Dynamic Assessment and Programme Planning For Students With Intellectual Disabilities

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This article explains how dynamic forms of assessment and intervention can be applied for the purpose of enabling students with intellectual disabilities to achieve their optimal level of functioning. Dynamic assessment refers to methods and approaches that are data-based, and allow for the collection of information about the learner's zone of proximal development (zpd) through exploring the student's functioning while interacting with a more experienced collaborator. The purpose of assessment in this context is to develop and explore hypotheses about the nature of obstructions to learning and methods for effectively facilitating the student's performance. Examples of assessment methods are offered to illustrate the process of dynamic assessment and how this can be applied in different educational situations. Dynamic assessment and education are not only concerned with task acquisition but with enhancing the student's quality of life through the development of critical skills for participation in education and community.

Despite the significant amount of attention that has been given in recent years to the educational and legal rights of students with disabilities, there remains much debate about the provision of appropriate education. There has been controversy about the right of parents to choose between segregated or regular settings for their children with special needs. Likewise, there have been major arguments concerning resourcing and entitlement to receive special education (Mitchell & Ryba, 1994). The view advanced in this article is that while much emphasis has been placed on "active participation" in school by students with intellectual disabilities, there is a need to put into place "dynamic assessment and education strategies" that can enable these students to achieve their full potential. Dynamic assessment in this context can be defined as the provision of intensive, systematic instructional procedures aimed at developing and exploring hypotheses about the nature of obstacles to learning and methods for effectively facilitating the student's performance (Lidz, 1997). From this perspective, the assessor has an active role in the assessment process through gathering data on student performance in response to certain interventions and adaptations to the learning environment. By following data-based procedures, the aim of dynamic assessment is to determine precisely what needs to be to done to create better learning conditions so that each student can function in the least dependent way. With this requirement in mind, the purpose of this article is to outline and illustrate some principles and practices of dynamic assessment and intervention for students with intellectual disabilities.

Debate has centred on the value of inclusive education and issues surrounding the provision of resources and services to students with intellectual disabilities. What is not so well recognised, however, is that many of the difficulties in providing appropriate education for these students have arisen due to the lack of attention that has been given to the use of dynamic and strategic forms of assessment and educational programming. A related point is that, the greater the knowledge and skills possessed by the practitioner, the fewer the pre-requisites for learning required of the student. Assessment and programming are strategic processes that require a range of skills and knowledge, including: (1) skills in applied behaviour analysis; (2) strategies for adapting tasks and learning environments; (3) experience in identifying critical skills to be taught; (4) skills in using dynamic assessment and strategy

training; (5) skills in applying a range of interactive teaching methods; and, (6) skills in using assistive technology.

In New Zealand, principles of appropriate education of students with education support needs have been well defined in the recently released *Special Education 2000* Policy (Ministry of Education, 1996a). This document notes the need for "a guaranteed level of resourcing for students with high need of learning support." Moreover, it notes that "specialist support must be accessible in order to ensure that families, schools and teachers achieve the best possible learning environment." However, specialist support is not likely to be sufficient unless teachers and other educational personnel have an understanding of assessment and methods for adapting the curriculum to meet individual needs. The following section illustrates how dynamic assessment can be applied to determine the learning potential and adaptive behaviour of the student rather than measuring current deficits in their level of functioning (Fraser, Moltzen & Ryba, 1995).

Educator as Problem Solver: A Constructivist Perspective

The concept of teacher as problem-solver has been advocated as an approach to training and professional development in education (Ryba & Brown, 1994). 'Problem solving' within this context is concerned with the creation of practitioners who are strategic and able to capably link psycho-educational theory to practice. This idea is exemplified by the adoption of problem-based approaches that train practitioners in research methodologies that enable them to think critically in analysing and responding to psychological problems. Such research training has a problem solving focus that utilises a framework for analysing psychological problems, devising and evaluating solution strategies (see Robinson, 1993).

Constructivist approaches have had a significant impact on most revisions of school curricula. This impact is evident in the *New Zealand Curriculum Framework* where emphasis placed on such essential skills as problem-solving, self-management, and social and cooperative skills (Ministry of Education, 1993a). In the *Draft Technology Curriculum*, for example, attention was given to the importance of technological activities for identifying, organising, analysing, and evaluating information. Likewise, the technology curriculum was seen as providing rich contexts for developing problem solving skills such as defining and analysing problems from a variety of perspectives (Ministry of Education, 1993b). Constructivist approaches portray learners as active processors of information who develop their own theories and ways of understanding through selecting, organising, connecting and otherwise making sense of information basis on prior knowledge and experience (Meltzer, 1994).

Constructivism represents a shift in thinking about special education support. It is based on the recognition that many traditional assessment methods have not kept pace with reconceptualisations concerning student-centred collaborative approaches (Meltzer & Reid, 1994, pp. 338-339). An essential characteristic of the constructivist approaches is the attention that is given to support of the learner's language and information processing skills. It is through language and the exchange of information with others that learners become active meaning makers who select, organise, connect, and make sense of new information. The main features of a constructivist approach to assessment have been summarised by Meltzer and Reid (1994, pp. 335-338) as follows: (1) it is holistic and dynamic; (2) it is multidimensional and accounts for the interactions among cognition, motivation, self concept and learning; (3) it accounts for the complex interactions between development and curriculum; (4) it addresses metacognitive processes and strategic learning; (5) it is continuous with instruction.

Changes in practices within educational psychology have highlighted the problems associated with utilising standardised assessment and diagnostic methods. Over-reliance on psychological testing, and other norm referenced forms of measurement frequently reduced student information to simply compared numbers (Meltzer, 1993). Recently, however, there has been a shift toward 'authentic' or performance-based assessment methods which provide students with meaningful and challenging tasks that are closely related to ones that the student would be expected to perform in the real world (Hacker & Hathaway, 1991). These methods include performances, exhibitions, self-assessments, portfolios and multimedia computer projects. Such assessment approaches are ecologically valid in that they take a holistic and realistic approach to assessing a student. The best and most effective forms of assessment will be those that provide information that is directly relevant to the next step in the teaching and learning process.

Dynamic Assessment That Is Data-based

Dynamic assessment requires analysis, not only of the student's performance, but of the teaching task. Through systematically gathering information on methods of teaching and learning with an individual

student, it becomes possible to identify the specific conditions that are likely to enhance student performance. This is not to imply that current assessment methods are deficient and undesirable but that a change of mindset is required to use the assessment context as a more investigative procedure aimed at creating better learning conditions. A central guiding concept in services for students with disabilities is the role of psychologists and special educators as problem-solvers (Deno, 1995). Working within such a framework allows practitioners to use a range of skills and to work strategically (and scientifically) to put into place conditions that enhance student learning. Inseparable from this concept is the requirement to collect data relevant to the specific nature of the decisions to be made. The selection of data collection methods should be based upon an understanding of "what do we need to know" (Lidz, 1997).

Research with students who have learning difficulties highlights the fact that many of these students are active but ineffective learners. Despite high levels of persistence and attention to tasks, these students often display inefficient cognitive processes and fail to use appropriate problem solving strategies (Torgeson, 1978). Swanson (1989) has suggested that students with learning disabilities can be considered as "actively inefficient learners" in the sense that they demonstrate difficulties in four main areas: (1) accessing, organising and coordinating multiple mental activities simultaneously and in close succession; (2) lack of flexibility in the application of strategies even when they are aware of the strategies to be used; (3) difficulties engaging in self-regulatory strategies such as checking, planning, monitoring and revising; and, (4) limited awareness of the usefulness of specific strategies for solving particular tasks (Meltzer, 1993).

The ability of students to apply effective cognitive and metacognitive strategies has been shown to be strongly influenced by motivational factors including attributions for success and failure. The importance of attributions that affect motivation have been well documented in research (Torgeson & Licht, 1983). Findings indicate that students who attribute their difficulties to external factors beyond their control, are often less active in the use of problem solving strategies and tend to avoid challenging tasks for fear of failure (Torgeson & Licht, 1983). Such perceptions of limited power to control and direct their thinking processes can lead to the development of "learned helplessness" in which students become inactive and inefficient learners. Thus, strategy use appears to be connected to feelings of empowerment and the willingness of students to invest the necessary energy to apply strategies for active problem solving and learning (Meltzer, 1993). There is growing evidence now that data-based dynamic forms of collaborative assessment can support the development of self efficacy in learning and behaviour (Ryba, Selby & Nolan, 1995). It is important however that dynamic assessment and strategy training be anchored to the essential learning areas for each student and related to curriculum objectives.

Dynamic Assessment That Is Curriculum-Based

An important step forward in providing appropriate education for students with intellectual disabilities is to confront the question "What do we need to teach?" By extension, the answers to this question require that we have criteria that specifies what is meaningful, what is appropriate and what will enhance the learner's quality of life. The question about what is an appropriate education for students with intellectual disabilities cannot be answered simply by consulting a curriculum guide (Orelove, 1991). For students with a limited response repertoire, a step by step skill development approach is impractical. Even with the extensive use of task analysis, the behaviour often becomes sliced so fine that the resulting individual units of behaviour have little clear function for the individual.

To be useful, a curriculum needs to provide meaning and direction to our education mission. The recently released *Te Whariki Early Childhood Curriculum* (Ministry of Education, 1996b) is useful in this regard because of the way in which it outlines the principles and goals as a foundation for every child's development. This document is very informative in that it fits well with inclusive practices and with the bicultural context of Aotearoa New Zealand. A feature of Te Whariki is the emphasis that it places on teaching a set of effective behaviours that enable the student to have some meaningful effect on their social environment. The social environment includes the learners' peers, teachers, parents and caregivers as well as significant others. The value of an effective behaviour rests in its life beyond the simple response itself. For example, a fundamental movement such as head turning can have significant effects through engaging others in the environment to change their style of communicating and frequency of interacting. Thus, the behaviour itself, although small, may trigger an "avalanche" of responses by affecting other individuals who, in turn are more likely to prompt other behaviours in the learner (Orelove, 1991).

Curriculum-based assessment (CBA) has been

advanced as a clear means of relating individual learning objectives to the curriculum. The value of CBA is seen in terms of its objective, data-based approach to assessment and the relevance it has to essential skills and learning areas defined by standards contained in the *New Zealand Curriculum Framework* (1993a). CBA measures are based on several characteristics considered important for monitoring student progress. These are: (a) anchored to the curriculum; (b) brief to allow frequent administrations; (c) authentic and based on realistic tasks; (d) sensitive to measuring gains in learning and behaviour (Jenkins, Deno & Mirkin, 1979). Curriculum-based methods offer an alternative to psychometric assessment techniques. Reliable measures can be developed that are less time consuming and can be administered by teachers and others who are trained to do assessment with the student. Perhaps most importantly, CBA enables a detailed analysis of skills and behaviours in order to determine what changes can be made to enhance the performance of the student.

CBA is limited by the fact that it provides quantitative but not qualitative information on the student's current functioning level (Lidz, 1997). Both curriculum-based and norm-referenced assessment fall short in providing an understanding of the learning potential of the student. To address this limitation, Feuerstein (1980, 1981) developed the concept of measuring learning potential through the use of process-oriented assessment. At the core of Feuerstein's paradigm is the concept of cognitive modifiability in which the goal of instruction is to alter the nature of certain cognitive processes that determine functioning. Assisted assessment approaches have been developed as an extension to the basic principles embedded in the approaches of Feuerstein (1980, 1981). A major theme in the Feuerstein instrumental enrichment methods is that the "learning potential" of the student can be identified using an 'assess-intervene-assess' method. The *Learning Potential Assessment Devise* (LPAD) is theoretically related to the work of Vygotsky (1978) concerning the concept of "zone of proximal development" (zpd) in which the interactions that take place between more and less capable peers or adults and children can have a significant impact on learning.

The zone of proximal development (zpd) is concerned with what the student can accomplish with the help of a more experienced collaborator. The zpd defines the student's instructional level and identifies what needs to be done in order to facilitate learning. From this perspective, when a student is not making progress in their learning, it is likely that the instructional level is not within the student's zpd. The zpd is a product of the interaction between the learner and the teacher. Accordingly, it requires an awareness of the student's level of functioning as well as an understanding of factors that can enhance instruction. The nature of the interaction between the student and the teacher is to develop and explore hypotheses about the nature of obstructions and ways to effectively facilitate the performance of the child. The zone of proximal development fits well within an ecological model as it stresses the importance of studying the interactions between the learner and other people and the environment in order to pinpoint what needs to be done in order to create better learning conditions. For example, a student with severe intellectual disability may be more responsive to cause and effect learning during certain activities—e.g. music, multimedia computer programmes (Ryba, Selby & Nolan, 1995).

While dynamic assessment can take many different forms, there are three general characteristics that are common to all approaches: (1) pre-test/ intervention/post-test; (2) active participant role of the student and the assessor; and, (3) an analysis of the teaching and learning processes in relation to educational outcomes. Various assessment methods have been devised to examine the learning process and potential of students. These include Swanson's (1996) *Cognitive Processing Test*, Feuerstein's (1979) *Learning Potential Assessment Devise* (LPAD), and Meltzer's (1993) *Surveys of Problem-Solving and Educational Skills* (SPES). The SPES comprises a series of diagnostic tasks that evaluate the cognitive and educational strategies that the student uses. The intention of these assessment methods is to examine current functioning levels in different cognitive and educational domains and to gather data from both objective performance and observations concerning the students thinking and problem solving skills as well as their impact on academic performance.

Information on the responsiveness of the student to intervention and the efficacy of interventions that facilitate performance can be gathered through a dynamic assessment process. Dynamic assessment is exploratory in nature and concerned with problem solving that is directed toward understanding the student's learning process. The following example shows how dynamic assessment can be incorporated as a part of the overall assessment repertoire. Information gathered through the use of such methods can result in increased understanding about how the student learns and what adaptations can be made to improve the effectiveness of instruction.

A Practical Example of Dynamic Assessment

The following example is presented to illustrate the socially interactive and reflective nature of dynamic assessment. The methods used are largely collaborative and aimed at the assessment of thinking skills and learning strategies.

Student

MaryAnn, CA 15 years, 6 months

Reason for Assessment

Concern was expressed that MaryAnn was achieving below her level of potential. She is a cooperative student who tends to be passive and dependent upon others for direction. The assessment was requested to assist in identifying some strategies that would help to promote her learning in curriculum areas where she was currently under-achieving.

Background Information

MaryAnn's developmental and educational history are well reviewed in previous reports. She lives with her mother and a younger brother close to the high school. The family has been in this location for several years after moving several times as a result of her father's employment. MaryAnn's father now lives in another city approximately 200 kms. away. He has occasional contact with his daughter, primarily during the school holidays. MaryAnn has been diagnosed with Down Syndrome. She attended the special school and then graduated to a work experience class at the high school where she is attending at present. MaryAnn likes to assist her teacher Mr. Smith with tasks in the classroom. She is always first to volunteer for chores and is perceived by teachers as a pleasant and co-operative student who appears to be achieving significantly below her ability level.

MaryAnn shows wide variations in her levels of performance when tested. Some kinds of performance are at an average level of expectation for her chronological age. These include short term memory, executing a series of verbal instructions, and decoding. Her weakest areas are with reading comprehension, mathematics, and social interactions. She prefers to work on her own most of the time and seldom interacts with other students during interval or at lunchtime. MaryAnn is extremely interested in using computers and is able to help students with loading games and instructional programmes. She avoids reading and other situations where she is failing academically. Behaviourally, she is quite passive and tends to take her lead from other students. She seldom speaks but can be encouraged to do so in a one-to-one situation. MaryAnn has a large sight vocabulary, especially for technical words. Her reading comprehension is at the eight-year level. In contrast, her nonverbal performance indicates that she is functioning at an average level with her same-age peers.

Assessment Procedures

Metacognitive Assessment - Using an adaptation of materials from the Raven's Progressive Matrices test (Raven, 1960), MaryAnn was shown a pattern with a bit missing and then asked to point to the piece which best completed the pattern. The assessment took the form of a 'metacognitive interview' in which MaryAnn was asked to provide a verbal response on: (a) the nature of the problem; (b) what she needed to know to solve the problem; and, (c) ways to check whether she was correct or not.

LOGO Programming and Problem Solving - MaryAnn was taught how to control the movement of a turtle that lives in the centre of the video screen. She was shown how to use basic commands to turn the turtle left and right, move forward and back, and to make simple designs on the screen. MaryAnn was taught how to plan and draw her shapes with paper and pencil. She was then asked to type the commands into the computer to produce the design.

Computer Game - This assessment involved teaching MaryAnn how to play a space invaders type game using a task analysis procedure. First she was taught how to load the game. Once this was accomplished she was shown how to move her cursor left or right using the arrows to avoid being hit by invaders. Finally she was taught to move the cursor to avoid being hit while shooting at invaders with the space bar.

Assessment Results

As MaryAnn's learning support teacher, I developed a good working relationship with her. Thus I could easily and comfortably collaborate with her on the assessment tasks. MaryAnn especially enjoys working on the computer and so this was selected as a context for most of the assessments. She is more confident in the computer situation than with other classroom tasks given that she has experienced success in the past in learning with the technology. The learning support team suggested that I should carry out the assessments with MaryAnn as she is inclined to become shy and reticent with people that she does not know. Although the computer was familiar to MaryAnn, she had not previously encountered the assessment tasks.

During the first session, the metacognitive assessment was carried out with MaryAnn. The rationale was to study her thinking and problem solving skills to determine whether she had some strategies to assist with the mediation of her task performance.

MaryAnn had no trouble locating the piece that would complete the pattern but she was not able to explain to me in her own words what the nature of the problem was. When asked "what it is that you needed to know in order to solve the problem", she pointed at the lines. Likewise when asked to tell me how she could check to see if she was correct or not, she ran her finger around the pattern and the lines. A teaching session with MaryAnn was then carried out in which I modelled my response to the questions. Using another matrix, I showed her the important parts and how I would check the number of lines and the directions to see if I was correct or not. As a followup, I did another problem with MaryAnn. This time she was able to clearly explain what the problem was and how she would check the solution. The clarity of her expression was impressive on this occasion. She said, "check lines and check if this way around".

Two days later, MaryAnn and three other students were taught how to do LOGO computer programming with turtle graphics. The students were assigned to work in pairs. This paired approach was useful for encouraging students to help one another and to exchange information in order to solve the problems. At first MaryAnn did not speak to her partner. I intervened, however, by asking them to take turns "saying the turtle commands" and then "writing them down". This worked well as MaryAnn began to speak with her partner about the movements they need to make to draw a square. Although MaryAnn could write down the individual commands, she found it difficult to type them in the correct sequence into the computer. I assisted her with this by asking her to tick each command line as it was entered so that she did not lose her place. This helped somewhat although MaryAnn would easily get distracted by the computer screen and forget where she was.

After the LOGO session, MaryAnn was taught how to play space invaders. At first she did not appear to understand the instruction as she had difficulties moving the cursor left or right using the arrow keys. I then intervened by changing the programme options so that she could use any key on the right and any key on the left side of the keyboard to move the cursor. This worked well as she was able to use keys on the extreme right and left of the keyboard which appeared to be easier for her. I slowed down the program speed so that she could navigate easily. Once she mastered this, we increased speed to the next level and she was able to cope. Finally, I taught her how to 'fire' at invaders. She clearly enjoyed the graphic effects of shooting down invaders! I was impressed by her ability to move in order to avoid collisions and to fire rapidly when under attack by the invaders.

An important finding from the assessment was that, with appropriate support and instruction, MaryAnn was able to substantially improve her performance. She needs extra time to settle into a task and to get familiar with the requirements. It should be noted that MaryAnn encounters difficulties in performing at this level when she is required to work with an unfamiliar person. She is able to give her best performance in a situation where she is confident and comfortable with other people. Computer work is ideal for her as this provides a basis for socialising and developing her language. For instance, she verbalised quite a lot in the cooperative learning task with her partner. Following training on the metacognitive task, she was able to clearly explain to me how to solve the problem and check on her solutions. The use of overt verbalisations appears to assist her to mediate her task performance. Likewise, giving her a strategy for locating her place in a list of LOGO commands was beneficial. On first appearance, it would seem that she is unable to perform such complex tasks. However, when she has some strategies to assist her with problem solving and maintaining attention to the task then her performance improves significantly.

Recommendations and Conclusions

As this assessment has shown, MaryAnn is a capable learner who requires some personal support and scaffolding to make the best progress with her learning. She benefits from being sensitively encouraged to participate in interactive forms of learning. Her tendency is to withdraw from situations where she is afraid of demonstrating failure. For this reason, the computer environment is most beneficial for MaryAnn as it has a positive connotation of success for her. MaryAnn's ability with the computer tasks stands in contrast to her performance in standardised test situations (e.g. WISC III) where she has scored at a low level on verbal tasks. It is apparent from the present assessment results that her true learning potential has been under estimated in the past on traditional measures of intelligence.

There are several specific recommendations that are presented here as guidelines for assisting the development of her thinking skills and learning strategies:

1. Engage her in cooperative work with a peer. Include students with whom she is familiar and who are likely to give MaryAnn a chance to take control of the computer and learning requirements.

2. Encourage her to talk aloud about her performance on the computer. This should help her to mediate her task performance and is beneficial for

language development and socialisation with other students. It also provides her with a language to think with.

3. Ask MaryAnn to explain in her own words what she is doing. Provide her with demonstrations of strategies that assist with task performance. For example, the checking strategy assisted her to perform the LOGO commands in order. These strategies can be important for focusing attention and giving her a sense of personal effectiveness as a learner.

4. The selection of strategies that have both social and cognitive benefits are preferable to teaching functional skills in isolation. Socially interactive teaching methods are preferred as these will facilitate MaryAnn's participation with the environment and with others.

Dynamic assessment involves a wide collection of methods and strategies. The following discussion offers some practical advice on the selection of teaching skills and systematic data collection methods. These examples illustrate how to set up assessment and intervention methods that enable ongoing measurement of changes in behaviour and learning.

Discussion and Conclusion

An overall theme of this article has been on the creation of better conditions for student learning, especially for those with intellectual disabilities. Most of the methods and strategies presented here are not new or unique. What is significant, however, is the emphasis that has been placed upon dynamic forms of assessment in which the assessor collaborates with the student to determine how learning can be facilitated within the student's zone of proximal development (zpd). It is the aim of such collaborative approaches to assessment to determine what the student can achieve when appropriate educational support is provided. From a constructivist perspective, special education can be thought of as a highly strategic process that aims to maximise the student's functioning level through systematic and timely interventions.

Good teaching requires that students become actively engaged in the learning process. Active engagement can take many different forms, but the essential point is that learner centred approaches involving collaboration and knowledge construction within the student's zpd are vital (Meltzer & Reid, 1994). This often requires that students move beyond the boundaries of the classroom in the process of learning tasks and behaviours in real life situations where these are required. It is through active engagement in learning that students begin to perceive themselves as capable learners. If students see themselves as capable of exercising control over the learning environment then they are going to be far more motivated to develop the skills and knowledge they need to succeed in life (Fraser, Moltzen & Ryba, 1995).

The following guidelines are offered to help establish dynamic forms of assessment and education:

1. Collaborative approaches to assessment are likely to yield more valuable information than traditional one-to-one methods, especially with students who have severe disabilities. This requires that attention be given to the student's strengths and how these can be used to help meet their needs.

2. Assessment and intervention are likely to be most effective when linked together as a continuous and ongoing process. This linked process should serve to demonstrate the student's learning potential under optimal conditions.

3. Assessment that makes use of data-based approaches enables the systematic collection of information for comparison purposes.

4. Principles and practices of applied behaviour analysis offer an appropriate means of studying factors that obstruct learning as well as features that facilitate the student's performance.

5. Ecological perspectives on assessment are preferred because of the stress they place on identifying what factors in the learning environment need to be adapted to facilitate the student's performance.

6. A constructivist framework seems appropriate for understanding the nature of collaboration and how scaffolding and other forms of education support can be applied to determine the capabilities of the student.

7. Communications and information technology are ideally suited for collaborative forms of assessment and for developing social interactions and language. As illustrated in this article, it provides a context for demonstrating students' capabilities.

8. Learning strategies assessment is ideal for assisting students to develop their thinking skills and to practice self-regulation of learning and behaviour. This provides for a dual focus on both the learning process and the learning outcomes.

Dynamic assessment is one aspect of a paradigm shift that has taken place from doing assessment 'on'

students to doing assessment 'with' students. The overall aim is to determine their learning capabilities under optimal conditions. Despite the attention that has been given to "active participation" in regular education, there is a need to be more strategic in adapting educational methods to meet the learning needs of students with intellectual disabilities. The development of key skills and responses has the potential to trigger an 'avalanche' of learning.

It is recommended that a shift in focus take place to identify not only curriculum-based skills but individual skills and responses that are likely to have a positive impact on the student's interactions with others. By assisting the student to respond in ways that promote social and cognitive interactions, the stage has been set for future learning opportunities. Finally, educational accountability will benefit from being based not only on evaluation of student performance levels but upon the adequacy and appropriateness of instruction in response to the needs of all students.

References

Ballard, K. (1993). *Disability, family, whanau, and society.* Palmerston North: Dunmore.

Brown, A. L. (1978). Knowing when, where, and how to remember: A problem of metacognition. In R. Glaser (Ed.), *Advances in Instructional Psychology, Vol. 1*, Hillsdale NJ: Erlbaum.

Brown, L. (1991). Who are they and what do they want? An essay on TASH. Introduction in L. Meyer, C. Peck and L. Brown (Eds.) , *Critical issues in the lives of people with severe disabilities.* London: Paul Brookes.

Deno, S.L. (1985). Curriculum-based measurement: The emerging alternative. *Exceptional Children, 52*, 219-232.

Feuerstein, R., Rand, V., Hoffman, M. & Miller, R. (1980). *Instrumental enrichment: An intervention program for cognitive modifiability.* Baltimore: University Park Press.

Feuerstein, R., Miller, R. & Jensen, M.R. (1981). Can evolving techniques better measure cognitive change? *The Journal of Special Education, 15(2),* 201-270.

Feuerstein, R., Rand, Y. & Hoffman, (1979). *Dynamic assessment of retarded performers.* Baltimore: University Park Press.

Fraser, D., Moltzen, R. & Ryba, K. (1995*). Learners with special needs in Aotearoa New Zealand.* Palmerston North: Dunmore.

Hacker, J. & Hathaway, W. (1991, April) *Toward extended assessment: The big picture.* Paper presented at the annual conference of the American Educational Research Association, Chicago.

Hunt, P., Staub, D., Alwell, M., & Goetz, L. (1994). Achievement by all students within the context of cooperative learning groups. *JASH, 19 (4)*, 290-301.

Jenkins, J.R., Deno, S.L. & Mirkin, P.K. (1979. Measuring pupil progress toward the least restrictive environment. *Learning Disability Quarterly, 3*, 34-45.

Lidz, C. (1997). Dynamic assessment: Restructuring the role of school psychologists. National Association of School Psychologists, *Communiqué, 25 (8),* 22-24.

Meltzer, L. (1993). *Strategy assessment and instruction for students with learning disabilities.* Austin TX: Pro-ed.

Meltzer, L. & Reid, D. (1994). New directions in the assessment of students with special needs: The shift toward a constructivist perspective. *Journal of Special Education, 28(3),* 338-355.

Ministry of Education (1993a). *New Zealand Curriculum Framework.* Wellington: Learning Media.

Ministry of Education (1993b). *Technology in the New Zealand Curriculum.* Wellington: Learning Media.

Ministry of Education, (1996a). *Special Education 2000.* Wellington: Ministry of Education.

Ministry of Education (1996b). *TeWhariki Early Childhood Curriculum.* Wellington: Learning Media.

Mitchell, D. & Ryba, K. (1994). *Students with education support needs: Review of criteria for admission to special education facilities and for the allocation of discretionary resources.* Hamilton: University of Waikato, Department of Education Studies. (Final Report on Contract Research for Ministry of Education.)

Orelove, F. (1991). Educating all students: The future is now. Chapter 4 in L. Meyer, C. Peck & L. Brown (Eds.) , *Critical issues in the lives of people with severe disabilities.* London: P. H. Brookes.

Raven, J.C. (1960). *Guide to using the Standard Progressive Matrices.* London: Lewis.

Robinson, V. (1993*). Problem-based methodology: Research for the improvement of practice.* Oxford: Pergamon Press.

Ryba, K., & Brown, M. (1994). The teacher as researcher: Studying approaches to teaching and learning with information technology. *Computers in New Zealand Schools, 6(2),* 3-5.

Ryba, K. & Selby, L. (1995). Empowering students with computers. Chapter 7 in Fraser, D., Moltzen, R. and Ryba, K. (Eds.), *Learners with special needs in Aotearoa New Zealand.* Palmerston North: Dunmore.

Ryba, K., Selby, L., & Nolan, P. (1995). Computers empower students with special needs. *Educational Leadership, 53 (2),* 82-84.

Schleien, S, Meyer, L. Heyne, L., & Brandt, B. (1995). *Lifelong leisure skills and lifestyles for persons with developmental disabilities.* Baltimore: P. H. Brookes.

Swanson, H.L. (1989). Strategy instruction: Overview of principles and procedures for effective use. *Learning Disability Quarterly, 12 (1),* 3-14.

Swanson, H.L. (1996). *Swanson Cognitive Processing Test. Examiner's Manual.* Austin TX: Pro-ed.

Torgeson, J.K. (1978). The role of non-specific factors in task performance of learning disabled children: A theoretical assessment. *Journal of Learning Disabilities, 10*, 27-35.

Torgeson, J.K., & Licht, B. (1983). The learning disabled child as an inactive learner: Retrospects and prospects. In J. McKinney & L Feagans (Eds.*), Current topics in learning difficulties* (Vol. 1, pp. 3-31). Norwood NJ: Ablex.

Vygotsky, L. (1978). *Mind in society.* Cambridge MA: Harvard University Press.

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