of environment conducive to participation and performance, and human resources needed?
- Is there a change in the cognitive functioning level of workers with intellectual impairment in an occupational group within a protective workshop after the implementation of a structured activity programme?

1.3 Defining the research question

To assess the value of the implemented structured activity group programme in the occupational group of the protective workshop, there needs to be a re-assessment of the cognitive functioning levels of the workers. This is necessary to determine whether such a programme affects the cognitive functioning levels of the workers and to provide an opportunity to make recommendations regarding the structured activity programme.

A pre- and a post-test of the workers' cognitive functioning were done using the ACLS to determine whether the implemented structured activity programme had an effect on the cognitive functioning level of the workers. The following hypotheses were generated:

H0 – There is no change in the level of cognitive functioning of the workers in the occupational group after participation in a structured activity programme.

H1 – There is a change in the level of cognitive functioning of the workers in the occupational group after participation in a structured activity programme.

1.4 Aim of the study

The aim of the study was to investigate whether the structured activity programme that was implemented in a protective workshop in the Western Cape brought a change to the level of cognitive functioning of workers with intellectual impairment as assessed by the ACLS.

1.4.1 Goals

- Assessment of the level of cognitive functioning of all workers within the protective workshop
- Grouping of workers of the protective workshop according to their Allen Cognitive Levels (ACL)
- Selection of the workers who scored an ACL 3 for placement in the occupational group by the workshop manager. This was done as the description of persons in an activity group who function on an ACL 3 corresponds with the description of workers in an occupational group, as stated in the *Operational Manual for Protective Workshops* (Department of Social Services: March 2001).
- Placement of workers who scored an ACL 3 on the ACLS in the occupational group
- Development of a structured activity programme for the occupational group based on the ACL 3 of the workers
- Implementation of the above-mentioned programme
- Re-assessment of the level of cognitive functioning of workers within the occupational group after one year and six months
- Identify whether there was a statistically significant change in the ACL of the workers in the occupational group
- Identify whether the use of medication had any effect on the ACL of the workers in the occupational group
- Identify whether gender had any effect on the ACL of the workers in the occupational group
- Identify whether the age of the workers had any effect on the ACL of the workers in the occupational group
- Make recommendations regarding the structured activity programme with the purpose of sustaining and extending the structured activity programme.

1.5 Defining the parameters of the study

The study was limited to one protective workshop for people with intellectual impairment due to time constraints, limited human resources and an assignment does not require a large study sample. This workshop is located in the southern suburbs of Cape Town. Because of this limitation, the results cannot be generalised to the general population of workers with intellectual impairment working in protective workshops. Limited literary sources were available to support the research.

1.6 Definitions

1.6.1 Allen Cognitive Level (ACL)

“Ordinal hierarchical scale, ranging from 0,8 to 6,0, used to describe the status of cognitive ability” (Grant, 2003: 262).

1.6.2 Allen Cognitive Level Screen (ACLS)

“Leather lacing activity that is designed to determine the cognitive level of clients functioning between level 3,0 and 6,0. Clients are assessed on how they perform three leather stitches of increasing complexity” (Grant, 2003: 262).

1.6.3 Activity analysis

A detailed analysis of the specific steps and actions required to complete an activity.

1.6.4 Automatic actions

“... are those that a person does while conscious and responding to mental internal stimuli” (Reed & Sanderson, 1999: 256).

1.6.5 Cognition

“Responding to sensory cues by forming purposes and processing information to guide motor activity” (Kielhofner, 1992: 109).

1.6.6 Cognitive disability

“Impairment in task behaviour relative to cognitive skill; measured via Allen cognitive levels” (Grant, 2003: 262).

1.6.7 Cognitive functioning

“Task behaviour relative to cognitive skill measured via Allen cognitive levels” (Grant, 2003: 262).

1.6.8 Cognitive performance modes

“Describes the progression of cognitive ability within each cognitive level” (Grant, 2003: 262).

1.6.9 Exploratory actions

“... are those a person does to solve problems by trial and error” (Reed & Sanderson, 1999: 256).

1.6.10 Goal-directed actions

“... are those a person does to engage in purposeful activity to achieve a short-term goal” (Reed & Sanderson, 1999: 256).

1.6.11 Large Allen Cognitive Level Screen (LACLS)

“Leather lacing activity that is larger than the ACLS and enables clients with low-vision to engage in the screening” (Grant, 2003: 262).

1.6.12 Manual actions

“... are those a person does with the hands to manipulate objects, but the manipulations may be repetitive or pointless actions” (Reed & Sanderson, 1999: 256).

1.6.13 Mental retardation/intellectual impairment

A significantly sub-average general intellectual functioning accompanied by significant limitations in adaptive functioning with an onset before the age of 18. (Diagnostic and Statistical Manual of Mental Disorders [DSM-IV]) as defined in Kaplan & Sadock [1998: 1137]).

1.6.14 Occupational group/activity group

“A safe, protective environment, providing opportunities for learning and developing basic self-help, life and work skills through a programme of stimulating activities and simple basic tasks, for disabled persons who derive no benefit from a productive work environment due to the extent of their disability but who are entitled to the dignity of meaningful occupation” (Department of Social Services, March 2001: 84).

1.6.15 Planned actions

“... are those a person does when he or she can anticipate the effects of future actions and can think abstractly” (Reed & Sanderson, 1999: 256).

1.6.16 Prevocational programming

“Refers to occupational therapy evaluation/treatment that is work-oriented and provides the individual who has an impediment to work performance with an opportunity to engage in simulated work experience on a trial basis” (Jacobs, 1985: 11).

1.6.17 Postural actions

“... are those that a person initiates as gross body movement and which may be unusual postures” (Reed & Sanderson, 1999: 256).

1.6.18 Protective workshop

“Describes an economic empowerment centre for persons with disabilities where one or more economic empowerment vehicles are implemented, giving persons with disabilities a range of development opportunities to maximise their potential to secure an income” (Department of Social Services, March 2001: 85).

1.6.19 Supported employment

“Paid work in an integrated work setting for individuals who, because of their disability, need continuing support services to perform that work” (Spencer, 1989: 190).

1.6.20 Underlying mental structures

“The mental components used to organise thinking and learning processes” (Grant, 2003: 262).

1.7 Outline of study

The vocational rehabilitation process with the focus on how the worker role of people with intellectual impairment is affected will be discussed in Chapter 2.

The methodology that was followed to execute the study will be described in Chapter 3. A quantitative study structure was used as the researcher measured the pre- and post-test results on the ACL of the workers in the occupational group. The researcher will describe the study population, the measurement instrument, the various biases and the ethics involved in the study.

The results and the analysis of results will be discussed according to the research goals in Chapter 4.

The conclusion and recommendations regarding the implemented structured activity programme will be discussed in Chapter 5. The recommendations will be based on the results obtained from the study.

CHAPTER 2

INTELLECTUAL IMPAIRMENT, VOCATIONAL REHABILITATION AND COGNITIVE DISABILITIES MODEL

2.1 Introduction

Being engaged in work-related activities is vital to the survival of mankind. According to the researcher, work activities provide a platform for social standing; it is a source of self-identity and self-respect and adds to one's contribution in the community. Work is an occupational performance area that relates to employment, volunteerism and retirement planning. Engagement in work-related activities can be used as both a medium and a goal of occupational therapy. According to Siporin (1999: 23), as quoted by Fenton and Gagnon (2003: 342), "work can offer a sense of mastery over the environment, as well as a sense of accomplishment and competence leading to an improved quality of life". People with intellectual impairment do not always have the opportunity to experience this sense of mastery.

In this chapter the relationship between intellectual impairment and its effect on the worker role, as well as the cognitive disabilities model as a frame of reference in the development of a structured activity programme for people with intellectual impairment, will be discussed.

2.2 Intellectual impairment

Different terminology is used in the literature reviewed to describe people with an intellectual impairment. The terms used in the literature refer to mental retardation, intellectual disability or intellectual impairment. Intellectual impairment is the more accepted terminology within the South African context, according to the professionals working in the field of intellectual impairment. The researcher will therefore use the term 'intellectual impairment' throughout the text.

According to York, in Hansen and Atchinson (2000: 42), intellectual impairment is a functional condition, rather than a medical one, that can occur with or without other neurological or developmental disabilities.

Intellectual impairment can be caused by damage to or underdevelopment of the brain or some of its parts and functions (Grover, 2000: 1). The causes of intellectual impairment can be classified as pre-natal, peri-natal or post-natal. Refer to Table 2.1 for the causes of intellectual impairment.

Table 2.1 Causes of intellectual impairment

PRE-NATAL CONDITIONS	PERI-NATAL CONDITIONS	POST-NATAL CONDITIONS
Conception, e.g. chromosomal abnormalities	Conditions occurring during or around the birth process.	Head injuries
During Pregnancy: <ul style="list-style-type: none"> ▪ Certain infectious diseases ▪ Drugs taken by the pregnant mother ▪ Poor nutrition ▪ Rh. Factor ▪ Failed abortion 		Diseases that lead to infection of the central nervous system.
		Poison swallowed by the child.
		Malnutrition during early months after birth.
		Stimuli deprivation

Source: Grover, 2000: 2

According to the DSM-IV (Kaplan & Sadock, 1998: 1139), the person needs to meet the following criteria before being classified as a person with intellectual impairment:

- Onset before 18 years
- An intelligence quotient (IQ) of approximately 70 or below as assessed by a standard intelligence test
- Impaired adaptive functioning in at least two of the following areas: communication, self-care, home living, social/interpersonal skills and use of community resources, self-direction, functional academic skills, work, leisure, health and safety.

The degree of intellectual impairment is classified according to four categories of intellectual impairment. Refer to Table 2.2 for the categories of intellectual impairment.

Table 2.2: Categories of intellectual impairment

Intellectual impairment	IQ range	Mental age (years)
Mild	50-69	9 to under 12
Moderate	35-49	6 to under 9
Severe	20-34	3 to under 6
Profound	Below 20	Less than 3

Source: Kaplan & Sadock, 1998: 1139.

Kaplan and Sadock (1998: 1139) have stated that the category of borderline intellectual impairment was eliminated in 1973. This is due to the fact that borderline intellectual impairment refers to an IQ of 70-84 and may be the focus of psychiatric attention. According to Sturney (2002: 489), persons with borderline and mild intellectual impairment are also drawn between the classification and services of learning disabilities. Sturney (2002: 489) has stated that “the dual diagnosis, the occurrence of mental health problems and intellectual disability, not only faces problems over the definition of learning disabilities, but also over the definition of mental health”. According to Sturney (2002: 490) the relationship between challenging behaviour (self-injury, aggression, non-compliance, tantrums) and intellectual impairment is the biggest challenge facing therapists. A study done by Aman (Sturney, 2002: 490) indicated that one-third of adults living in group homes took psychotropic medication, primarily for behaviour problems rather than psychiatric symptoms. It is also for the above-mentioned reasons that persons with intellectual impairment are also classified under the umbrella of persons with psychosocial dysfunction.

According to the International Statistical Classification of Diseases and Related Health Problems (ICD-10) (Kaplan & Sadock, 1998: 1137), persons who are classified with mild intellectual impairment are able to perform basic life skills although their skills develop at a slower rate. Persons who are classified as moderately intellectually impaired will be able to achieve their full potential when placed in a structured environment and under supervision, as they are capable of engaging in simple work and social activities. Persons who are classified as severely and profoundly intellectually impaired have limited cognitive abilities and are incapable of providing for their basic needs.

Grover (2000: 12) stated that cognitive development refers to the gradually increasing and changing ways in which a person learns about the nature and qualities of things in the small but constantly changing environment. At 20 months, the sensory-motor mode of cognitive development is present. The child uses his senses and motor skills in the attempt to solve a problem. During normal development, the child progresses rapidly from the sensory-motor mode to the perceptual symbolic mode (36 months). In the latter mode, the child can now start to attach meaning to sensory information. During pre-school years, the child is able to form mental pictures and understands symbols. The normal child enters the concrete operational mode at the age of 6-7 years. In this mode the child uses mental operations or rules to check what is presented to the senses. Formal operations introduce the final stage or mode of cognitive development at the age of about 12 years. According to Grover (2000: 14) formal operations comprise the ability to solve problems in the mind without the use of concrete aids and the ability to think in abstract terms. Refer to Table 2.3 for the categories of intellectual impairment and probable rates of cognitive development.

Table 2.3: Categories of intellectual impairment and probable rates of cognitive development

CATEGORY	IQ	PROBABLE RATE OF COGNITIVE DEVELOPMENT DURING EACH 12-MONTH PERIOD	COGNITIVE LEVEL LIKELY TO BE REACHED AT MATURITY	
			MENTAL AGE	COGNITIVE MODE
Mild	50-60	About 6-7 months	7½ to approximately 9 years	Early concrete operational mode
Moderate	35-49	About 4-5 months	5 to just over 7 years	Advanced perceptual symbolic mode to threshold of concrete operations
Severe	20-34	About 2½-4 months	3 to just under 5 years	Perceptual-symbolic mode
Profound	Less than 19	2½ months or less	Just under 3 years or less	Sensory-motor mode or lower

Source: Grover, 2000: 14

Intelligence testing attempts to ascertain at which cognitive developmental level the individual is currently functioning. Grover (2000: 14) explains that when using the intelligence test, the mental age (MA) of the person is compared with the actual age or chronological age (CA) at that particular time. Comparing the MA and the CA gives the IQ. If the MA is the same as the CA, it refers to a normal cognitive development or an IQ

of 100 (average intelligence). In the case of intellectual impairment, the MA is always lower than the CA. A person could thus be 16 years old in terms of CA but only 6 years old in terms of MA. This means that the cognitive development rate of a person with intellectual impairment is slower than the normal cognitive development rate. It can thus be seen that the IQ only gives an indication of the rate of cognitive development that has taken place up to time of testing.

It is important to note that there are certain factors, e.g. medical conditions or environmental factors that can influence cognitive development at each stage of life, as indicated in Table 2.1.

There are currently two systems of classification of intellectual impairment. The American Psychiatric Association (APA) uses the system of classifying the IQ scores and the American Association on Mental Retardation (AAMR) uses a system based on adaptive skills (such as communication and self-care) and supported needs to function. According to York (in Hansen & Atchinson, 2000: 47), the latter classification focuses on function and is more useful for occupational therapists.

The researcher supports the classification of Grover and the AAMR as: "Occupational therapy includes the study of human occupations in relation to personal health, life satisfaction, and sense of well-being and the management of the adaptive behaviour or competent performance required to perform these occupations" (Reed & Sanderson, 1999: 10). Both classifications focus on the function of the person.

The diagnostic criteria of intellectual impairment reveal that all areas of occupational performance are affected. The affected occupational areas will also depend on other factors such as medical condition and severity of intellectual impairment. According to York (in Hansen & Atchinson, 2000: 50) "when intellectual impairment occurs without additional diagnoses, the cognitive, psychological, social, and self-management performance components will be most affected. When both physical and mental impairment are present, dysfunction will be more pervasive".

Bachner and Ross (1998: 151) have stated that there has been great controversy regarding intellectual impairment over the past 130 years. In the 19th century, training schools were on the foreground and therefore the notion that people with intellectual impairment can be cured through education and training was supported. During the

early 20th century, professional people believed that there was very little that could be done for people with intellectual impairment. The family and the community were of the opinion that placement within an institution was the best option. By 1960 much had been learned regarding intellectual impairment and the realisation came that people with intellectual impairment would be empowered by reintegration into the community. Since the trend of de-institutionalisation, community-based rehabilitation has become the focus in South Africa. This has placed an emphasis on adequate community facilities for people with psychosocial diagnoses. The purpose of community-based rehabilitation is to assist the client to live as normal and satisfying a life as possible within his/her community.

2.3 Vocational rehabilitation

"Today in the era of self-determination, handicapped people do not want to be hired because they are handicapped. Nor do they want to be denied a job because of their handicapping condition. Rather they want to be treated as others are treated. They want an equal chance to demonstrate their abilities and to live up to their potential. They want equal access to education, training and employment. They want to prove that they are people who can do the work and they want others to stop thinking about the handicapping condition" (Nesbitt, 1977: 56).

The above statement is supported by the researcher as it is still relevant in 2005. As occupational therapists we can assist with facilitating equal access to employment for people with disabilities. The American Occupational Therapy Association (AOTA) published an official document titled *The Role of Occupational Therapy in the Vocational Rehabilitation Process* (Jacobs, 1985: 1) in 1980. AOTA described the role of the occupational therapist in vocational rehabilitation as follows: "Occupational therapy is based upon the fundamental belief that the engagement in purposeful activity, including both the interpersonal and environmental dimensions, may prevent or remediate dysfunction and elicit maximum performance in the work role adaptation. The principles of occupational therapy practice, as they relate to the vocational process, are applied through the provision of a planned and orderly sequence of services designed to prepare the individual for vocational evaluation, training and eventual employment or the highest degree of independent function. The specific aims of occupational therapy treatment are to assist the individual to recover or to develop competence in the physical, psychological, social and economic aspects of daily living and to provide

opportunities to learn those skills needed for adaptation in educational, work, home and community environments”.

According to Van Lierop and Nijhuis (2000: 263), “the process of vocational rehabilitation includes all those activities that are designed to analyse the starting position of workers with disability conditions and to use that assessment as a basis for developing an individually tailored reintegration plan. The reintegration scheme will include all those activities that are needed to increase the individual’s opportunities in the labour market”.

The following process of vocational rehabilitation is used by the Department of Occupational Therapy, University of Stellenbosch, for the training of their students:

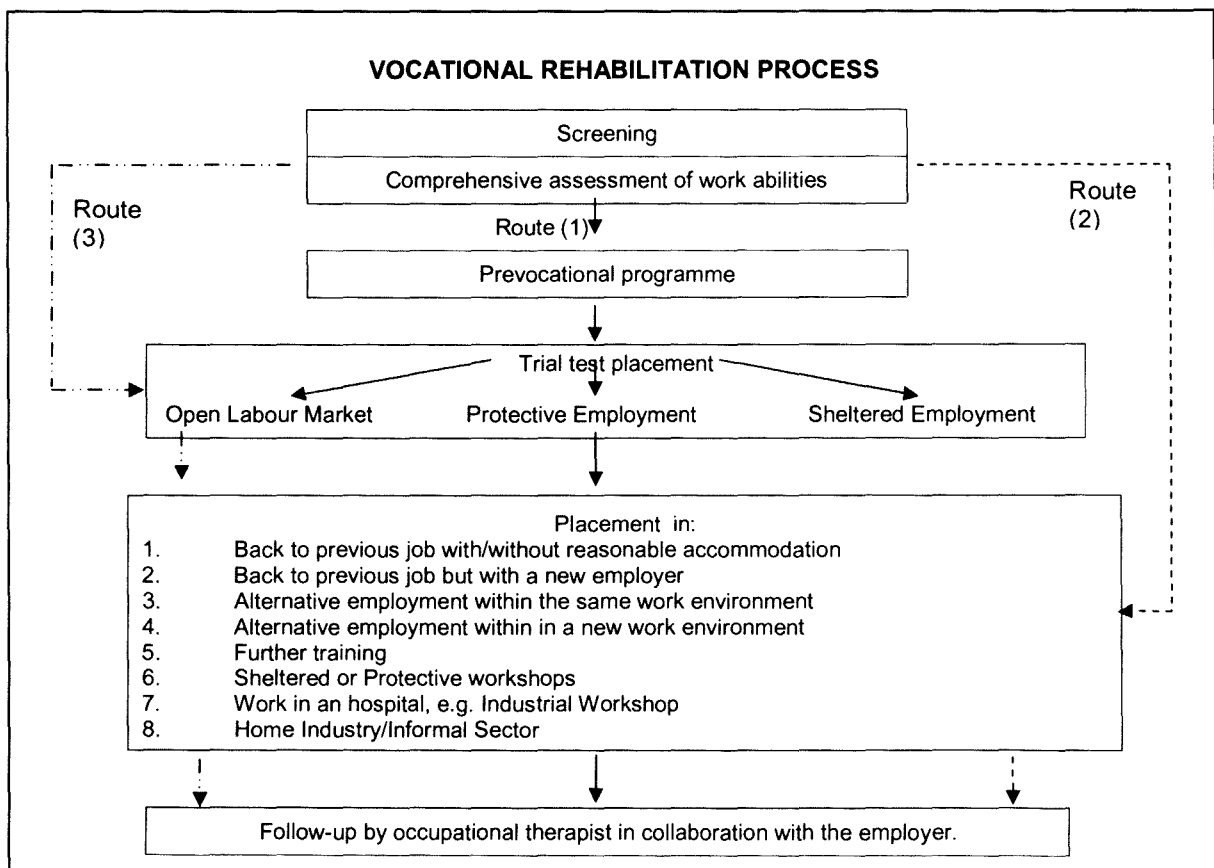


Figure 2.1: Vocational rehabilitation process

Source: Department of Occupational Therapy: Vocational Rehabilitation notes, 1999: 1.

The vocational rehabilitation process presents three possible routes that a client can follow. The three routes are illustrated in Figure 2.1, as indicated by the three different

pathways. The process starts with screening. During screening the therapist is able to determine the client's work potential. Subsequent to screening the client can be referred for a comprehensive assessment of his/her work competencies. This could be followed by a prevocational programme to improve the client's work abilities, trial test placement or placement as indicated in Figure 2.1 (route 1). The client could also be placed in the eight different placements setting as indicated in Figure 2.1 (route 2) after a comprehensive assessment. A comprehensive assessment could also be followed by placement in the open labour market (route 3). The four main areas of placement are indicated as (Department of National Health and Population Development, 1987):

- Open labour market – The worker needs to maintain an 80-100% production.
- Sheltered employment – This is for a worker who cannot compete in the open labour market. They need to maintain a 50-80% production in relation to the open labour market requirements.
- Protective labour market – The worker needs to maintain a 50% production in relation to the open labour market requirements.
- Home industries – The worker is able to make and sell articles from the house.

Although the term 'work preparation programme' is often used synonymously with the term 'prevocational programme', the term 'prevocational programme' will be used throughout this text.

The occupational therapist needs to assess the client's work behaviour and vocational potential through the application of functional vocational assessment techniques before any planning for the development of a prevocational programme can be commenced. Functional vocational assessment is defined as: "The focus on what an individual can do, learn and achieve. It does not simply recount academic, intellectual or physical deficits. Functional assessments emphasise skills in natural environments and help to identify needed training supports and/or potential accommodations or adaptations. Functional vocational assessments can help ensure that the implications of the young adult's strengths and needs are addressed when planning for employment" (Louisiana Statewide Transition Project, 1999). The information gathered during the assessment is used to plan an appropriate prevocational programme. The following factors need to be

taken into account during the development phase of the prevocational programme (Jacobs, 1985: 15):

- The interest of the client
- The client's aspirations and interest regarding future employment
- Realism of the client's job goals
- The client's job experience
- Work available to the client, particularly in his or her local community
- The type of budget for developing and operating the programme
- Access to equipment and supplies for use in the programme
- Physical space available for the programme
- The support of the administration and staff of the facility

The above-mentioned factors have an influence on the success of the prevocational programme. These factors help the therapist to cater for the needs of the client and make treatment goals more realistic.

After completion of the programme, optimal training might be recommended and job placement can take place to enable clients to work. Placement can be on trial basis or placement in one of the eight areas indicated in Figure 2.1. After placement has occurred, the therapist needs to follow up on the client.

Legislation within the South African context has given rise to a new interest in and focus on vocational rehabilitation in South Africa. The Presidential Review Commission Report (1998) as reported in the Public Service Commission (2002: 2), Report on Disability Equity in the South African Public Service supports the notion that government is committed to "... a more proactive, integrated and development strategy" with respect to people with disabilities in South Africa.

The workplace has become more demanding. Employees have to be highly skilled, flexible and adaptable to cope with the changing and competitive world, which places greater occupational stress on those with mental health problems who seek work in the open labour market. A study done by Emerson (Gitlesen & Holden, 2003: 324) indicated that 5-10% of the population of people with intellectual impairment present with challenging behaviours such as self-injurious behaviour, aggression towards others, destruction of property, inappropriate social and sexual conduct, screaming, non-

compliance and eating inedible objects. Gitlesen and Holden (2003: 330) indicated an association between challenging behaviour and psychiatric symptoms.

Many variables need to be taken into account when planning and implementing a prevocational programme for adults with intellectual impairment because of their fear of failure. This fear causes them to have difficulty in making transitions and adapting to change. According to Jacobs (1985: 137) other problems that they encounter are:

- Poor organisational skills
- Inability to manage time requirements
- Poor social co-operation with co-workers
- Problem solving
- Inconsistencies in work habits and work competencies
- Adaptation of medication and inconsistent use or disuse thereof

Psychosocial work programmes therefore play an important role in enabling people to identify their strengths and weaknesses, evaluate their work performance, develop skills and set realistic future goals (Hallam & Leach, 1997: 128). Some clients will be able to return to the open labour market, others will need to be placed in a protective work environment.

In South Africa, people with intellectual impairment who cannot work in the open labour market are mostly employed at protective workshops. Protective workshops provide placement and training for people with severe disabilities who cannot secure employment within the open labour market and offer a protected and supportive working environment. The client needs to go through a process of assessment, individualised programme planning, programme implementation and placement within that setting. A study done by Uys (1991: 200) has indicated the reasons why it is important for clients to work in a protective workshop as: nature and severity of a person's disability, limited formal qualifications, negative attitude of employees towards people with disabilities, availability of suitable employment, the person with a disability is not easily accepted in the labour force and the person with a disability might not be ready for employment in the open labour market. The main source of clientele for protective workshops is learners from schools for learners with special needs.

Protective workshops need to offer workers opportunities for optimal development of their work abilities and the maintenance thereof. The Department of National Health and Population Development (November 1987) has recommended that social skills activities also need to be incorporated into a protective workshop programme.

Jacobs (1985) describes prevocational programmes in different settings for adults with psychosocial problems. The basis of all programmes is that clients are assessed and placed according to their level of functioning within a specific programme. These clients can also advance to a different functioning level within a workplace setting.

An example of a prevocational programme is the programme being offered at The Little People's/Learning Prep School in America. This is a private, non-profit day programme offering services to clients with moderate to severe learning disabilities. The occupational therapy department introduced work programmes to develop work-related behaviours. The clients are assessed and accordingly assigned to four different levels to indicate the kind of programme that is recommended. Level A marks the lowest level of functioning and level D indicates highest level of functioning. Progression from one level to the next is based on the client's ability to manage the staff ratio, length of session and performance demands of the next level. The focus at level A is on the introduction of training in work-related behaviours, working without disruption, independent transit and communicating of basic needs. Clients who have reached level D are referred for work placement in volunteer, sheltered or competitive settings (Jacobs, 1985). This classification and division of workers corresponds to the recommendations made by the Department of Social Services and Poverty Alleviation in the Western Cape (*Operational Manual for Protective Workshops*, 2001).

Evans, Bond, Meyer, Kim, Lysaker, Gibson and Tunis (2004: 1) stated that cognitive impairment plays a critical role in the success of both the social and occupational domains of outcomes. Executive functioning abilities, verbal memory and vigilance are related to work performance, social functioning and performing basic self-care activities (Evans *et al.*, 2004: 2). A study conducted by McGurk and Meltzer (2000) reported that cognitive functioning was associated with employment status. McGurk and Meltzer (2000: 183) found that specific areas of cognitive functioning namely executive functioning, working memory, verbal learning and memory, and vigilance are associated with vocational functioning. These areas of cognitive functioning correspond with the areas of cognitive functioning as reported by Evans *et al.* (2004: 2).

According to Raymond and Matson (Matson, Mayville & Lott, 2002: 176), social skills comprise a defining problem for people with intellectual impairment. People who are classified as severely or profoundly intellectually impaired have greater problems with regard to social skills. Ciponi and Spooner in Matson *et al.* (2002: 176) have stated that “communication and overall social skills are so low that often the individual may resort to extreme forms of maladaptive behaviour to gain reinforcement, or escape environments they find unpleasant”. This maladaptive behaviour has a big influence on the social presentation of a worker at work. Few studies have been done to investigate the social skills of persons with severe to profound intellectual impairment (Matson *et al.*, 2002: 182). This presents the occupational therapist with the challenge of developing a social skills programme for workers with severe to profound intellectual impairment in the protective workshop.

2.4 Cognitive disabilities model

Claudia Allen, an occupational therapist, developed the Cognitive Disabilities Model in 1973, based on observations she made when treating clients with psychiatric diagnoses. Allen wanted to understand the performance limitations experienced by a client as a result of a psychiatric diagnosis. This model is now being applied to other groups of clients with cognitive limitations (Kielhofner, 1992: 107). According to the model, neurological problems can lead to limitations in cognitive capacity. This limited cognitive capacity leads to a restriction in performance. These cognitive limitations are described as cognitive levels on a continuum that is graded from normal (level 6) to profoundly impaired (level 1) function (Kielhofner, 1992: 107). The core of the model is the cognitive levels that are used to describe the degree of functional limitation.

The Cognitive Disabilities Model makes use of different concepts and is interdisciplinary, being based on work from Piaget, in terms of cognition, neuroscience, the medical model and the World Health Organisation system for classifying impairment, disabilities and handicap (Kielhofner, 1992: 118). According to Allen, quoted in Reed and Sanderson, this model differs from other models, as it is designed to incorporate changes in the ability to function that would happen regardless of disability, difficulty in capacity to learn and the existence of chronic mental disorders such as intellectual impairment, cerebral palsy, Alzheimer's disease, and affective disorders (Reed & Sanderson, 1999: 255).

According to Kielhofner (1992: 107), Allen originally expected that cognitive capacities could be redeveloped in persons who had lost them. She later abandoned the idea as she assumed that these cognitive capacities were permanently impaired in persons with chronic psychiatric illness and persons with brain damage. The Cognitive Disabilities Model recommended a shift from the view of changing an individual through therapy. Allen avoided making use of theories that assumed learning and normal memory as she asserts that these capacities are permanently impaired in persons suffering from chronic psychiatric illness and persons with brain damage.

The Cognitive Disabilities Model is currently moving away from a medical model as it focuses on the functional limitations that result from disease which causes impaired cognition, and Allen emphasises occupational therapy's concentration on adjustment to residual limitations (Kielhofner, 1992: 108). Allen (1999: 1) moved the emphasis back to the influence of structuralism and she now refers to the Cognitive Disabilities Model as the Functional Information Processing Model (FIPM). Refer to Figure 2.2 for an outline of the FIPM. The researcher will hereafter refer to the Cognitive Disabilities Model as the FIPM.

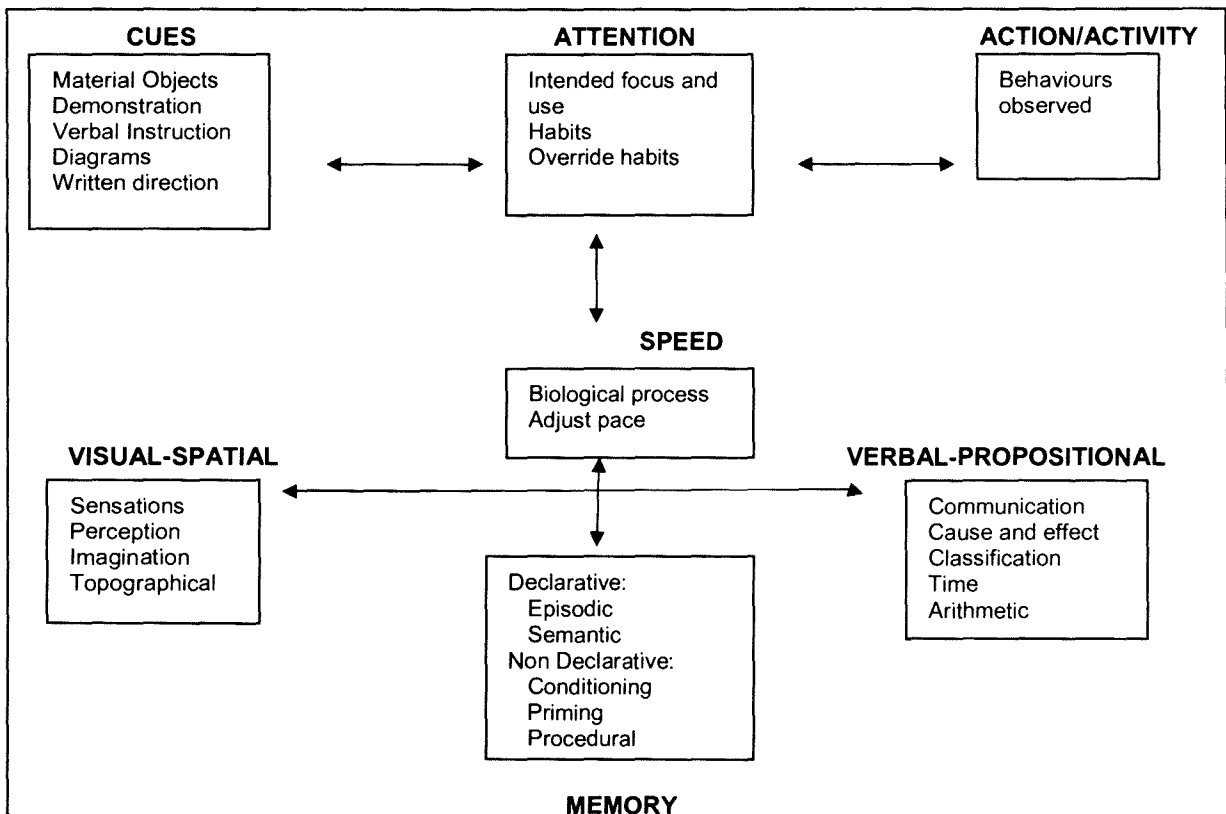


Figure 2.2: Functional information processing system: working memory
 Source: Allen, 1999: 6.

According to Allen (1999: 4), the FIPM (refer to Figure 2.2) describes the mental processes used to guide actions, activities and roles. Cues, attention and action/activity/role are a part of the information-processing model used in developmental psychology and speed, visual spatial processes and verbal propositional processes are features of cognitive psychology. The FIPM can be seen as an input and output system. The inputs are the attention to sensory cues and the outputs are the actions, activities and/or roles. The throughputs are inferences derived from the inputs and outputs. Throughputs therefore indicate conscious awareness of purpose, experience and time (Allen, 1985: 40). These inferences attempt to describe the mental structures that guide behaviour. The FIPM does not describe the development of intelligence, nor does it describe normal intelligence.

Allen (1999: 5) stresses three important points:

1. The FIPM describes the use of remaining abilities when the brain is “disabled”.
2. It is not a disability model. The purpose of the FIPM is to assist in clarifying remaining capacities in a “disabled” brain.
3. Remaining abilities that are still present are influenced by the age of onset of the brain’s “disability”. The FIPM identifies memories that can be applied in everyday functioning.

“The Functional Information Processing Model addresses living successfully through using the person’s best ability to function at the present time” (Allen, 1999: 5).

Limited research exists on the FIPM. Most studies focus on the reliability and validity studies of the ACLS and Routine Task Inventory (RTI). The researcher made use of the critical analysis done by Kielhofner (1992) as motivation for the use of the FIPM in the research study.

2.4.1 Assumptions of the FIPM

Allen listed the following six assumptions about cognitive disability that can be used to guide evaluation and treatment (Grant, 2003: 262):

1. “The severity of mental disorder can be judged by the consequences it has on a person’s capacity to think, do and learn.

2. Learning psychological substitutes for normal mental processes can compensate for mild mental disorders.
3. Severe mental disorders can be associated with limited mental abilities that cannot be corrected by what the person says or does.
4. Severe mental disorders can be compensated for by providing environmental substitutes for normal mental processes and identifying normal processes that can still be used.
5. The remaining mental abilities can be engaged to facilitate realistic activities that are meaningful to the client, practical for caregivers and sustainable over time.
6. When people are unable to learn to use psychological compensations effectively, environmental compensations can improve the quality of life for them and their long-term caregivers”.

According to Grant (2003: 262), the therapist identifies the underlying mental structures of an activity to predict similar performance in other activities. Successful performance of an activity occurs when there is a fit between the mental structures available to the client and demands of an activity. Persons with intellectual impairment need to be engaged in purposeful activities through environmental compensation and supported by caregivers to enhance their quality of life. Providing support and environmental compensation can enable the person with intellectual impairment to be engaged in activities that are meaningful and to be productive in a workplace.

2.4.2 Theoretical arguments of the FIPM

The theoretical arguments discussion is the basis of the motivation for the use of the FIPM in the study.

Voluntary motor actions are the primary focus of the FIPM. According to Allen (1985: 6), “voluntary motor actions are a behavioural response to a sensory cue that is guided by the mind”. Allen focuses on voluntary motor behaviours that occur in routine tasks. Routine tasks are activities that a person does each day (Allen, 1985: 9). Allen argues that this is most important to clients and others in their environment, e.g. family. Kielhofner (1992: 108) has pointed out that communication abilities have also been

incorporated in the FIPM, which now focuses on voluntary motor behaviours and communication abilities.

Normal function is defined in terms of the relationships of the brain, cognition and task behaviour. Behaviour is guided by cognition. The focus is on the role of cognition in task performance and not on the brain-cognition relationship. Two main features of cognition are: cognitive dimensions of task performance and the continuum of cognitive functioning (Kielhofner, 1992: 109).

The term 'cognitive dimensions of task performance' is used to describe qualities of task performance across the cognitive levels. Cognitive dimensions of task performance are:

- Attention – “selective responses to sensory cues”.
- Behaviour – “actions exhibited in task performance”.
- Purpose – “intended objective, which guides the motor response to a sensory cue”.
- Experience – “what a person goes through when he or she is involved in a task”.
- Process – “course of action followed to achieve a purpose”.
- Time - “duration over which a person sustains sensory-motor associations as manifested in ongoing voluntary motor responses to sensory cues”. (Kielhofner, 1992: 109)

The continuum of function and dysfunction is divided into six cognitive levels (referred to as ACL) as described in Table 2.4:

Table 2.4: Summary of Allen cognitive levels

TITLE	COGNITIVE LEVEL	DESCRIPTION
Planned Activities	6.0	Able to think about actions before performing them; considers the needs of others; attends to abstract cues. The potential outcome of an action, safety hazards, and social expectation.
Independent Learning	5.0	Able to explore new actions and make fine motor adjustments; attends to surface properties, spatial properties, feelings; remembers the effects of previous actions to learn new activities.
Goal-directed Learning	4.0	Able to complete a goal, perform self-care independently and comply with directions; attends to eye-catching visual cues, familiar actions that accomplish a goal, possessions and errors.
Manual Actions	3.0	Able to handle objects, follows one-step cues within the context of familiar activity and repeat/learn movement patterns; attends to gross hand use and size, shape and function of familiar objects.
Postural Actions	2.0	Able to move body for sitting, standing, walking and balance; attends to barriers in environment and large objects.
Automatic Actions	1.0	Able to use protective responses (withdrawing from noxious stimuli); attends to all five senses with focus on survival.
Coma	0.0- 0.8	Unconscious, no response to stimuli or reflexive responses (flexion-extension, eyes, hands and mouth open and close spontaneously)

Source: Grant, 2003: 262.

Only ACL 3 will be discussed, as the focus of the study was on the workers who scored an ACL 3 on the ACLS.

Table 2.5: Summary of ACL 3

	ASSETS	LIMITATIONS
ATTENTION	<ul style="list-style-type: none"> ▪ Shift from internal to external. ▪ Tactile attention cues. ▪ Physical objects in external environment suggest a motor action. ▪ Attention to exterior surfaces of objects. 	<ul style="list-style-type: none"> ▪ Restricted to what can be touched and manipulated. ▪ Visual and auditory cues do not have much meaning.
MOTOR ACTIONS	<ul style="list-style-type: none"> ▪ Uses hands to manipulate objects. ▪ Manual action is initiated by another person demonstrating the motion or by chance. ▪ A manual action can be imitated. ▪ Manual actions are sustained by repetitive actions. ▪ The repetitive action may continue until an obvious stopping place has been reached. 	<ul style="list-style-type: none"> ▪ Behaviour is inappropriate and unpredictable. ▪ Manual actions are not goal directed. ▪ Imitation of only concrete manipulations of material, objects and one action at a time. ▪ Poor quality of actions.
CONSCIOUS AWARENESS	<ul style="list-style-type: none"> ▪ Material objects are manipulated because the properties are interesting. ▪ Tactile cues and manual actions provide the sensation of touching. ▪ Aware of cause-and-effect relationship. 	<ul style="list-style-type: none"> ▪ Understanding of external environment is restricted to their own actions on objects; other cause-and-effect relationships are usually ignored or misinterpreted. ▪ The motor actions are slow. ▪ Disorientation of time, place and person may be present. ▪ Attention span is defined by the length of time that a repetitive action can be performed. ▪ Attention span is short and easily distracted by other cues in the environment.

Source: Allen, 1999.

The person who functions on an ACL 3 reveals certain limitations in executing daily self-care activities. According to Allen, Blue & Earhart (1995), it is further indicated that a person functioning on an ACL 3 needs moderate assistance in activities of daily living. Twenty-four-hour supervision is needed to safeguard such a person and to guide the person through the steps of an activity.

Mobility is slow but within normal range and endurance is good in the absence of a physical disability. The presence of a physical disability may allow the person to push a wheelchair forwards and backwards, but he or she might not be able to turn corners. These assistive devices might not be used safely.

The person is dependent on assistance to perform self-care activities. Caregiver assistance is required to place familiar objects in front of the person and sequence him/her through the steps of the activity and to check the quality of performance.

The person can communicate vital needs and name familiar objects and actions. He/she might not ask for help when in mild discomfort or may speak without considering the comprehension of the listener.

The impact of cognitive disabilities on daily activity performance for a person functioning on an ACL 3 therefore involves profound disruption, necessitating continuous supervision by caregivers.

According to Earhart, as stated in Allen *et al.* (1992: 125), it is important to decide which activities are safe so that they can be attempted by a person with a disability. The occupational therapist working in a protective workshop plays a vital role in making this decision.

The FIPM has specific therapeutic interventions in terms of specified assessment and treatment approaches. According to the FIPM the changes in cognitive level occur in the natural course of the disease or as a result of medication and not as a result of occupational therapy. Participation in activities by a person with brain disorder is not expected to result in learning, as brain disorders place a restriction on learning. Allen (Kielhofner, 1992:111) argues that other factors, e.g. medication or natural healing of a process, have a better effect on changes of cognition. "Allen has qualified that occupational therapy may be associated with changes in cognitive level, but does not claim causative link" (Kielhofner, 1992: 111). The FIPM attempts to describe the extent of the cognitive disability and the degree of functional limitation present in a person. The information obtained by means of the FIPM is used by the occupational therapist in treating the person.

The FIPM proposes three assessment methods:

- Routine Task Inventory (RTI) – This is used to assess the client's ability to perform routine tasks such as grooming, dressing and bathing. Each task is described according to the six cognitive levels of performance and the client's reported or observed performance is matched with the description. This enables the occupational therapist to determine the client's level of cognitive functioning.
- ACLS – This test determines the client's cognitive level of participation in a single activity.
- The lower cognitive level test – This is designed to be used for clients who function on an ACL 1 and 2.

The ACLS was used as a measuring instrument for the present study. This was decided on as it involves a single activity, can be done in a short period of time, uses a standardised method of presenting the test and scoring of performance, is cost-effective in terms of money and time, and can be used in combination with observations of task performance. The ACLS score can be used as an objective measure during the assessment of clients.

When the ACLS is used, the occupational therapist begins the assessment with an interview to establish a rapport with the client before administering the ACLS. The ACLS is used to determine the client's cognitive level of functioning. After an ACL has been determined, the occupational therapist may use the handbook "Understanding Cognitive Performance Modes" to predict the client's ability to function relative to the cognitive level (Grant, 2003: 263). This handbook is an essential guide when using the ACLS. It lists abilities and a level-specific safety checklist that can be used to assist in guiding treatment. This handbook was used as a guide in this study to develop the structured activity programme for workers in the occupational group.

The FIPM provides a detailed and specific procedure for task analysis, selection and adaptation of tasks and forms the basis for the client's treatment approach. A person performs an activity in a specific task environment. It is important that there should be a match between the demands of the task and the abilities of a person to ensure optimal task behaviour. The client's ACL can be matched with the requirements of an activity by analysing the activity. If there is no match between the client and the activity,

adaptations can be made to the activity or to the environment in which the client performs the activity. Refer to Figure 2.3 for the relationship between task demand, the person and task behaviour that takes place within a specific environment. People, objects and space needs to be within the client's cognitive ability to interact successfully with the environment (Allen, 1985: 99). The occupational therapist is part of the task environment. The occupational therapist needs to create the opportunity for the client to interact successfully with the environment by providing activities that match the ability of the client.

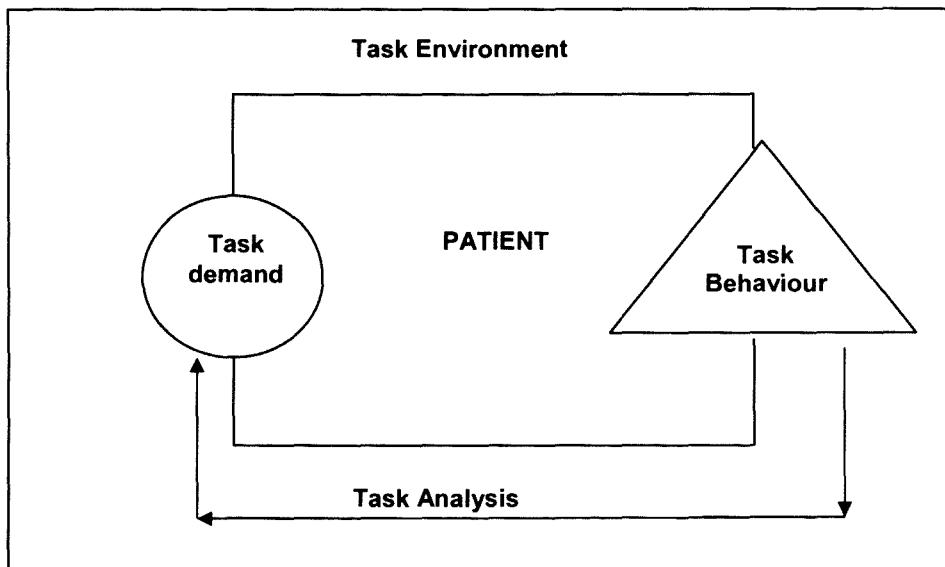


Figure 2.3: The therapist's awareness of the task environment

Source: Kielhofner, 1992: 114.

When looking at task demand, the following need to be considered (Allen, 1985: 83): the material objects; sample; choice; steps of an activity; tool use; potential errors; length of task time; supplies and storage.

Task demands for a person functioning on an ACL 3 are as follows (Allen, 1985: 89):

- A demonstration of the repetitive action is needed.
- Choice of supplies and materials is meaningless as these persons are unable to comprehend why a choice should be made.
- Familiar repetitive actions are executed in a fixed manner.
- Steps of an activity are repeated if the steps are consistent and predictable.

- Hand tools are used out of habit (e.g. a fork) and can be used automatically (e.g. toothbrush) but with poor quality.
- Failure to recognise the outcome of actions.
- Attention span for a task is 30 minutes.
- Some people cannot work and talk at the same time.
- The person will only use supplies that are put in front of him/her.
- Manual action may be repeated until an obvious end suggested by the material object is reached, e.g. the person may continue with work activity until all supplies are finished, but will not fetch more.
- Supervised use of tools and materials is required.
- Access to potentially hazardous materials and objects needs to be restricted.
- Unfamiliar steps need to be completed in preparation before the person functioning on an ACL 3 continues with the activity.
- Distraction occurs due to large number of supplies in direct field of vision.

The above information suggests that the work competence or task behaviour of a person who functions on ACL 3 will be affected as follows:

- Decreased ability to follow verbal and visual instruction. It would be better to demonstrate the required actions
- Poor task planning, task completion and task evaluation
- Poor work endurance
- Poor production speed in terms of quality and quantity
- Poor task completion, which may be interpreted as poor work motivation
- Poor handling of tools and materials

Treatment can start after the occupational therapist has done an assessment. The ACLS is one method of assessment that can be used. Occupational therapy treatment based on the FIPM is based on three treatment approaches (Kielhofner, 1992: 111):

- Palliative treatment that is aimed at reducing symptoms of the illness
- Expectant treatment to “monitor and document the alternations and improvements in functional abilities associated with biological changes in the client’s condition”
- Supportive treatment “aimed at sustaining strength during illness and recovery”

During the acute phase of an illness the occupational therapist makes use of a therapeutic programme. When the client’s condition is more stable, a rehabilitative programme can be implemented. The approach would now be on environmental compensation. The occupational therapist would document the level of cognitive dysfunction and provide a task environment in which a patient can function (Kielhofner, 1992: 112). The main goal during this phase is to identify the optimum environment in which clients can function safely, considering their cognitive limitations.

The FIPM was used in the study to assist the researcher in identifying and adapting the task environment of the workers in the occupational group.

Allen (1985: 221) proposed general objectives for an occupational programme in an acute psychiatric hospital. She also made recommendations regarding staffing patterns, activity schedules, task environment, safety and health requirements, security and in-service training. For the occupational therapist to develop and implement a programme, an accurate description of the client’s functional limitations, activity requirements and the environments in which the client functions is needed. Allen (1985: 224) emphasised that the selection of programme content must be based on the client’s abilities and personal choice. A programme that she developed for a person functioning on an ACL 3 comprised basic craft skills and grooming.

The researcher included crafts, basic grooming and social skills in the structured activity programme in the study.

2.4.3 Research on the FIPM

Research on the FIPM is limited. Most research studies involve reliability and validity studies of the ACLS as part of the FIPM. As several reliability and validity studies have been done on the ACLS, the research results of such studies on the ACLS will therefore be discussed.

In summary, as reported by Unsworth (1999: 92), inter-rater reliability studies have demonstrated a good reliability ($r=0.75-0.99$).

A study undertaken by Velligan, Bow-Thomas, Mahurin, Miller, Dassori and Erdely (1998: 7) demonstrated a correlation between the ACLS and the Functional Needs Assessment (FNA) ($\rho=0.56$, $p<0.0001$). The FNA measures the ability to perform basic Activities of Daily Living (ADL). The results of the study indicated that the ACLS is a valid assessment of a client's current level of adaptive function and general cognitive ability.

A study by Henry, Moore, Quinlivan and Triggs (1998: 639) demonstrated a correlation between the ACL and community functioning ($t=3.653$, $df=89.1$, $p<0.0004$). These results provide evidence that a client's ACL may be a predictor of community functioning.

Penny, Mueser and North (1995: 422) demonstrated a significant correlation between the ACL and the total score of the Social Interaction Scale (SIT) ($r(53) = -0.32$, $p>0.01$), but no significant correlation with the subscale voice quality was found ($r(53) -0.16$). Voice quality refers to volume, tone, pitch, clarity, pace and speech disturbances as related to verbal communication. Verbal communication is very important as a social skill and for communicating effectively at work. A study done by Penny *et al.* (1995: 422) indicated that a higher ACL score was associated with better social skills.

The above-mentioned studies supported the researcher in selecting the ACLS as a measuring tool and in using the results for developing the structured activity programme.

There is a moderate to high correlation between the ACL performance and subtest of the Wechsler Adult Intelligence Scale (WAIS) – Revised ($r=0.28$ to 0.729) (Mayer, 1988: 180). Another study done by Secrest, Wood and Tapp (2000: 131) demonstrated a

significant correlation between the ACL and the Wisconsin Card Sorting Test (WCST) ($p < 0.1$). The WAIS is a psychometric test which tests the IQ of a person and the WCST is used by neurophysiologists to assess executive function.

In a protective workshop, the IQ usually provides the only available information of a person's cognitive development. The ACLS differs from an IQ test in focusing on the client's function and not on the cognitive development. Intelligence tests are used to ascertain the developmental level at which the individual is currently functioning. But IQ can only give an indication of the rate of cognitive development that has taken place up to the time of testing and not of the level of functioning.

David and Riley (1990: 495) found no significant correlation ($p < 0.05$) between the ACLS, the Beck Depression Inventory and the Minnesota Multiphasic Personality Inventory Scales. Significant correlations were found between the ACLS and the Symbol-Digit Modalities Test ($r = 0.251$, $p < 0.001$), the patient's age ($r = -0.424$, $p < 0.0001$), and the following sections of the Shipley Institute of Living Scale: Vocabulary ($r = 0.355$, $p < 0.001$) and IQ ($r = 0.311$, $p < 0.005$). The one part of the results of this study suggests that the ACL appears to be unaffected by the level or dimensions of the client's psychiatric symptomatology. According to David and Riley (1990: 496) a client's ACL may vary with changes in level of psychopathology. The second part of the results indicates that the ACL is a valid measure of cognitive functioning.

Shapiro (1992: 517) found no statistically significant correlation between the ACLS and the Perceptual Memory Task. Correlation of the ACLS with the Developmental Test of Visual-Motor Integration revealed moderate but significant coefficients for raw and age-equivalent scores. This suggests that the ACLS partially measures visuomotor integration.

The use of the ACLS as a measuring instrument in this study is supported by the above findings, as it has been found to be a reliable and valid instrument with predictive qualities.

2.4.4 Strengths and limitations of the FIPM

According to Kielhofner (1992: 115), Allen has argued that "... occupational therapists have overstated the effect of activity in producing change as reflected in treatment goals of increasing, or enhancing, patient capacity". Allen further argued that alternative explanations, e.g. medication, have not been ruled out and that occupational therapists have failed to recognise the permanent deficits of patients with cognitive disabilities.

The researcher is of the opinion that this is in direct conflict with the philosophy of occupational therapy and that the occupational therapist should not limit the client's opportunity to learn or to develop functional performance.

The FIPM has not been adopted by Australian occupational therapists. Hayes and Keller (1999: 190) indicated the reasons for not adopting the FIPM to be a lack of knowledge about cognitive disability training and evidence supporting Allen's cognitive level test. The researcher currently knows of only two institutions in the Western Cape that use the FIPM. The fact that only two institutions use this model presents a research opportunity to identify the use of the FIPM in the Western Cape and to determine how the results correlate with the above-mentioned study done in Australia.

According to Hayes and Keller (1999: 190) the main criticism against the FIPM is based on the belief that a person's level of cognitive functioning cannot change and that a person with a cognitive disability cannot learn. Hayes and Keller (1999: 190) are of the opinion that this belief is incorrect. According to Hayes and Keller (1999: 190), Allen has stated that diagnoses such as schizophrenia reveal cognitive disability which has an impact on functional performance and that neurologically based deficits in cognitive processing cannot be corrected through therapy. This notion is supported in the literature. But the notion regarding the inability to learn is inaccurate as Allen has stated that an affected person can learn very basic things. Hayes and Keller (1999: 191) suggested that it is the occupational therapist who does not have the time to use repetition to train basic skills which cannot be generalised beyond the context in which it has been taught. Hayes and Keller (1999: 191) have acknowledged that cognitive levels do fluctuate. These fluctuations can be due to environmental factors, medication, illicit substances, interpersonal factors, physical illness, and the exacerbation and remission of positive symptoms.

According to Grant (2003: 263) and Hagedorn (1997: 132), the FIPM is an effective method for quickly identifying a disturbance in cognition as it relates to everyday functioning; assists in identifying the client's potential functioning in relation to underlying mental structures, has a simple set of diagnostic assessments, and its concepts are coherent and remove the professional frustration resulting from failure to achieve improvement. Limitations of the FIPM are that it moves away from the belief that activity improves physical and mental well-being, that it can detect a change in the mental structures but does not effect the change, that the concepts related to the higher cognitive levels are not clearly defined and that clients in institutional settings can be labelled.

According to Grant (2003: 264), "the cognitive disability model is effective in the evaluation and treatment of a person's adaptive functioning relative to cognitive ability. The model can be applied in a variety of settings. It can assist the occupational therapist to establish a quick and accurate understanding of a person's present cognitive functioning as it relates to daily activity".

The researcher is of the opinion that the FIPM can be used to understand the functional performance of a person with intellectual impairment in the workplace. It can assist the occupational therapist working in a protective workshop with the assessment of the worker's functional limitations and assets. Clear guidelines are given regarding activity requirements and environmental adaptations, thus making it easier for the therapist in providing activities that are therapeutic and meaningful to the workers. According to Allen, in Kielhofner (1992:115), "... activities provide persons opportunity to use remaining capacities, thereby achieving meaningful involvement and a rightful place in community life". Grant (2003: 263) reasons that the cognitive levels can be effectively used in determining the type of environmental and/or social support indicated to facilitate a client's best ability to function.

2.5 Conclusion

The researcher believes that protective workshops play a key role in the employment of persons with intellectual impairment. They assist in providing and sustaining employment for persons with intellectual impairment.

A study done by Pierce, McDermott and Butkus (2003: 369-380) in South Carolina has indicated that 22,7% of persons with intellectual impairment were employed over a four-year period and that 68% of this group sustained their jobs in each year. It is therefore clear that the employment needs of the remaining 77,3% must be catered for.

According to Lee, Belfiore and Toro-Zambrana (2001: 334), workers are motivated to do a work task if they are allowed to choose a more preferred vocational activity as opposed to being assigned to work on a non-preferred work task. Giving the worker a choice leads to an increase in motivated behaviour and longer time spent on the work task, although longer time spent on a work task does not mean increase in productivity to a competitive level. Productivity is very important for placement in a more integrated setting, e.g. sheltered or supported employment when it comes to workers with intellectual impairment. According to Lee *et al.* (2001: 334), low productivity is often one of the reasons why people with severe disabilities lose their jobs. In the case of the worker with intellectual impairment low productivity could be due to poor motivation, too high task demand, poor task planning, not identifying mistakes and inconsistency in work habits and work competencies. Lee *et al.* (2001: 334) have identified one of the reasons to be the inability of the worker, supervisors, trainers and employers to identify the most efficient way to complete a task. The occupational therapist plays an important role in identifying the most efficient method of doing a work task.

The importance of vocational programmes for people with intellectual impairment is highlighted by the above-mentioned statistics quoted from Pierce *et al.* (2003: 369-380). According to Partridge (1997: 238), the World Health Organisation promotes the importance of vocational rehabilitation to enable a disabled person to secure and retain suitable employment. Murakami (1999: 181) has pointed out the importance of focusing on the following:

- Objective assessment of the characteristics of disabilities and the work competence of clients
- Judging the appropriate clusters of work
- Promoting the realisation of the client's situation and motivation
- Improvement of essential skills necessary for employment

An effective prevocational programme would do better to focus on compensatory strategies for clients' cognitive deficits rather than try to remediate these deficits. According to Reed and Sanderson (1999: 256), the FIPM provides environmental compensation for people with severe cognitive or mental disabilities.

The relationship between employment and intellectual impairment has been discussed. Literature indicated that the FIPM can be used to develop programmes for persons with intellectual impairment.

In Chapter 3 the researcher will discuss the process followed to develop and implement a structured activity programme for an occupational group in a protective workshop. The FIPM will be used as a frame of reference and post-testing of workers, using the ACLS to identify a change in the cognitive level of functioning of workers in the occupational group.

CHAPTER 3

STUDY SAMPLE, MEASURING INSTRUMENT AND DATA GATHERING

3.1 Introduction

The aim of the study was to investigate whether the structured activity programme implemented in a protective workshop in the southern suburbs of Cape Town, Western Cape, brought a change to the level of cognitive functioning of workers with intellectual impairment. The ACLS was re-administered to evaluate and identify whether any changes were brought about by the structured activity programme.

The following hypotheses were formulated:

H0 – There is no change in the level of cognitive functioning of the workers in the occupational group after participation in a structured activity programme.

H1 – There is a change in the level of cognitive functioning of the workers in the occupational group after participation in a structured activity programme.

This chapter will discuss the study sample, measuring instrument, the data gathering procedure, aspects of bias and ethics in the study.

3.2 Study sample

A request from a protective workshop for adults with intellectual impairment (with 108 workers at the time) was directed to the researcher for assistance with the assessment and placement of the workers within the various areas of the protective workshop.

The researcher used a saturation sample, as all the workers employed in the occupational group of the protective workshop were assessed using the ACLS.

The target population was identified by means of the following inclusion and exclusion criteria.

Inclusion criteria:

- All workers (male and female) participating in the occupational group of the workshop during the period January 2001 to June 2002.
- All workers with a cognitive level function between 3.0 and 3.8 as measured by the ACLS.

Exclusion criteria:

- Any person who was hospitalised or was absent every week for more than three times per week during the period January 2001 to June 2002.
- All workers with a cognitive level function between 4.0 and 5.8.

The occupational group consisted of 24 workers. Four workers were excluded according to the exclusion criteria. Only 20 (n=20) of the workers in the occupational group met the inclusion criteria.

The ages of the 20 workers ranged from 23 to 56 years. Fifty per cent of the workers were male and 50% of the workers were female. Nineteen of the 20 workers had attended a school for learners with special needs and one worker had attended a special class in the mainstream school. Fifty per cent of the workers were on medication. The name of the medication, indication, dosage, period of use of medication and compliance were unknown. The researcher also had no knowledge of the diagnoses, medical history and physical or psychiatric problems of the workers as this information was not available on the area file of the workers. The researcher was not allowed to contact the family of the workers as the organisation did not give the researcher permission to contact the family. Permission was granted on the basis that the families not be contacted. The family gave permission to the participating organisation for the research.

3.3 Measuring instrument

The collection of data for this study was done by means of the ACLS. The ACLS is an initial performance measure that can be administered to patients functioning at cognitive

levels 3 to 5. It is important to note that the ACLS only serves as a screening method and must be verified by other means, e.g. participation in activities or other cognitive tests such as the Chessington Occupational Therapy Neurological Assessment Battery (COTNAB). The ACLS is usually administered at the end of the initial interview.

The ACLS consists of a leather-lacing task in which a person is requested to replicate three different leather-lacing stitches. No time limits are involved. The test has standardised instructions and a scoring system. Allen *et al.* (1992: 34) describe the ACLS as a visuomotor task that provides an estimate of a person's ability to learn to do other visuomotor tasks.

Several reliability and validity studies have been done on the ACLS as reported in Chapter 2.

3.4 Data gathering

Refer to Figure 3.1 for a diagrammatic representation of the process followed to gather the data.

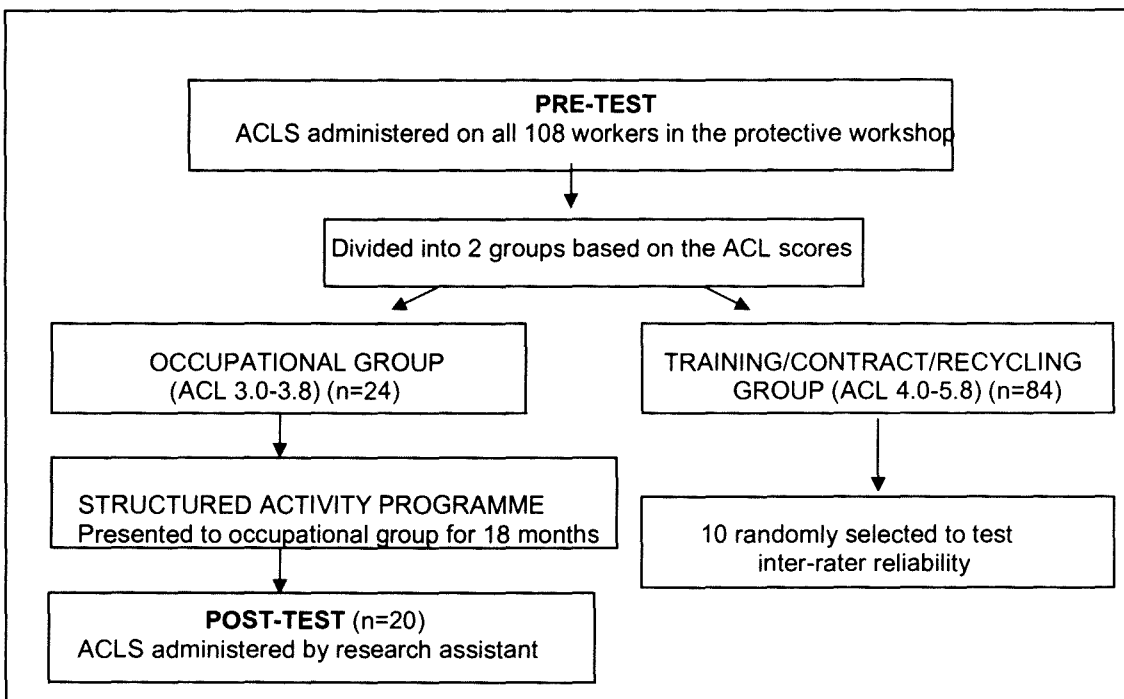


Figure 3.1: Diagrammatic representation of data gathering process

3.4.1 Pre-test

All 108 workers were assessed by the researcher within a period of two weeks. Greater co-operation was achieved by informal interviews to the workers before administration of the test. This was done to build a rapport with the workers. Using the ACLS test to assess each worker's ACL took an average of 15 minutes per worker.

Workers were divided into different groups according to their ACL scores. Workers with an ACL between 3.0 and 3.8 were placed in the occupational group and workers with an ACL of 4.0-5.8 were placed in the training, contract or recycling work groups. The grouping of workers was based on the description of the functioning in each ACL and the matching of these descriptions with the requirements of each of the tasks in the different work groups. The work groups corresponded with the placement of workers in a protective workshop as indicated by the *Operational Manual for Protective Workshops* (Department of Social Services: March 2001).

The researcher was required to assist with the development of a programme for the occupational group. The purpose was to provide structure and purpose to the daily programme of the workers in the occupational group. The workers functioning on an ACL 3 were the lower functioning workers within the protective workshop who, as stated in Chapter 2, were easily distracted and lacked goal-directed behaviour. Such behaviour affected the production of the protective workshop and also had an influence on the other workers. This influence led to daily conflict due to the low frustration tolerance of the workers.

3.4.2 Design and implementation of the structured activity programme

Descriptors of ACL 3 as described by Allen *et al.* (1995), as discussed in Chapter 2, were put together to form the baseline of the workers' functioning. Refer to Table 3.1 for a summary of the description of a person functioning on an ACL 3.

Table 3.1 Level 3: manual actions

ACL	MANUAL ACTION	BEHAVING	SPEAKING	TIMING
3.0	Grasping objects	Grasps or throws objects; walks away	Names a few objects	Slow response; sustains grasp for a few seconds or holds on until removed
3.2	Distinguishing objects	Uses associated action of object; random placement of object	Names object; names home/hospital	Starts and stops on command
3.4	Sustaining actions on objects	Repetitive actions; may follow left to right	Names actions; speaks without considering comprehension of listener	Duration of sustained action; distractible
3.6	Noting effects on objects	Notes shape; linear or perimeter placement	Names shapes; message related to vital need	Will wait for effect when cued
3.8	Using all objects	Covers space or uses all supplies	"I'm done"; may not ask for help in discomfort; may accept discomfort or abandon task	Sense of completion; duration of sustained action determined by available objects

Source: Allen, Earhart and Blue, 1992: 91.

Before the development of the structured activity programme, the researcher had to obtain information regarding time scheduling of the protective workshop, staff allocation to the occupational group, budget and area of where the group would work.

The treatment goals as stated by Allen *et al.* (1992) and Allen *et al.* (1995) were used in the planning of the programme and selection of appropriate activities. Activities were analysed in terms of their inherent requirements and matched to the functioning characteristics of the worker (ALC 3) to further justify inclusion into the programme. It was also regarded as important for persons to have the ability to do a particular activity to allow choice in doing the activity. People with intellectual impairment are usually faced with activities and behaviours that are not on their level of ability. They have to perform activities in which their abilities and activity requirements do not match. Matching activities with the worker's ability is important for maintaining the intrinsic motivation of the worker.

The researcher used the following guidelines for the development of the structured activity programme for the occupational group:

- A variety of repetitive activities of short of duration needed to be included in the programme.
- Slow motor actions required that the steps of an activity, tools and material should not require quick reaction time
- Task demands as discussed in Chapter 2
- Task behaviours as indicated in Table 3.1
- Facilities – room, size and equipment
- Programme had to suit allocated budget
- Staff allocation determined the structure of the groups

The aims of the programme were derived from Jacobs (1985).

The long-term aim of the activity group programme was to:

- Assist the worker to develop maximal occupational performance, thereby preventing or minimising the negative effects of long-term institutionalisation.

The short-term aims of the programme were to:

- Promote work abilities and occupational skills.
- Encourage independence in personal maintenance activities.
- Encourage effective development and competency in social skills (communication and interpersonal relationships).
- Improve self-esteem.
- Expand life experiences and coping skills.

The outline of the programme is presented in table 3.2:

Table 3.2 Occupational group programme

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
08:15-08:30	Register	Register	Register	Register	Register
08:30-09:00	Climate Meeting	Climate Meeting	Climate Meeting	Climate Meeting	Climate Meeting
09:00-09:30	Life Skills	Life Skills	Life Skills	Life Skills	Life Skills
09:30-10:00	Preparing Tea	Preparing Tea	Preparing Tea	Preparing Tea	Preparing Tea
10:00-10:15	Tea Time	Tea Time	Tea Time	Tea Time	Tea Time
10:15-12:15	Contract Work	Handwork Activities	Contract Work	Handwork Activities	Contract Work
12:15-12:45	Music Group	Gardening	Music Group	Music Group	Gardening
12:45-13:00	Preparing Tea	Preparing Tea	Preparing Tea	Preparing Tea	Preparing Tea
13:00-13:30	Lunch	Lunch	Lunch	Lunch	Lunch
13:30-15:30	Handwork Activities and Cleaning	Contract Work	Handwork Activities and Cleaning	Contract Work	Games and Cleaning

Allen (1985: 236) has pointed to the importance of including a variety of activities in a treatment programme. The undermentioned was the motivation for the inclusion into the programme.

Signing of the register was used for workers to learn to identify their names and to maintain the ability of those workers who were able to write their names. Those workers who were not able to write their names were able to identify their names and copy them. This assisted the supervisor in keeping attendance records of the workers and took place every day. This activity later became an area task when it became the responsibility of one of the higher functioning workers to check that all the workers had signed in on a daily basis.

The aim of the climate meeting was to encourage communication skills and improve self-esteem. During climate meetings the workers were oriented regarding time (day, month, year, weather). This was incorporated because of the possible disorientation that can be present in a person functioning on an ACL 3 and had to take place in the morning. The workers also had the opportunity to share news. Workers volunteered to

share news and each worker had an opportunity to communicate something to the rest of the group.

The aim of the life skills session was to promote social and personal presentation at work, independence in personal maintenance activities and coping skills. Topics discussed included how to greet a person (no hugs), traffic rules and self-care activities. The group started with an exercise session. Allen (1985: 237) recommends placing only four workers with one supervisor for the exercise group. This was not realistic as the supervisor with an assistant had to manage the group to 20 workers. This problem was overcome by incorporating occupational therapy students into the programme and allowing the higher functioning workers within that group to assist the supervisor. Each student took responsibility for seven workers and the supervisor for six workers. This lessened the responsibility carried by the supervisor.

Allen (1985: 238) recommends that the life skills group should take place every day, with fewer than 10 workers in the group. Life skills were scheduled for every day at the same time. The occupational therapy students, assisted by the supervisor, presented the sessions. When the students were not in the area, the supervisor had to present the sessions with the help of an assistant.

The workers were asked to bring their own face cloths, soap, toothbrushes and toothpaste, and combs/brushes to the meeting. These items were kept in the area as the workers are not able to remember to bring the items along every day.

Workers were divided into work groups for the preparation of tea. Every group had a chance to prepare for tea. Preparations included: taking orders for coffee or tea, putting out mugs, setting the table, making tea/coffee, serving the tea/coffee and cleaning the area afterwards. This took place before tea time and lunch time.

Contract work was incorporated to promote the work abilities of the workers and to prevent the workers from feeling patronised. Workers functioning on an ACL 3 are not concerned with the end product, though. This is a very important factor to consider when choosing the appropriate work task. Work tasks need to be simple (one- to three-step) activities that are repetitive. During the process of doing a task, the supervisor has to sequence the worker through the required steps. Work tasks included tearing of paper for recycling, and sorting and tearing cones. The contract work was the basis of

the achievement of skills. The worker had the opportunity to master the skill learned in the handwork activities during contract work time. According to Jacobs (1985: 54), this engages the workers in interacting with the environment with an emphasis on performance using an external standard of excellence and taking risks during participation in work-related activities.

The music group was used for the expression of emotion. The workers enjoyed listening and dancing to music. Musical instruments that were made during handwork activities were used to form a musical band in the area. The team co-operation that was achieved with the group activity was remarkable.

The workers were divided into small working co-operatives during handwork and garden activities. Activities were clustered according to the interest and ability of the workers. Each worker therefore had the opportunity to participate in activities of their choice and interest. The handwork and garden activities were utilised for acquiring new skills and workers had the opportunity to practise the new skill in an effort to achieve mastery. Garden activities included picking up of leaves and paper, preparing a vegetable garden and planting of vegetables. The handwork activities included needle work, paper maché, and paper making. These activities were very challenging to the supervisor as she had to plan the activities and do the preparation. Occupational therapy students were involved to analyse the activities, make adaptations and match the worker with the activity. The occupational therapy students also assisted in teaching new activities to the workers.

During the game time, when basic table games were played, the workers had the opportunity to learn about objects, their own capabilities and limitations. The workers' motivation and interest in objects were stimulated.

The activity programme was implemented in February 2001. A supervisor who was responsible for the implementation of the structured activity programme was appointed to the occupational group. The researcher met with the supervisor once a week to assist with the implementation of the programme. An assistant was appointed to the supervisor to assist with the management of the occupational group.

A fourth-year occupational therapy student commenced the presentation of the life skills group in February 2001. This provided training for the supervisor and assistant. Four

occupational therapy students presented the life skills during 2001, with the supervisor continuing with the life skills programme when the students were not in the area.

From the beginning of 2002, two third-year occupational therapy students have been placed with the occupational group. The fourth-year students were withdrawn from the area as an occupational therapist had also been appointed. The third-year students have been working under close supervision of the occupational therapist in the area. The students are placed in the area for a four-, six- and seven-week affiliation, three times per year. The two students, together with the supervisor and assistant, have been responsible for the management of the occupational group.

The researcher has had no control over the consistent execution of the programme by the supervisor. The supervisor had to adapt the programme due to contract work not always being available. The structured activity programme acted as a framework as to how the supervisor could structure the day. The supervisor had to adhere to the times and activities on the structured activity programme where possible.

After 18 months a post-test using the ACLS was done to reassess whether there was a change in the cognitive level of functioning of the workers in the occupational group.

3.4.3 Post-test

An assistant researcher assessed all the workers (n=20) in the occupational group with the ACLS. The group was assessed in one day as it took an average of five minutes per worker. The assistant researcher was able to do the assessment over a shorter time as most of the workers were on ACL 3. This meant that the workers were only able to perform the first stitch of the test.

3.5 Bias in the study

Bias in the study will be discussed according to the classification developed by Sackett (1979).

3.5.1 Reading up on the field

- One-sided reference – many studies on the ACLS have focused on its validity and reliability as a measurement tool and little attention has been given to the

use of it in practice. Kielhofner (1992) provided the only reference that gave a critical analysis of the FIPM.

3.5.2 Selecting the study sample

- Wrong sample size – the study sample was too small to reach any significant conclusion. The researcher will not be able to generalise the results.
- Missing clinical data – the biographical information of some of the workers was not fully described in their files. The researcher was not allowed to make contact with the family. Information had to be obtained from the supervisor and manager of the workshop as needed

3.5.3 Executing the study

- Contamination – some of the workers attended life skills groups that were presented by volunteer workers and the social worker. The researcher had no control over who attended, when they attend and the frequency of attendance or the content of the programme presented.
- Withdrawal – two of the workers were absent on the day of the post-test.
- Compliance – due to the nature of their diagnoses, compliance in the groups was not always consistent. The supervisor assisted by the student, presented the programme. There was no control regarding the consistent execution of the programme, as the workshop environment is very dynamic and many activities take place in-between.
- Therapeutic personality – the post-test was done “blind” to prevent the researcher from focussing on positive results. The researcher appointed an assistant to do the post-testing. Ten people from the workshop were selected randomly to increase the inter-rater reliability. The researcher tested the 10 workers and compared these scores with the assistant researcher. Outcomes of this to be discussed in Chapter 5.

3.5.4 Outcomes measure

- Underlying cause – due to the limited information in the area files, other factors, e.g. presence of psychiatric illness, could not be obtained from files to determine

any other confounding factors that could have influenced the change in the scores.

3.5.5 Analysing the data

- Post-hoc significance – decision levels for the acceptance of the hypothesis were stated before the data was examined.

3.6 Ethics

The study was approved by Research Committee C of the University of Stellenbosch, Faculty of Health Sciences. Permission of the Director of the organisation was obtained to perform the research.

The Occupational Therapy Code of Ethics of the Occupational Therapy Association of South Africa (OTASA) (n.d.) was used as a guide in determining the ethical behaviour of the researcher. The principle of beneficence was applied by maintaining the anonymity of the participating organisation and the workers. The workers were coded by a number system. The research assistant was skilled in using the ACLS and had knowledge of applying research principles.

The principle of autonomy was applied by allowing the workers the right to refuse participation. The participating organisation was informed regarding the research process.

The principle of veracity was applied by making all raw data available to the participating organisation. A copy of the assignment will be handed to the participating organisation.

The participating organisation gave consent for the study to be executed. The participating organisation obtained consent from the family of the workers.

3.7 Conclusion

A pre- and a post-test were conducted on the occupational group in a protective workshop in the Western Cape. The ACLS was used as the measuring instrument. The FIPM was used as a frame of reference for the development of the structured activity programme for the occupational group as it gives clear guidelines in terms of activity requirements, types of activities and the structuring of the environment.

The IQ of workers is usually the only record of the workers' intellectual impairment at many protective workshops for persons with intellectual impairment. Many of the workers do not even have that information on file. In many instances, IQ scoring was done while the worker was still at school, therefore giving an indication of the rate of cognitive development at that particular time. The AAMR and Grover classification systems as discussed in Chapter 2 are supported by the researcher as these systems focus on function. This supported the researcher in deciding on using the ACLS as a measurement tool and the FIPM as a frame of reference. The results of the ACLS can be used to provide environmental compensation for people with severe cognitive or mental disorders (Reed & Sanderson, 1999: 257).

The structured activity programme was implemented and after one year and six months a post- test was done on the workers in the occupational group.

An overview of the study method, study sample and data gathering was given in this chapter and a thorough description of the implemented programme was provided.

The statistical analysis of the results will be given and discussed in Chapter 4.

CHAPTER 4

PRE-TEST AND POST-TEST RESULTS

4.1 Introduction

The cognitive functioning of all the workers in a protective workshop was assessed by means of the ACLS. After the assessment of their cognitive functioning level, all the workers were divided into groups (work areas based on their ACL), as suggested by the workshop manager and the request of the parents, as well as the need of the workers. A structured activity programme was developed by the researcher and implemented in the occupational group by a supervisor, assistant and occupational therapy students.

The following hypothesis was formulated:

H0 – There is no change in the level of cognitive function of the workers in the occupational group after participation in a structured activity programme.

H1 – There is a change in the level of cognitive function of the workers in the occupational group after participation in a structured activity programme.

Only the workers who worked in the occupational group were assessed in the post-testing after 18 months and this group's pre- and post-test results of the ACLS were compared.

The results of the study were analysed with the assistance of a statistician. The Repeated Measures Analysis of Variance (R-ANOVA) test was used to analyse the data. This test was used as the pre- and post-test was done on the same group of workers. The R-ANOVA in this case is equivalent to a paired t-test for larger samples. When using the R-ANOVA certain assumptions are being made, e.g. the underlying distribution of data is a normal distribution. The normal distribution was checked by looking at the probability plots of medication, gender and age of the study population. A 5% significance level was used as guideline for determining significant differences.

The results of the study will be given in this chapter.

4.2 Pre-test results

The results of the pre-test were analysed by using descriptive statistics.

The workers (n=108) of the workshop scored between an ACL 3.0 and 5.8 on the ACLS.

Refer to Figure 4.1 for the distribution of cognitive levels within the protective workshop.

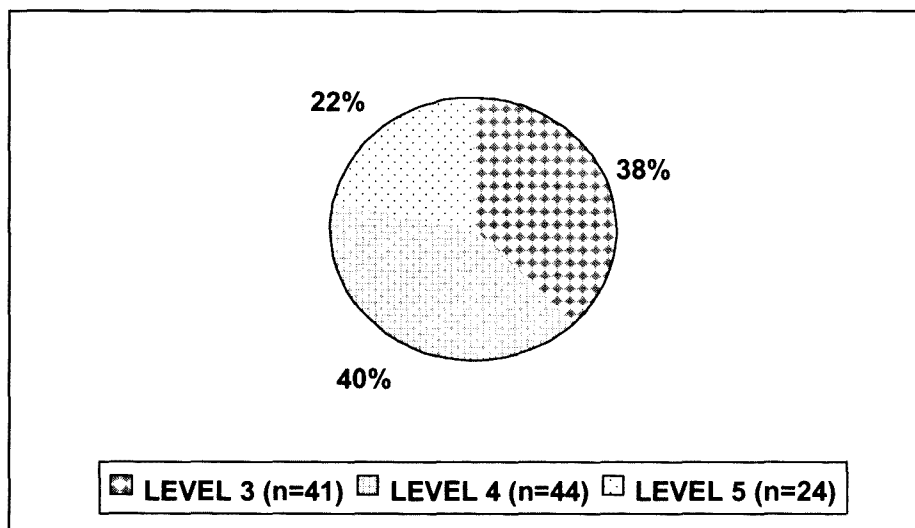


Figure 4.1: The distribution of cognitive levels of functioning of all workers within the protective workshop

Of the 108 workers, 41 workers (38%) scored an ACL 3. Only 23 (56%) of the 41 workers were placed in the occupational group. The protective workshop manager selected those workers whom she felt would be best suited for the occupational group based on the ACL, by request of the parents and the workers and those that she felt needed further treatment regarding their work ability before placement in the other areas of the workshop. The other 18 (44%) workers were able to do more complex repetitive tasks and were placed in the other areas of the workshop.

The distribution of the ACL scores of the workers in the occupational group is presented in Table 4.1.

Table 4.1: Pre-test distribution of cognitive levels of workers in the occupational group.

ACL	3.0	3.2	3.4	3.6	3.8	4.0
NUMBER OF WORKERS	0	15	4	2	2	1

Most of the workers (62,5%) scored an ACL 3,2 (refer to Table 4.1). The one worker with an ACL 4 was placed in the occupational group at the request of the worker's parents. This worker was not included in the study.

4.3 Post-test results

The post-test took place 18 months after the implementation of the structured activity programme. Only 20 workers of the 24 workers in the occupational group were included in the study as two workers were absent on the day of the post-testing and two workers had left the workshop.

The distribution of the ACL scores of the workers in the occupational group is presented in Table 4.2.

Table 4.2: Post-test distribution of cognitive levels of workers in the occupational group

ACL	3.0	3.2	3.4	3.6	3.8	5.2
AMOUNT OF WORKERS	2	10	2	2	3	1

Most of the workers in the occupational group (50%) scored an ACL 3.2. Two of the workers regressed to an ACL 3.0. One of the workers scored an ACL 5.2 and one more worker scored an ACL 3.8.

Pre- and post-test results of the workers in the occupational group were compared.

Refer to Figure 4.2 for a diagrammatic representation of the results.

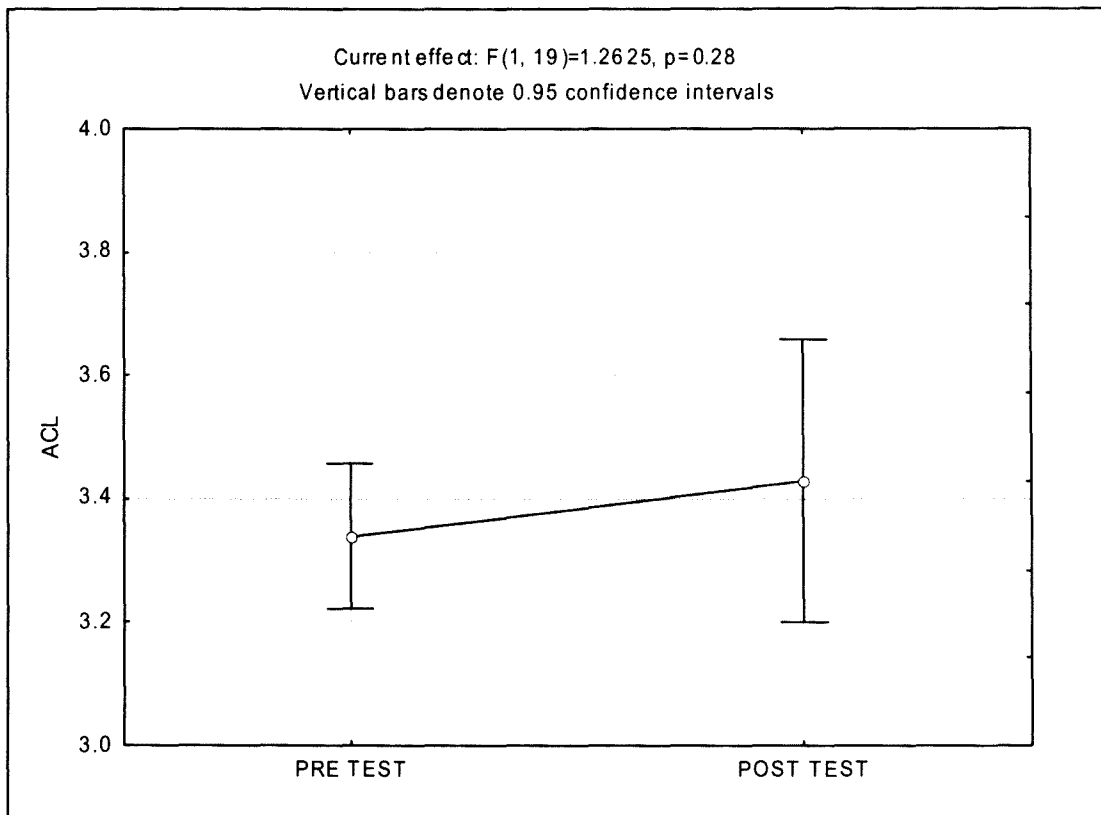


Figure 4.2: Pre- and post-test results of occupational group

The average values of the pre- and post-tests were determined. The average of the pre-test was 3.34 and the post-test was 3.43. The p-value of 0.28 indicated no statistically significant difference in the cognitive functioning levels of the workers in the occupational group after implementation of the structured activity programme. Possible reasons are discussed in Chapter 5.

Results were further analysed to assess whether there was a significant statistical difference in the cognitive functioning levels of the workers who used and those who did not use medication, and also between the male and female workers. No significant statistical differences were found. Refer to Table 4.3 for a summary of the results.

Table 4.3: Summary of results regarding gender and medication use

SCENARIO NUMBER	EFFECT	P-VALUE
1	Gender	0.65
2	Medication	0.69
3	Test (pre – post)	0.37
4	Test * gender interaction	0.37
5	Test * medication interaction	0.51

In Table 4.3, the effect refers to the different test scenarios that were performed. The averages were calculated and the p-values indicated that there was no significant statistical difference between the different effects.

1. The gender effect was determined by firstly calculating the sum of the pre- and post-test results for the different genders and then comparing the averages.
2. The medication effect was determined by first calculating the sum of the pre- and post-test results for the clients who used medication and those who did not use medication and then comparing the averages.
3. The test effect was determined by comparing the averages of the pre- and post-tests.
4. The test * gender interaction effect was determined by comparing the difference in the average of ACL levels of the different genders between pre-test and post-test.
5. The test * medication interaction effect was determined by comparing the difference in the average of ACL levels of the workers who used medication and those workers who did not use medication between the pre-test and post-test.

Figure 4.3 presents the results obtained after further analysis to determine whether the age of the workers had any influence on the effect of the post-test score. This was done by correlating age with the differences in pre- to post-test scores (post-score – pre-score). Correlation between the pre- and post-test results and age indicated no significant correlation between the age and the ACL score ($r=-0.29$, $p=0.21$). The

extreme value of 1.4 was considered to be extreme and was therefore excluded from the data analysis.

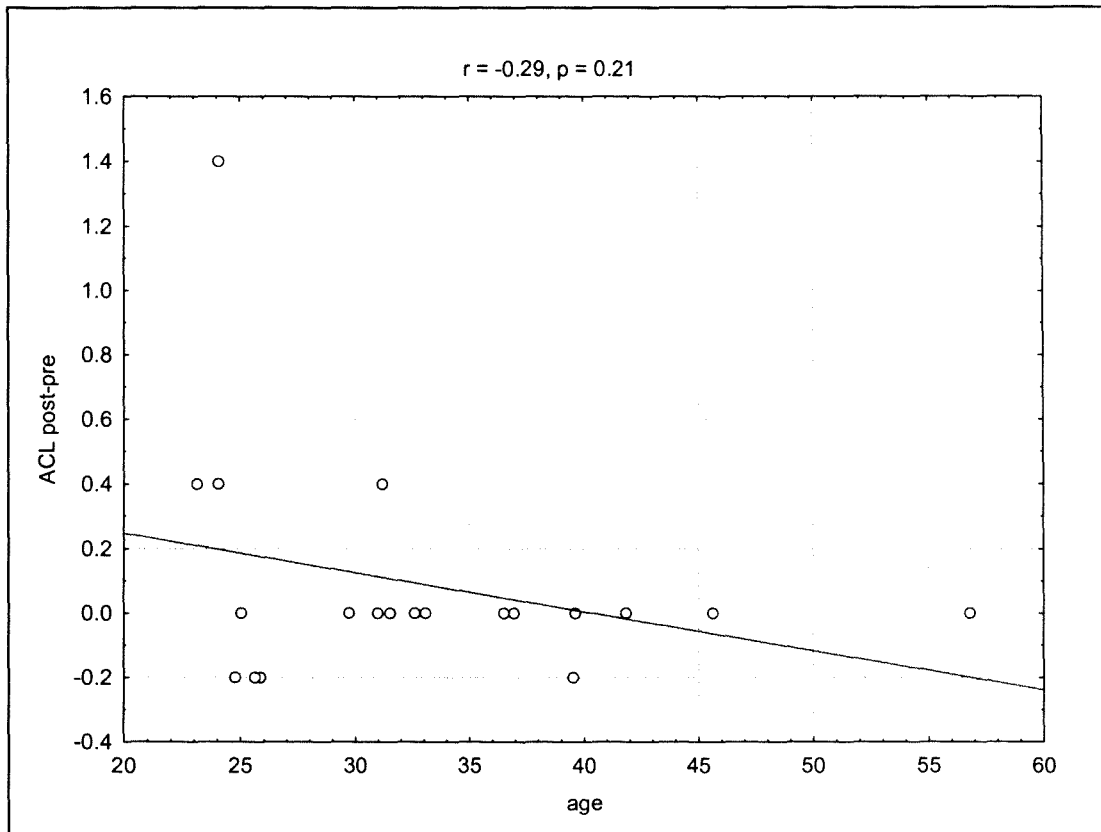


Figure 4.3: Effect of age on the pre-test and post-test results

4.4 Conclusion

The null hypothesis was accepted as $p=0.28$. There was no statistically significant difference in the cognitive functioning levels of the workers in the occupational group after implementation of the structured activity programme for a period of 18 months.

Among the workers participating in the protective workshop, 38% scored an ACL 3. This has huge implications for the protective workshop: If 38% of workers are not able to meet the production requirements of the protective workshop and as the workshops' income is dependent on the productivity of the workers, the workshop will not be able to become economically sustainable.

The reasons and implications of the results will be discussed in Chapter 5 with recommendations regarding future research within the structured activity programme.

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

5.1 Introduction

According to Sturney (2002: 491), the development of appropriate coping, communication, social, vocational and other skills is needed to prevent most psychiatric and behavioural disorders. Sturney emphasises the importance of teaching these skills to persons with intellectual impairment.

The FIPM was used to develop a structured activity programme for persons with intellectual impairment who work in a protective workshop. The model provides detailed information regarding the functioning of a person, type of activities that can be used in treatment and environmental compensation that needs to occur to promote optimal functioning within the limitations of the client. The ACL level of the workers in this study was used as a criterion for the inclusion of activities into the programme. After one year and six months the workers' ACL was reassessed.

In this chapter, the researcher will interpret results as recorded in Chapter 4 and make recommendations regarding future management of the group and research activities.

5.2 Discussion

5.2.1 Study sample

The 20 workers in the occupational group who met the criteria for inclusion were included in the study. This study sample was very small ($n=20$). Therefore the results of this study cannot be generalised.

This study needs to be implemented at other protective workshops to enlarge the study sample to be able to generalise results. This study was limited to only one protective workshop for people with intellectual impairment.

Limited biographical and medical information was available in the workers' files. Information regarding the cause of the intellectual impairment of the workers cannot be provided as the researcher had no medical information other than whether they used medication or not. The researcher is of the opinion that the cause of intellectual

impairment did not have an effect on the outcome of the study. All the workers were intellectually impaired and the ACL score gave an indication of the worker's cognitive functioning.

It was evident from the literature study that medication does have an affect on a person's cognition and therefore on the functioning of the worker. The researcher cannot report on the medication in terms of indication, dosage and side-effects, therefore the researcher cannot discuss the effect of these variables on the results.

It is recommended that the organisation keep a sound record of all the workers. The following information needs to be on record:

- Full name of worker
- Identity number
- Date of admission
- Medical information such as diagnosis, medication, precautionary measures and any relevant medical history
- School/education information
- Work history/previous employment at protective workshop(s)
- Areas in the workshop where the client has worked and reason(s) for transfer to another section in the workshop. This is necessary so the person in charge (e.g. occupational therapist) can have knowledge of the worker's work history

5.2.2 Pre-test

The pre-test results indicated that 38% of the workers in the workshop had an ACL 3 score. This has serious implications for the workshop as workers who function on an ACL 3 are not concerned with the desired end product. They do not complete tasks correctly as they are unable to identify and correct mistakes, and this has an effect on the quality of the end product and leads to poor production. A desired end product is the expected outcome in any work setting. An inadequate approach from the worker leads to lower production in terms of quality and quantity in the workshop and therefore results in a decrease in income. Behaviour problems amongst workers also develop when the lower functioning workers are seen as "lazy" by the other workers because

they do not sequence themselves through the steps of an activity, but need assistance to go from the one step of the activity to the next.

Workers were grouped according to the ACL score in the protective workshop. Many of the workers and supervisors resisted the redistribution of workers and staff in the workshop. The researcher believes that this could have been due to the fact that the workers were not able to easily adapt to change due to their intellectual impairment and the staff was unsure regarding the changes that took place in the workshop.

The researcher recommends that the ACLS be used as part of the initial assessment to assist with the correct placement of the worker. A person with intellectual impairment does not easily adapt to change. This will also help to make the transition and adaptation easier for the worker. The use of the ACLS as an initial assessment will ensure that the worker does not need to be move from one area of placement to the next.

5.2.3 Structured activity programme

An activity programme for the occupational group was developed and implemented with the FIPM as frame of reference after using the ACLS as a measuring tool.

The programme will be discussed in accordance to the under-mentioned sections.

5.2.3.1 Staffing

Allen (1985: 238) recommends that not more than 10 workers be included per life skills group. This recommendation was not realistic, as the protective workshop could only afford to employ one supervisor to a group due to budget constraints. When a group is made up of more than 10 members, the degree of control that the supervisor has over the group is affected. It is recommended that an assistant be made available to assist the supervisor. One of the higher functioning workers (ACL 5 and higher) could be put in this position. This could have an impact on the production of the protective workshop as the worker would not form part of the production group of the workshop. But the arrangement could also be seen in terms of empowerment of the worker, as the worker would have a greater responsibility. An increase in salary could be given, thereby supporting the economic empowerment framework as stated by the Department of

Social Services and Poverty Alleviation (*Operational Manual for Protective Workshops*, 2001).

The motivation level of the supervisor has an influence on the sustainability of the programme. If the supervisor is not motivated, the programme will not be implemented as recommended. A recommendation is put forward that a support system should be in place for the supervisor as it can be emotionally draining to take responsibility for this programme and the workers. Initial contact sessions with the supervisor provided the necessary support. Weekly follow-ups took place until an occupational therapist was appointed.

It is furthermore recommended that the supervisor should receive training as an occupational therapy assistant as the supervisor has to work in close collaboration with the occupational therapist. This would assist the occupational therapist during times when the occupational therapy students are not in the work area and ensure optimal continuation of the programme.

The occupational therapy students provided support for the supervisor when they worked in the area as they took co-responsibility for the programme. The students provided training to the supervisor in terms of handling the clients, presenting the groups sessions, analysing and adapting the activities to ensure fit between the activity and the worker.

5.2.3.2 Programme content

The content of the programme focused on life skills, basic occupational skills, work abilities, social skills and personal maintenance activities. The basis of the content for the programme was the ACL score of the workers based on the FIPM. The researcher is of the opinion that there was a good balance between the different activities.

Workers become tired towards the end of the day, therefore it is recommended that contract work be done earlier in the day. Fatigue could have a further negative impact on the already short concentration span of intellectually impaired workers.

Table 5.1 Adapted occupational group programme

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
08:15-08:30	Register	Register	Register	Register	Register
08:30-09:00	Climate Meeting	Climate Meeting	Climate Meeting	Climate Meeting	Climate Meeting
09:00-09:30	Life Skills	Life Skills	Life Skills	Life Skills	Life Skills
09:30-10:00	Preparing Tea	Preparing Tea	Preparing Tea	Preparing Tea	Preparing Tea
10:00-10:15	Tea Time	Tea Time	Tea Time	Tea Time	Tea Time
10:15-12:15	Contract Work	Contract Work	Contract Work	Contract Work	Contract Work
12:15-12:45	Music Group	Gardening	Music Group	Music Group	Gardening
12:45-13:00	Preparing Tea	Preparing Tea	Preparing Tea	Preparing Tea	Preparing Tea
13:00-13:30	Lunch	Lunch	Lunch	Lunch	Lunch
13:30-15:30	Handwork Activities and Cleaning	Handwork Activities	Handwork Activities and Cleaning	Handwork Activities	Games and Cleaning

Providing meaningful occupation reduces the effect of deinstitutionalisation. The structured activity programme is aimed at providing meaningful occupation to the workers. A study done by Parsons, Reid, Reynolds and Bumgarner (1990) (in Lee *et al.*, 2001: 334) found that “on-task behaviour for vocational activity increases when individuals are: allowed to choose, and presumably select a more preferred vocational activity, as opposed to being assigned to work on a non-preferred task; or assigned a preferred vocational task”. It is important for any person who has the ability to do an activity to be allowed choice in doing the activity. According to Lee *et al.*, however, doing preferred tasks does not necessarily increase productivity.

5.2.3.3 Implementation of programme

Better control has been achieved since the appointment of the occupational therapist in 2002, as the supervisor has to report directly to the occupational therapist.

The initial and ongoing support provided to the supervisor is vital for the sustainable execution of the programme and for making the supervisor co-owner of the programme. During this time the supervisor is able to air the fears, frustrations and joys experienced as a result of the programme.

Productivity is very important for sustainable development in the protective workshop. The insufficient productivity of the workers of the occupational group is further complicated by their level of motivation and physical limitations. It is therefore important for the occupational therapist of the protective workshop to apply principles of motion

economy so that the most efficient method of completing an activity can be identified. The structure of the group needs to be evaluated to ensure optimal application of the principles of motion economy. The size of the room has to be reevaluated as it is not possible to place the tables optimally in the area to accommodate the number of workers. The layout of the tables needs to be such that the workers have enough space to move between tables and also to move freely in the room. It is recommended that, if possible, the workers work in groups of four to make control easier and for the supervisor to have access to the workers when assistance is needed. This could not be realised in the study as the room was small and had to be arranged in such a way that all the workers could fit into the section.

The room should meet the following requirements:

- Adequate space for moving between the tables and in the room
- Proximity to a toilet
- Basin with cold and hot water
- Cupboards to store materials and equipment
- Cupboards to store the personal belongings of the workers
- Tables need to be covered with plastic table cloths to make cleaning easier

The researcher also recommends that the occupational group be further divided into two groups:

Group A – Maintenance group

Group B – Preparation group

The maintenance group should comprise those workers who will never be able to move out of the occupational group and who perform activities with very low production levels. The preparation group would comprise workers who are identified as being able to perform productive activities and who could be moved to another placement in the workshop when they met the inter-phase criteria (Jacobs, 1985: 253). This would ensure continued development of the worker role and prevent stagnation of workers who are able to develop in the occupational activity group. It would also ensure alignment with the transformation process as outlined in the *Operational Manual for*

Protective Workshops (Department of Social Services: March 2001). Refer to Table 5.2 for possible assessment criteria for the group. Aspects of this table were adapted by the students from Jacobs (1985: 253).

Table 5.2 Interphase criteria

WORK ABILITY CATEGORIES	LEVEL 3	INTERPHASE
PERSONAL PRESENTATION:		
Attendance	Staff dependent	Staff dependent
Appearance	Must be dressed for work	Ability to remain appropriately dressed with staff supervision
SOCIAL PRESENTATION:		
Initiative	Not applicable as they are unable to take initiative.	Not applicable as they are unable to take initiative.
WORK COMPETENCIES:		
Task Completion	Ability to perform one sub-unit of a task for immediate effective reinforcer	Ability to complete one simple task for immediate effective reinforcer
	Ability to recognise a change in environment; ability to discriminate between two functional tabletop objects, e.g. cup and plate	Ability to discriminate between basic 3-dimensional shapes. Ability to complete a unit of a task
Following Instructions	Ability to respond to one-step instructions: "Sit down. Time to work."	Ability to respond to additional one- and two-step simple-task, specific instructions
Handling of Objects	Ability to manipulate meaningful stimuli	Ability to manipulate objects in relation to self; in front of, behind self; e.g. to throw a ball
	Ability to recognise and locate environmental stimuli	Ability to locate and recognise environmental stimuli
WORK ENDURANCE:		
Work Tolerance	Ability to discriminate between home and work environment as measured by going to and from work	Ability to remain in the work environment for up to one hour a day
Staying on the job – sitting tolerance	Ability to sit in designated seat for immediate effective reinforcer	Ability to sit in designated seat up to 45 min. with intermittent effective reinforcer
Flexibility	Inapplicable	Inapplicable
Physical Strength Endurance Dexterity	Ability to reach for and grab large tabletop objects with either hand	Ability to manipulate large table-top objects: Ring on ring stack; ability to repeat fine motor skills necessary to perform simple table-top activities for up to 45 min.

Jacobs (1985) recommends that the worker be moved to another placement in the workshop if he/she:

- is able to attend work daily.
- is independent with regard to basic self-maintenance skills.
- is able to make basic needs known through signs, gestures or words.
- is able to understand three-step tasks either verbally, visually, manually or in combination.
- has sitting tolerance of 50 minutes.
- is able to work independently for approximately five minutes.
- is able to work at least two hours per day per week.
- is able to participate in small, structured social groups.

The above arrangement will ensure continual development of the workers and optimal fit between the work activities and the worker.

The above principles were not implemented in the programme as the staffing to implement such a strategy was inadequate. It is recommended that the workshop start looking at a transitional programme that could assist with this phase.

The researcher recommends that the guidelines used to set up the programme be used as minimum standards for an occupational group as there are no set minimum standards for such a group.

5.2.4 Post-test

The post-test indicated that there was no significant change in the cognitive levels of the workers in the occupational group after implementation of a structured activity programme. This could be the result of a too small study sample. Although the change in the ACL was not significant, it was sufficient to indicate that some learning did occur on an ACL 3, as one of the workers scored an ACL 5.2 and another worker scored an ACL 3.8. The result of the study needs to be verified by implementing the structure at other workshops, thereby to increase the size of the study sample. This present result

supports the recommendation made by Kielhofner (1992: 117) that further research needs to be done to demonstrate whether learning can take place in persons with permanent cognitive impairment.

Two of the workers scored a lower ACL score than in the pre-test. No objective reason can be given for the lowering in the ACL score. The file did not reveal any possibility of epileptic seizures on the day before testing or any disruption in the lives of the relevant workers during the previous evening. It could be that these two workers did not relate to the research assistant as they found it difficult to relate to new people and did not trust the research assistant.

The study demonstrated that gender; age and medication use did not have an effect on the pre- and post-testing of the ACL. According to Wheatley (Pedretti and Early, 2001: 459) the ageing process is characterised by a decline in working memory, face recognition, speed of information processing and spatial recall. This is further complicated by the decline in visual and auditory skills. These cognitive components are characteristic of a person functioning on an ACL 3. Persons with intellectual impairment will experience the same decline as the normal ageing population. Walsh (2002: 509) stated that the "... interaction between the biological, psychological and social aspects of ageing remains the most important factor in the functional outcome of an individual with intellectual impairment". Other factors such as illness, environmental factors or life circumstances also have an impact on the ageing process for persons with intellectual impairment.

Fifty per cent of the workers in the occupational group were on medication. Allen (Kielhofner, 1992: 111) has argued that medication has an effect on the ACL of a person. Sturney (2002: 491) stated that there is a lack of empirically based trials for the use of psychotropic medication for challenging behaviours. According to Ono (1998: 128), persons with severe/profound intellectual impairment are prescribed higher dosages of anti-psychotics than those with mild/moderate intellectual impairment. Therefore the workers could also be classified under the umbrella of persons with psychosocial dysfunction due to challenging behaviour being present and the use of medication (Sturney, 2002: 490).

5.3 Recommendations for further research

The researcher recommends that this study be implemented at other protective workshops to increase the study sample and be able to generalise the results.

The researcher also recommends that a single case study should be performed to emphasise the qualitative changes in the worker. The current study only focused on the ACL score of the worker. No changes regarding the worker's work habits, work competencies and work motivation could be shown. Such information would be valuable in noting the changes in the worker and the effect of the programme on the worker's work abilities.

The researcher has identified a research opportunity to identify the use of the FIPM in the Western Cape or in South Africa in Chapter 2. Such a study could also be used to determine how local results correlate with the study done in Australia (Hayes & Keller, 1999).

5.4 Conclusion

Work is an important aspect of a person's daily activities. Work gives meaning to everyday functioning. It is the primary source of a person's day plan. Work provides persons with intellectual impairment with a sense of belonging and active participation in meaningful occupations.

When an occupational therapist develops an activity programme for workers with intellectual impairment, it is important to allow the person a choice of activities and also to train the person to perform the activity of choice. The FIPM can be used to assist the occupational therapist in developing an activity programme for a group of persons with intellectual impairment. The ACLS can be used as an effective screening tool for placement of workers within the various areas in a protective workshop.

The person with intellectual impairment has a right to be economically active and a right to a good quality of life. The opportunity has to be created for the person with intellectual impairment to perform productive work and engage in meaningful occupations within the scope of his or her capabilities.

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