

INDUSTRIAL LITERACY AND NUMERACY: WORKPLACE ASSESSMENT OF PEOPLE WHO ARE DEAF OR HEARING IMPAIRED.

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ABSTRACT

In response to the need to ascertain the appropriate placement of people who are deaf or hearing impaired within the workplace, a Workplace Assessment Program was developed. In this paper, reference to case studies illustrates the application of the Workplace Assessment Program, in particular the literacy and numeracy skills assessment component of the program.

Literacy and numeracy is assessed using both informal measures and a formal standardised test measure; "The Adult Basic Learning Examination (ABLE)". The results of the literacy and numeracy assessment are reported using the "Adult Literacy and Numeracy (ALAN) Competency Scales".

Overall, through assessment and discussion of vocational aptitudes, interests and values, the Workplace Assessment Program (WAP) facilitates the deaf/hearing impaired person's vocational decision-making process in order to achieve optimal vocational placement.

THE WORKPLACE ASSESSMENT PROGRAM - WHY?

Although deaf* people may have been given assistance to obtain employment, they are not always placed in the most appropriate position. On other occasions a deaf person may be placed appropriately initially but then may not have the opportunity for promotion and may find themselves in the same position for many years. Often the full potential of deaf workers is not realised which is unfavourable for both the deaf person and the employer alike. The WAP was originally designed to assess employed deaf people who needed to be relocated within an organisation. There are other applications for this program however, such as

vocational guidance for unemployed deaf people.

*For the purpose of this paper, "deaf" shall be used to refer to "deaf and hearing impaired".

The actual difference between deaf and hearing impaired people involves primarily two factors: (i) How does the person communicate? this is largely determined by degree of hearing loss - generally hearing impaired people use their hearing assisted by amplification in order to communicate whereas deaf people, who usually have a greater hearing loss than hearing impaired people, rely on their vision either lipreading, signing or writing, and (ii) Who do they identify with? - generally hearing impaired people identify with hearing people, whilst deaf people identify with other deaf people and belong to the Deaf Community, seeing themselves as normal deaf people rather than impaired hearing people.

The objectives of the Workplace Assessment Program are:

*To provide a profile of the deaf person from which the most appropriate career path can be generated.

*To facilitate the deaf person's vocational decision-making process by increasing their awareness of their own potential and the various jobs they would enjoy and be capable of doing.

*To facilitate the implementation of the career path determined, to result in job satisfaction and optimal vocational achievement.

*To assist employers of deaf people by enhancing the job satisfaction and thereby the work performance of deaf workers.

The WAP has been designed specifically for use with deaf people. The tests used are selected because:

*the test is suited to a deaf population (ie: the directions and the responses required from the deaf person are straightforward and variables that would unfavourably bias the results of deaf people are eliminated, for example: no

tests that rely on the ability to hear or speak are used; tests that are visual and non-verbal are used wherever possible).

*the test is suited to an adult population.

*the test is suited to an Australian population (minor modifications are made to some tests eg: "gas" is changed to "petrol").

*the test is suited to the purpose of the assessment.

The emphasis in the WAP is to look at the strengths and weaknesses of a deaf individual and align these with an appropriate job. Therefore, wherever standardised test measures, which are normed on the general (hearing) population, are used, the test results will mainly serve as a guide to the individual's abilities rather than to compare them to the population in general.

For the WAP to be successful, it is essential that the "evaluator" be knowledgeable in the area of deafness, with fluency in sign language to enable effective communication with the deaf person. This gives the evaluator first hand access to the subtleties communicated by the deaf person which could be overlooked by an evaluator who is inexperienced with assessing deaf people and reliant on a sign language interpreter.

THE WORKPLACE ASSESSMENT PROGRAM - WHAT IS IT?

The WAP is adapted from Watson's "Model for Vocational Evaluation of Severely Disabled Deaf Persons" [Watson, 1976:22].

The WAP involves three stages:

- (i) Determining the "workplace profile" of the deaf individual.
- (ii) Determining an appropriate career path for the deaf individual.
- (iii) Assisting with the implementation of the chosen career path.

There are a number of steps involved in each of these stages.

- (i) Determining the "workplace profile" of the deaf individual.

Establishing a workplace profile involves: an evaluation interview (presentation, case history, educational background, work history, interests and values); skills assessment (general ability, literacy, numeracy); vocational interests and values assessment, and; the preparation of a report.

(ii) Determining an appropriate career path for the deaf individual.

In order to determine an appropriate career path based upon the recommendations of the report, the following steps are required:

*Discussion of the report with the deaf person to give them feedback about their assessment results and to ensure their agreement with the report's recommendations.

*Discussion of the report and its' recommendations with a Placement Officer who selects a range of between 3 - 10 jobs best suited to the deaf person, taking into consideration all aspects of their "workplace profile" and the availability of a placement.

*Discussion of viable placement options with the deaf person who selects their first preference.

*The deaf person is placed in the job of their choice for a one week trial period (or completes work samples of the job chosen) to confirm the suitability of the placement.

(iii) Assisting with the implementation of the chosen career path.

To implement the career path determined to be most suitable:

*Deafness Awareness Training (DAT) is presented to potential co-workers to educate them regarding effective communication with deaf people. The objectives of DAT and a DAT program outline is provided in Appendix A.

*A review of the placement is carried out after a period of 3 months.

The desired outcome of the program is optimal vocational placement. This in turn should optimise vocational achievement and create a WIN-WIN situation for both the deaf worker and the employer.

For the purpose of this symposium on "Industrial Literacy & Numeracy and Competency Based Assessment", I will focus on the literacy and numeracy

assessment component of the WAP.

THE LITERACY AND NUMERACY ASSESSMENT COMPONENT OF THE WAP.

Informal Literacy Assessment.

(i) Reading.

The literacy assessment commences informally during the evaluation interview when discussing interests and values. If reading is not mentioned as an interest, the deaf person is asked "Do you like reading?". This leads to discussion whereby the following questions are answered: "What do you read?", "What everyday activities do you use reading for?", "Do you read the newspaper?", "What newspapers do you read?", "What parts of the newspaper do you read?". These questions, and those asked when discussing writing and reading, are suggested as "useful questions to ask" when reporting on assessment using the Adult Literacy and Numeracy (ALAN) competency scales (Griffin, Hepenstall, Pollock & Forwood, 1992).

The deaf person is then presented with a summary of the ALAN Reading Competency Scale [see Appendix B(i)] and asked "Can you find your reading level on this scale?" Once they have identified their reading level they are asked "Why do you think you are level n and not level n+1?"

The deaf person is then presented with reading material [see Appendix B(ii)-(vi)] appropriate to the level they have self-assessed in order to confirm their self-assessment. This material has been selected because of its familiarity, that is, it is either deafness-related or appropriate to the particular work situation the deaf person is in.

(ii) Writing.

The deaf person's writing ability is assessed by asking "Do you like writing?", "In what situations do you need to write?", "Can you find your level of writing on this scale?" [the ALAN Writing Competency Scale, see Appendix C(i)] "Why do you

think you are level n and not level n+1?" "Could you please fill out this form" [see Appendix C(ii)]. The form used is relevant to the assessment situation and asks questions relating to the deaf person's current employment as well as their hopes and plans for future work.

Informal Numeracy Assessment.

As with the informal literacy assessment, the informal assessment of numeracy commences during the evaluation interview when the deaf person is asked, "Do you like mathematics?" followed by: "Do you need to do maths very often?", "In what situations do you do maths and what sort of maths do you do?", "Can you find your level on this maths scale?" [ALAN Quantitative Information Processing (QIP) Competency Scale, see Appendix D]. Further test items (15+24, 22-9, 21X7, 36-9) are then given to see if the deaf person's self-assessment is accurate.

Formal Reading and Numeracy Assessment.

A formal assessment of reading and numeracy skills is completed using the "SelectABLE" (Karlsen & Gardner, 1986). The SelectABLE contains 45 multiple-choice questions addressing both verbal (30 questions) and numerical (15 questions) concepts.

The SelectABLE is a screening device to be used in conjunction with the Adult Basic Learning Examination (ABLE). The ABLE consists of a battery of tests to measure the level of educational achievement among adults. It consists of three levels to accommodate meaningful segments of twelve years of schooling (Karlsen & Gardner, 1986):

Level 1: Adults who have completed primary education
(one to four years of formal education)

Level 2: Adults who have completed intermediate education

(five to eight years of formal education)

Level 3: Adults who have completed high school education
(a minimum of eight years formal education)

The SelectABLE is administered during the evaluation interview in order to determine which level of the ABLE (Level 1, 2 or 3) would be most appropriate for a given individual.

The ABLE was selected for formal reading and numeracy assessment because it is a test that consists of passages that contain meaningful adult content and focuses on the comprehension of the various types of material which adults are likely to encounter at work or in other everyday activities.

For the purposes of the WAP, only two of the subtests of the ABLE battery are administered: Reading Comprehension and Problem Solving. These particular subtests were chosen because they assess the application of reading and mathematics skills.

The combined results of the informal and formal literacy and numeracy assessments are reported using the ALAN Competency Scale descriptions.

THE APPLICATION OF THE WAP - CASE STUDIES.

This paper will look at two deaf people who have been assessed using the WAP. They shall be referred to as S1 and S2.

Background Information:

S1 and S2 are both females in their early 20's who left school having completed 10 years of education (School Certificate). They are presently both employed by a bank.

S1 prefers to communicate using a combination of signing, speech and lipreading. She is unable to use the telephone as she cannot hear what is said without the assistance of visual cues (ie: lipreading). She sees herself as a "normal deaf person" rather than as an "impaired hearing person". Her interests centre

around
sports and socialising with friends.

S2 prefers to communicate using a combination of speech, hearing (with the assistance of amplification) and lipreading. She has some signing skills. She sees herself as hearing impaired rather than deaf and identifies more with hearing people than with deaf people. She is able to communicate using a telephone if the sound is amplified. Her main interests are spending time with family, shopping and travelling.

Informal Literacy Assessment Results:

When asked; "Do you like reading?" the verbatim responses of S1 and S2 were as follows:

S1: "Yes, but it is very hard .. never heard words before .. need more learn read".*

S2: "So-so, .. some can't understand what the words .. never heard that before".*

* Note: The spoken and written English of S1 and S2 reflects an imperfect language model on which they are basing their language. Primarily this is because hearing loss often means that not all the speech sounds are heard, making speech comprehension and subsequently speech production very difficult. Further, the reliance upon speechreading (lipreading plus body language cues) to supplement auditory input is exhausting and ambiguous. Many distinctions among sounds are not visually observable; "in English only about 40% of the sounds are visible on the lips" Liben (1978). This restricts both vocabulary and knowledge. To speechread well requires a good understanding of the vocabulary and syntax of the language being spoken, but for deaf people, this information must be derived from impoverished visual information in the first place. To compound the situation even further, people tend to speak to deaf people (particularly deaf children) in ways that deprive them of normal linguistic interaction and inhibit their development of generative grammar. For example, there is often a preoccupation with

proper speech, so that discussions with deaf children commonly focus on their imitative ability rather than interactive communication skills (Clezy, 1979). Consequently the spoken and written language of deaf people is often delayed at all levels: vocabulary, syntax and appropriate use of the language. An additional influence on the structure of S1, and to an extent S2's, English is the influence of the grammar of Australian Sign Language (Auslan) which differs from the grammar of English.

When asked to complete a self-assessment on the ALAN Reading Scale:

S1: Concluded that she never takes risks when reading in order to guess the meaning of unfamiliar words and therefore would have to stop at Band B, having not developed the reading behaviours of Bands C - I.

S2: Concluded that she has developed the reading behaviour of Bands A - E, is still developing the reading behaviour patterns of Band F, and as yet does not demonstrate the reading behaviours described in Bands G - I.

When asked to explain a simple poster regarding the business hours of a bank

[see Appendix B(ii)], both S1 and S2 were able to do this literal comprehension

task. When asked to explain a more complicated poster from their workplace which has multilevel meanings concerning a Superannuation fund [see Appendix

B(iii)], a distinction between S1 and S2 is apparent. S1 gave a literal interpretation

that did not take into consideration that the signposts were referring to a superannuation fund. S2 provided an inferential interpretation. Their verbatim

responses were as follows:

S1: "NO ENTRY ... means can't go through there"

"pretend if there was a fire, you can't exit there (points to NO EXIT sign) ... if it said EXIT then you can out there".

S2: "NO ENTRY means no fees .. no entry fees with your first deposit ... NO EXIT means no charge for withdrawal".

When presented with an article of Band D difficulty on the ALAN Reading Scale

[see Appendix B(iv)], both S1 and S2 were able to find the main idea in

this short
and relatively simple passage.

When presented with an article of Band E difficulty on the ALAN Reading Scale [see Appendix B(v)] the verbatim responses of S1 and S2 when discussing the article was as follows:

S1:"not too bad - some not understand .. I don't know what said .. some never heard words before".

S2:"She trying to be an actress like Marlee Matlin .. she won an award".

S1's response indicates that this reading material is above her reading ability. S2's response is an accurate summary of the article and reflects S2's ability to identify the general idea of an article of Band E difficulty, discuss the story and call on her own experience to understand the text.

When presented with an article of Band F difficulty on the ALAN Reading Scale [see Appendix B(vi)], S2 was similarly able to identify the main idea and demonstrated the ability to re-read the text for detail. S1 was not given the Band F text as this was beyond her reading ability.

When questioned regarding more advanced reading skills, S2 reported that although she is able to skim read and read uncomplicated business letters and news items, she still needs to clarify with others when reading detailed or lengthy information (Band F). She has not yet developed an explicit understanding of the fact that different types of text have different styles and vocabulary and does not understand this concept (Band G). Although S2 was able to give an advanced interpretation of the "NO ENTRY / NO EXIT" poster, she was unable to recognise that other levels of interpretation were also possible (Band G) and that these levels may represent different levels of meaning (Band I).

At this stage it was estimated that S1 would be Band D on the Reading Scale and S2 would be Bands E - F.

Informal Writing Assessment:

When asked; "Do you like writing?", the verbatim responses were as follows:

S1:"I like writing but it is very hard, I need to learn more".

S2:"Yes, I have to write fax's, letters, memos, phone notes .."

S1 and S2 were asked to complete a simple form [see Appendix C(ii)].

Both S1 and S2 have established the writing behaviours of Band C and are still developing the writing behaviours of Bands D and E (S2 having developed more of these than S1). Neither S1 or S2 have developed the writing behaviours of Bands F - I.

Informal Numeracy Assessment:

When asked; "Do you like mathematics?" the responses were:

S1:"Yes .. but I really only use numbers for filing and checking account numbers. If I do maths it is mostly minus and sometimes plus"

S2:"Yes .. I do maths often ... cash amounts, withdrawals, deposits, calculating interest .. I did more maths when I worked in the branch"

When asked to complete a self-assessment on the ALAN QIP scale [see Appendix D] the responses were:

S1:Band D

S2: Bands E - G

Both S1 and S2 were able to successfully complete the addition, subtraction and multiplication test items [ie: $15 + 24$, $22 - 9$, 21×7], however neither were able to divide 36 by 9. This may be because they are now accustomed to using a calculator for calculating division sums and cannot remember the actual process involved.

Formal Reading and Numeracy Assessment:

S1 and S2 were administered the SelectABLE with results as shown in Table

1.

TABLE 1: SelectABLE Results

	Reading (/30) [% correct] [% correct]	Numeracy (/15) [% correct]	Total (/45)
S1	3 8 [10%] [17%]	5 [33%]	
S2	13 24 [43%] [53%]	11 [73%]	

The recommended ABLE Level assignments according to SelectABLE score are as follows: 0-19 = Level 1, 20-31 = Level 2, 32 - 45 = Level 3 (Karlsen & Gardner, 1986). This is based on the overall score, no distinction is made between reading and numeracy results.

Based on their total SelectABLE scores, S1 should be tested on ABLE Level 1 and S2 should be tested on ABLE Level 2.

Looking at the breakdown of the SelectABLE scores however, it is evident that S2 did considerably better with the numeracy questions (73% correct) than with the reading questions (43% correct). Based on this it would seem that S2 was legitimately Level 2 for numeracy but that her high numeracy score had inflated her overall score placing her in Level 2 for reading when she should be in Level 1. Based on this idea, S2 was administered the Level 1 Reading Comprehension test and, subsequently, the Level 2 Reading Comprehension test.

The results of S1 and S2 on the ABLE Reading Comprehension test are depicted in Table 2.

TABLE 2: ABLE Reading Comprehension Results.

	% CORRECT	SCALED SCORE
S1		
Level 1	45%	554
S2		
Level 1	73%	599
Level 2	67%	659

Note: Scaled scores are according to normative data from the "Combined Group" (N=856 for Level 1, N=908 for Level 2).

Table 2 indicates that S2 actually performed better on Level 2 (Scaled Score = 659) than on Level 1 (Scaled Score = 599). To determine how this could happen requires a closer look at the test items.

The test items in the ABLE Level 1 Reading Comprehension subtest questions are all multiple choice and are divided into three types: Signs (requiring the reading and comprehension of information presented on simple printed signs), Cloze questions (requiring the completion of sentences within short reading passages), and Paragraph Comprehension (requiring the literal reading and comprehension of advertisements and short reading passages). The results of S1 and S2 for each of these types of questions are indicated in Table 3.

TABLE 3: ABLE Level 1 Reading Comprehension Results According to Type of Question (% Correct).

Signs	Cloze	Paragraph
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TOTAL	(/9) (/40)	(/18)	(/13)
S1	44% 45%	44%	46%
S2	66% 73%	55%	100%

The test items in the ABLE Level 2 Reading Comprehension subtest are either signs or paragraph comprehension. There are no cloze questions. All questions are multiple choice and together look at four types of reading skill, described by Karlsen & Gardner (1986) as follows:

Functional Reading: reading and comprehending printed material that is typically encountered in everyday life.

Educational Reading: reading and comprehending passages that are typical of material found in informational pieces and content-area textbooks.

Literal Comprehension: the comprehension of explicitly stated meanings and details by answering questions about different kinds of reading material.

Inferential Comprehension: drawing conclusions and making inferences and generalisations from explicitly and implicitly stated meanings by answering questions about different kinds of reading material.

The ABLE Level 2 Reading Comprehension results for S2 are shown in Table 4.

TABLE 4: ABLE Level 2 Reading Comprehension Results (% correct)

	S2
Functional Reading (/24)	79%
Educational Reading (/24)	54%

Literal Reading (/24)	84%
Inferential Reading (/24)	50%

It could be contended that a practise effect contributed to S2's superior performance in Level 2 when compared to Level 1. It is not likely that a practise effect could account for this difference however, as the only part of the test which is the same in Levels 1 and 2 is the literal comprehension of passages which S2 scored 100% in for Level 1 and 84% in for Level 2.

Tables 3 and 4 indicate that S2's strongest reading skill is her ability to do literal comprehension, whilst her weakest reading skill is inferential reading. In the Level 1 test the greatest weight is given to cloze questions (18 of the 40 questions are cloze questions) which are inferential in nature. As noted by Sticht (1990) in their review of the ABLE, the cloze questions that are asked in Level 1 require "predicting what an imaginary person did in a given situation when there is no way to know for sure. The "correct answer" presumes the imaginary person will act in the rational, safe or common manner, but people do not always do so" (p13).

The cloze questions propose a difficult task for the reader who is first required to create the context and then to infer information from it. To do this it is necessary to read all the questions in one "set" first in order to establish the context and then to go back and determine the correct answers. The ability to do this would be beyond many low level readers, particularly deaf low level readers, as Johnston's (1985) review of research in this area points out, "the inability to make inferences from contextual clues coupled with a lack of understanding of figurative language is a major contribution to the problems in reading for the hearing impaired

(deaf)" my
italics. Cloze questions are made doubly difficult when the topic of the
questions is
extraneous to the experience of the reader thus further impeding a deaf
reader
from gaining an overall understanding of the content. For example:

15. My grandmother always told me when crossing the road to look to
the right before looking to the

- * left
- * right
- * road

16. because looking to the left side first was

- * good luck
- * bad luck
- * easier

17. I never believed it, but I still look to the right

- * last
- * second
- * first

18. It's gotten to be a

- * habit
- * pleasure
- * chore

Note: This example is similar to, but not included in, the ABLE.

The response of each candidate to the above questions reads as follows:

S1: "My grandmother always told me when crossing the road to look to the
right
before looking to the road because looking to the left side first was
easier.
I never believed it, but I still look to the right first. It's gotten to
be a
pleasure."

S2: "My grandmother always told me when crossing the road to look to the
right
before looking to the left because looking to the left side first was
easier. I
never believed it, but I still look to the right second. It's gotten to be
a
pleasure."

It is probable that S1 started with the reasonable assumption that one should look to the road before crossing it. However, having set up this scenario, the next part of the story did not make sense. S1 was evidently unable to change her original hypothesis.

Both S1 and S2 decided that looking to the left side first was "easier". This decision may be due to the fact that generally, deaf people have limited exposure to abstract concepts. A deaf person's childhood is filled with concrete information and concepts as they are easier to communicate. This in turn biases them to think in a concrete way. Therefore when confronted with a choice between an unfamiliar and abstract concept such as whether looking to the left or the right when crossing the road is "good luck" or "bad luck", and a concrete and familiar concept relating to the "ease" of looking when crossing the road, deaf people are more likely to choose the concrete and familiar option.

Both S1 and S2 conclude it had become a "pleasure" rather than a "habit" or a "chore". This may be because "habit" and "chore" are concepts that deaf people would be far less familiar with than "pleasure". In fact, there is no sign for "chore". At least by selecting "pleasure" they knew what they were saying. Additionally, there may be a bias to give a positive response when in doubt.

Deaf peoples' generally limited knowledge of the structure of English means that they are further disadvantaged when attempting cloze questions. For example, deaf people have difficulty differentiating between two answers that are the same but are written in a different tense, such as "I asked him what he think/ thought". This is because of the influence of the visual way in which deaf people perceive language (spoken or signed), and the influence of the grammar of Australian Sign Language (Auslan) whereby the tense of a sentence is established at the beginning

of the sentence and all the following signs remain in the present tense, for example; "Yesterday, me food buy", which is Auslan for "Yesterday I bought food".

Additional problems with the above cloze questions are that there is no exclusively correct answer for Question 16, in Question 17 the answers "last" and "second" actually mean the same thing, and the phrase "it's gotten to be a habit" in Question 18 is not good English anyway.

The above discussion casts doubt on the appropriateness of the ABLE Level 1 Reading Comprehension test for testing the reading comprehension of low level deaf readers. It would be more appropriate to use an informal reading assessment alone with those adults who have Selectable scores below 20 (Selectable reading scores of below 13). Informal literacy assessment enables greater flexibility and adaptability of test materials and procedure and is a less intimidating way to assess people who often may feel threatened by formal assessment. Informal assessment also has higher face validity than standardised tests.

Combined Informal and Formal Reading Assessment Results.

S1 is able to recognise familiar words out of context and can focus on the meaning of a sentence rather than the individual words. She can decide when something is too hard to read, for example she comfortably read the band D newspaper article and was able to find the main idea, however, when presented with a newspaper article of Band E difficulty she was unable to say what the main idea of this article was. S1 comprehends text at a literal level and is unable to extract embedded ideas or implied messages from text or interpret different levels of meaning in multilevel material. S1's performance on the ABLE Level 1 Reading Comprehension subtest indicates that she is generally able to comprehend stated meanings and details given in simple printed signs and labels, short reading

passages and advertisements (literal comprehension) and is generally unable to infer meanings from a passage.

In summary on the ALAN Reading Competency Scale, S1 is best described by Band D, that is: she has established the reading behaviour of Bands A - D, she is still developing the reading behaviour patterns of Band E and as yet does not demonstrate the reading behaviours described in Bands F - I.

S2 is able to use familiar words and context to determine the meaning of a specific unfamiliar word from a simple text. When presented with a band D newspaper article, S2 was easily able to find the main idea. Similarly, when presented with articles of band E & F difficulty, S2 was able to identify the general idea of these articles and discuss the story, demonstrating an ability to re-read the text for detail and an ability to call on her own experience to understand the text. Most, but not all, aspects of Band F reading skill are demonstrated by S2. S2's performance on the ABLE Level 2 Reading Comprehension subtest, indicates established competency in the areas of functional reading and literal comprehension, with some ability to draw conclusions and make inferences and generalisations from explicitly and implicitly stated meanings.

In summary on the ALAN Reading Competency Scale, S2 is best described by Band E, that is: she has established the reading behaviour of Bands A - E, she is still developing the reading behaviour patterns of Band F, and as yet does not demonstrate the reading behaviours described in Bands G - I.

Formal Numeracy Assessment.

Based on their SelectABLE scores, S1 completed the ABLE Level 1 Problem Solving subtest and S2 completed the ABLE Level 2 Problem Solving subtest.

The ABLE Level 1 Problem Solving subtest is "dictated" (signed) to candidates to ensure that their limited reading ability does not impede their understanding of the questions.

Both ABLE Level 1 and Level 2 Problem Solving subtests are divided according to the following clusters (Karlsen & Gardner, 1986):

- * Determining an outcome:solving consumer-related problems , using whole numbers, fractions, decimals and percentages.
- * Recording and Retrieving:reading and interpreting information presented in a graph or gauge.
- * Geometric Concepts:recognising geometric properties and computing the perimeter, area, and volume of shapes.
- * Measuring:applying knowledge and understanding of the tools and units of measure related to time, temperature and quantity.

S1's results on the ABLE Level 1 Problem Solving subtest are presented in Table 5.

TABLE 5: S1'S Results on the ABLE Level 1 Problem Solving subtest.

		Raw Score
[40%]	Determining an Outcome (/10)	4
[100%]	Recording and Retrieving (/3)	3
[100%]	Geometric Concepts (/3)	3
[25%]	Measuring (/4)	1

S2's performance on the ABLE Level 2 Problem Solving subtest are presented in Table 6.

TABLE 6: S2'S Results on the ABLE Level 2 Problem Solving subtest.

	Raw Score
[%correct]	
[71%] Determining an Outcome (/14)	10
[100%] Recording and Retrieving (/4)	4
[25%] Geometric Concepts (/4)	1
[75%] Measuring (/8)	6

Combined Informal and Formal Numeracy Assessment Results.

S1's performance for both the informal and formal numeracy assessments indicate that she is competent at straightforward addition, subtraction and multiplication but has difficulty with problems involving division, fractions or more than one operation. S1 is confident and accurate with reading and interpreting information presented in a graph or gauge, recognising geometric shapes and computing perimeters. She is not able to calculate percentages but is able to solve consumer-related problems using whole numbers.

In summary on the ALAN QIP Competency Scale, S1 is best described by Band D. That is, she has established the numeracy behaviour of Bands A - D, she is still developing the numeracy behaviour of Band E and as yet does not demonstrate the numeracy behaviours described in Bands F - I.

S2's performance for both informal and formal numeracy assessment indicate established competency in determining an outcome, recording and retrieving and measuring. Although S2 can sort, classify and file complex information systematically, she does not recall formulae and equations relating to geometric concepts (Band G) and is not able to work out alternative ways to do problems such as division and calculating percentages that she normally does using a calculator (Band F). S2 is also unable to recall how to do algebra (Band H) or work out short cuts in computation (Band H).

In summary, S2 is best described by Band E of the ALAN QIP Competency Scale.

That is, she has established the numeracy behaviour of Bands A - E, she has established most of the numeracy behaviour of Bands F and G and is yet to establish the numeracy behaviour described in Bands H and I.

CONCLUSION.

It is reasonable to assume that for various reasons, deaf adults will be delayed in language acquisition which will result in a low level of reading ability and educational achievement. The results of the literacy and numeracy assessment of S1 and S2 are indicative of the literacy and numeracy skills of members of the deaf population in general.

The use of a standardised test, the ABLE, has demonstrated how easily a deaf person can be inappropriately assessed when the assessment tool is not sensitive to the peculiarities of deaf people. This has been shown to be particularly true with the Reading Comprehension subtest for the ABLE Level 1. The ABLE Level 2 Reading Comprehension subtest however, seems adequate for use with deaf people. The use of the ABLE Problem Solving subtest to assess numeracy, has proved less problematic than the Reading Comprehension subtest. The dictation (signing) of the Level 1 Problem Solving subtest to candidates ensures their understanding of the questions. S2's results on the Level 2 Problem

Solving

subtest do not suggest any particular problems due to the test itself, however, it would be ideal if this subtest was also dictated to candidates so that the level of a candidates literacy ability would not influence their numeracy assessment. It is primarily the Level 1 Reading Comprehension subtest that has proven questionable for use with deaf people. Standardised tests are not the preferred means of assessing the literacy and numeracy of deaf people for the purpose of job placement. If a standardised test is employed, it should be used to describe individuals according to their personal strengths and weaknesses, in order to match these to the demands of a particular job, rather than to describe their strengths and weaknesses when compared to the general (hearing) population. Informal assessment, as has been shown, can be more appropriate, accurate and adaptable than formal assessment using standardised tests.

In the present paper, literacy and numeracy assessment is coupled with use of the ALAN competency scales. The ALAN competency scales has enabled the assessor to describe and report the idiosyncratic literacy and numeracy abilities of S1 and S2 with a common frame of reference; "The framework of reporting is standardised. The method of assessment is liberated" (Griffin et al, 1992:22). The next step is to determine the literacy and numeracy requirements of jobs perceived to be appropriate for S1 and S2 and report the job requirements according to the ALAN competency scales. In this way the closest match between the deaf individual and suitable employment can be made which is the main concern of the WAP.

APPENDIX A

DEAFNESS AWARENESS TRAINING FULL DAY PROGRAM

OBJECTIVES:

*To become aware of the different types of hearing-loss and their implications

*To understand the communication process and gain insight into communication barriers frequently experienced by people who are Deaf or Hearing Impaired

*To become familiar with the modes of communication used by people who are Deaf or Hearing Impaired

*To develop ways of communicating effectively with people who are Deaf or Hearing Impaired

*To learn how to use a Sign Language Interpreter

PROGRAM OUTLINE:

*Introduction

*Communication Exercise

*Implications of Hearing Loss

*Communicating with people who are Deaf or Hearing Impaired:

-Communication Tips

- Communication Options

- Sign Language and Fingerspelling

*Effective use of a Sign Language Interpreter

*"It's a Deaf Deaf World"

**At your request, additional topics may be included/substituted in the above program, eg: Training Tips, Supervisors Tips, Reasonable Adjustment, Employment, Workplace Assessment

(An information package will be given to all participants)

COST:\$100.00 per person (Full Day)

\$ 65.00 per person (Half Day)

\$150.00 (one hour)

This program has been designed to meet the requirements for a "structured training program" as provided under the Training Guarantee (Administration) Act 1990.

Supporting documentation is available to employers.

For further information contact Anne Horton
Deaf Society of NSW: (02) 560 6433 (voice) or (02) 564 2202 (TTY)

APPENDIX B(i)

RATING SCALES - READING

1.Beginning

This level applies to people who want to read, know that words are symbols for things, recognise simple words and know the difference between letters, words and numbers. They can recognise their own name in print.

2.Recognition

This level applies to people who read some phrases and recognise familiar words out of context. They identify key words and are prepared to take risks when reading and will guess unfamiliar words.

3.Accessing Basic Information

At this level people read with definite purpose, focussing on the meaning of sentences rather than words or their pronunciation. They understand the relationship between the presentation of text and its purpose, and can decide what is easy or too hard to read.

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4.Understanding Familiar Concepts

People at this level read simple texts and short books of special interest, without seeking help. They comprehend text at the literal level and can find the main idea in short simple passages. They understand the meaning of the words "first", "next" and "then" as indicator words.

5.Identifying the General Idea

At this level, people can understand and explain the main point in a passage. They can locate detail and can select relevant information for a specific task.

APPENDIX B(i) - continued

6.Identifying and Connecting Detailed Information

People at this level can read from a range of material for a

variety of purposes - personal, vocational, educational and social - each with its own vocabulary and acronyms. They can follow detailed written instructions and identify and interpret information from lengthy articles or texts.

7. Interpretation and Generalisation from Complex Information

At this level, people understand the difference in types of texts and writing styles. They are able to compare, generalise and support arguments with information obtained from a range of sources. They are aware of the range of possible interpretations of text and can defend an alternative point of view.

8. Integration and Analysis

People at this level can understand and re-interpret ideas presented in specialised technical literature. They are able to give a critical opinion of and analyse issues encountered in text. They can identify and take account of writer's bias and of emotive and persuasive language.

9. Subtlety and Insight

At this level people are able to interpret different levels of meaning in multi-level material. They are able to extract embedded ideas and implied messages from complex texts. They are able to identify irony and unsupported assertions.

Simplified Scale adapted from the ALAN Literacy: Reading Competency Scale. Griffin, P & Forwood, A (1991) Adult Literacy and Numeracy Competency Scales An International Literacy Year Project. Assessment Research Centre, Phillip Institute of Technology, Alva Grove, Coburg, Victoria.

APPENDIX B(ii)

Commonwealth Bank Australia: Poster.

Hours of business at
this branch are

Monday - Thursday
9.30 - 4.00pm

Friday
9.30 - 5.00pm

APPENDIX B(iii)

Commonwealth Bank Australia: Poster.

Which super plan suits your lifestyle?

NO
ENTRY fees,

NO
EXIT fees,

.... take the freeway

Commonwealth Life Personal Superannuation

APPENDIX B(iv)

Newspaper Article, 1991.
Band D difficulty on the ALAN Reading Scale.

Ballarat Golfer Paul Bourke won numerous trophies at the recent
Australian Deaf Games in Hobart.

He has been chosen to represent Australia against New Zealand in
Perth.

About 900 deaf players from Victoria, Queensland, South Australia,
New South Wales, Western Australia, Tasmania and the ACT attended.

There were four golf teams Victoria, Queensland, South Australia and
NSW.

Bourke and Richard Toyne from Geelong won the foursome aggregate

by 30 shots, however Western Australia won the aggregate with Victoria second.

In the 72 holes championship, Queensland won the shield.

Bourke finished second, losing the play-off to Queensland's Wayne Parsons.

Bourke said yesterday, players wearing hearing aids discarded them for the golf tournament.

His wife Heather caddied for him during one round.

Jim Murphy

äAPPENDIX B(v)

Newspaper Article; "The Daily Telegraph Mirror", August, 1991
Band E difficulty on the ALAN Reading Scale

Aspiring young actress Sofya Gollan let her fingers do the talking after receiving an award yesterday.

Drama student Sofya, who won a Queen Elizabeth II Silver Jubilee Trust for Young Australians award, is deaf.

Speaking through a sign language interpreter at Government House in Sydney, 22 year-old Sofya said she saw no reason why a deaf person couldn't act.

"There is a lot of potential for deaf actors in television soap series and I can't see why that is not possible" said Sofya, who has made a guest appearance on the ABC's GP series.

"So many people have deaf people in their lives and they shouldn't be locked in a cupboard not to be seen".

"I think (American deaf actress) Marlee Matlin has done a lot in showing it is possible for deaf people to become actors - especially when she won the Academy

Award (for Children of a Lesser God)".

"I hope to emulate her"

The Queen Elizabeth II Silver Jubilee Trust for Young Australians, given out every year, was awarded to 12 individuals to further their careers and to six organisations for their help within the community.

Geoff Henderson

APPENDIX B(vi)

Newspaper Article; "Canberra Times", October, 1990.
Band F difficulty on the ALAN Reading Scale.

Today Tony Meli, 21, of Chapman will be the first apprentice with hearing impairment to complete the four-year trades certificate in carpentry in Canberra.

Regardless of that, his supervisor, the senior foreman of the ACS Joinery Workshop, Robert Heath, considers, Mr Meli, totally deaf from birth, one of the best carpenters in the workshop.

"He takes pride in his work" Mr Heath said yesterday. "He is not like other apprentices, he works hard and doesn't get distracted. He only needs to be shown once what to do."

Four years in the workshop have taught many of Mr Meli's colleagues sign language, some of which are peculiar to carpentry. But since his "bionic ear" implant in December, 1988, which provides limited hearing, and having had speech therapy, he has not had to rely on sign language entirely. He is beginning to speak.

Working as a carpenter has been "beautiful" he said yesterday. "It has been asometimes hard but you can do it, you can work here."

His message to others with hearing impairments is to "try hard to do what I have done".

The future is not certain. After his four-year contract ends today, he has a definite three-month contract with the ACS. However, the ACS faces cut-backs and Mr Meli is not the only carpenter facing possible retrenchment.

David Sibley

APPENDIX C(i)

RATING SCALES - WRITING

1. Beginning

A person at this level knows that writing is used to communicate, can write down numbers, letters and simple words. They know that written English goes from left to right. They can copy their own name and address, numbers and familiar words. They can write their own name.

2. Words and Simple Sentences

People at this level are able to write short messages without structure. They can convey meaning in writing using simple words. They are concerned about spelling things the right way and use simple sentences with familiar vocabulary. They can use writing to communicate. They can write shopping lists and short letters.

3. Record and Convey Simple Language

People at this level write for familiar purposes and use short simple sentences. They can write in the first person (ie: use "I") and spell using recall of visual word patterns. They can complete simple forms requiring basic personal information. They can transcribe information and data from one setting to another. They can address letters and envelopes, write short personal letters and complete simple reports about events.

4. Independent in familiar contexts

People at this level write purposefully when they are writing for a familiar audience. They know that different writing styles are used for different purposes. They can organise into sentences and paragraphs. They can proof read for clarity and replace sentences to improve meaning. They can use a dictionary or

thesaurus, they can write letters, reports and memos with some detail, they can complete complex forms without any help and fix up their mistakes when writing. They are concerned about spelling and grammar.

APPENDIX C(i) - continued

5. Complexity of Style and Structure.

People at this level write in a small range of styles to suit specific and familiar audiences. They can vary between formal and informal tones. Their vocabulary can be changed to suit the purpose of writing. They pay attention to sequence, clarity of ideas and style. They can write technical reports, use headings, and diagrams, use continuous form or point form. They can write in basic standard English.

6. Competent in Standard Conventions of Writing

At this level people can write on a range of topics with confidence. They can link paragraphs into a coherent report or story. They can vary sentence length and structure and can plan ahead what they will write. they can edit and proof read to improve grammar, vocabulary, punctuation and spelling. They can write detailed and lengthy reports and use extensive and appropriate vocabulary.

7. Manages Complex Writing Tasks

People at this level are aware of audience bias and needs. They can write in personal and impersonal styles and quote direct speech where needed. They can produce extended persuasive and argumentative writing, excluding irrelevant materials. They are able to proof read to present clear, correct information with spelling, grammar, punctuation and vocabulary. They can include subplots in their writing and use appropriate technical vocabulary.

8. Sustained Development and Style in Writing

People at this level develop and sustain argument and style. Their writing is organised, coherent and clear. They can convey

ideas of cause and effect. They are able to vary their style to suit the audience and purpose including professional and technical audiences. They are able to write extended reports and papers, as well as personal, business and professional correspondence. They can synthesise data from a variety of sources and can edit and improve other people's writing as well as their own writing to suit the requirements of a range of audiences.

APPENDIX C(i) - continued

9.Command of Style and Structure

At this level, people are able to select the type of writing that is appropriate according to a wide range of audiences and purposes for writing. Their grammar, vocabulary and style can be manipulated to produce an original and individual style that is correct and appropriate. They can easily switch among descriptive, narrative, creative, argumentative, expository and other types of writing. Other people may use the writing of people at this level as a model.

Simplified Scale adapted from the ALAN Writing Competency Scale. Griffin, P & Forwood, A (1991) Adult Literacy and Numeracy Competency Scales An International Literacy Year Project. Assessment Research Centre, Phillip Institute of Technology, Alva Grove, Coburg, Victoria.

APPENDIX C(ii)

VOCATIONAL ASSESSMENT.

Name (in full):_____

Address:_____

Date of Birth: ____/____/____ Age:_____ (yrs)____ (mths)

Present Occupation: _____

Briefly write about your job: (What do you do? Do you like it? Why?)

What are your hopes and plans for future work? _____

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I would like a job that:
that:

1. _____
2. _____
3. _____

I would not like a job

1. _____
2. _____
3. _____

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