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Mindful Classrooms: A Synthesis of Research on Multiple Intelligences Theory in Cross-Cultural Contexts

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Introduction

The scene is a primary school in regional Australia that has a large proportion of students from non-English-speaking backgrounds (NESB). In one of these culturally diverse classrooms, I observed the following exchange at the beginning of a blustery Thursday with the students gathered together on the front mat. The teacher was quizzing her Grade 1 class on the days of the week. She held up flashcards and the children were asked to read the day. When she held up 'Thursday', she drew attention to the 'ur' sound and asked which other day also included the 'ur' sound. After a few incorrect attempts from various class members, the answer of 'Saturday' was given. As the teacher resumed 'testing' the days of the week, James, a boy from Papua/New Guinea, said, "Turtle has the 'ur' sound, too." The teacher nodded at the child and continued with the days of the week when James again interrupted with, "And dinosaur. That ends with 'ur'." The teacher looked at him and with ill-humour, said, "Yes, but dinosaur doesn't make the 'ur' sound, does it?" before continuing with the lesson. What interpretations can be made of this exchange? We could assume that this is a teacher who does not welcome interruptions that take the class 'off-task' and this is certainly the explanation given after the lesson. In response, I commented to the teacher that James seemed to be a bright boy to which she replied, "James is <u>too</u> smart. He gets us off task all the time." However, on a number of other occasions, I observed the teacher capitalising on those 'off-task' teaching moments when another child was responsible for the interruption, particularly when the 'culprit' was a white girl.

<u>Cultural Diversity and School Achievement</u>

The dinosaur example is illustrative of many similar examples from my data, collected over a decade of research in Australian schools, which indicate the relative unresponsiveness of the teacher to children from different cultural backgrounds. It is a powerful illustration that indicates, at best, a failure to be mindful of the diverse needs of students from diverse cultural

groups, and, at worst, discrimination against such students. Further, the dinosaur example illustrates the importance of teachers interacting with students in ways that not only permit, but also encourage, student initiative. In the dinosaur example, James's initiative was actively discouraged because it did not coincide with the teacher's agenda. Further, while James possessed high linguistic intelligence, evident in his verbal exchanges, this ability was not always evident in written tasks and was therefore not fully appreciated. There is little chance for a teacher to establish intersubjectivity (Vygotsky, 1978)—that is, shared understanding—with children from culturally diverse groups unless the teacher values the ways of thinking and learning of all children and allows their diverse voices to be heard.

The dinosaur incident highlights why I believe Gardner's (1983) Multiple Intelligences (MI) theory is highly relevant for an education system that purports to develop the potential of all its culturally diverse students, and often fails to do so. The ideas reported in this chapter are motivated by the well-documented achievement gap between children from diverse cultural backgrounds and those from the mainstream culture (Au, 1998; Au & Mason, 1981, 1983; Ford, 2003; Howitt & Owusu-Bempah, 1994; Kozol, 1991, 1995; Mirza, 1992; Pallas, Natriello & McDill, 1989; Wellman, 1993; Wetherell & Potter, 1992). This gap has often been attributed to the cultural differences between white middle-class school structures and children of cultural minority groups or low socioeconomic status (Boutte & DeFlorimonte, 1998; Heath, 1983; Tharp & Gallimore, 1988). Part of this cultural mismatch may be the differing cultural background of the teacher compared to the children (Ladson-Billings, 2001; Pigott & Cowen, 2000). Scrimsher and Tudge (2003) argue that responding to children's diversity involves not only awareness of the children's backgrounds but also "the specific approaches to learning and communicating with others that children bring with them to school" (p. 303). This chapter argues that MI theory provides a tool for teachers that assists them in recognising, valuing and accommodating the diversity among their students.

Cultural Diversity and Giftedness

My interest in MI theory was initially stimulated by the under-representation of culturally diverse students in programs for the gifted, a situation that largely arises from the over-dependence on IQ-type testing in selection processes. The broader conceptualisation of intelligence inherent in MI theory offered promise for identifying giftedness in children who did not perform well on a standard IQ test. MI theory, then, is consistent with a shift to more inclusive and broadened notions of giftedness (Gallagher, 2003; Shore, Cornell, Robinson & Ward, 1991). My research has demonstrated that it is an effective framework for identifying giftedness in students from cultural minorities (Vialle, 1991; 1994b; 1995).

When I started circulating these ideas over a decade ago, I encountered a hostile reception from many people in gifted education. For some people in the field, MI theory was perceived as a threat to gifted education because it broadened the base of intelligence and relegated the IQ test to a less lofty status. Despite these critics, several practitioners in gifted education welcomed the theory and utilised it predominantly in the design of learning activities for gifted students.

My research and practical experience have convinced me that MI theory can speak to some of the debates that face gifted educators. Rather than undermine gifted education, MI theory offers the potential to reconceptualise the field in issues such as defining giftedness, identification procedures, and equity versus elitism, particularly as they relate to the under-representation of culturally diverse students in gifted programs. In contrast to IQ tests which offer a narrow, Western view of intelligence—that is, linguistic and logical-mathematical abilities—MI theory argues for a pluralistic view of intelligence that acknowledges the role of sociocultural influences on the individual. This broader conceptualisation is essential in cross-cultural settings where there are likely to be differences in the patterns of strengths across intelligences. For example, Kearins' (1976) research demonstrated the superior spatial

abilities of Australian Aboriginal children compared to children of European descent. Similar observations have been made of the superior spatial intelligence of Native American children (Ford, 2003; Maker, 1992). Consequently, we are more likely to recognise the intelligence of culturally diverse students when a pluralistic view of intelligence is applied.

In terms of defining giftedness, there is now a general acceptance in the literature of a broader conceptualisation of giftedness (Gallagher, 2003; Shore, et al, 1991). Gardner's theory, along with the work of Sternberg (2000) and Perkins (1995), has contributed to this shift in the literature. While the definitions of giftedness have embraced a broader range of domains, many educators view intelligence as one sub-set of giftedness, which they term ‘academic giftedness’. Hence, narrow definitions of intelligence continue to dominate practice, as the IQ test remains the primary form of identification for many gifted programs (Clark, 1990). For this reason, minority representation in gifted programs is disproportionately low and the development of culture-fair means for the identification of giftedness remains a pressing need. MI theory is a framework that argues for more authentic means of assessment and is consequently suited to the identification of children from diverse backgrounds who may not do well on IQ tests because of language differences. To illustrate this, Gardner's theory has been frequently cited as the basis for several Jacob K. Javits grants, a US program providing funds for research into giftedness in disadvantaged groups (see, for example, Baum, Owen & Oreck, 1996; Maker, Nielson & Rogers, 1994; Plucker, Callahan & Tomchin, 1996).

Gifted education is often accused of being elitist and it is clear that the under-representation of diverse cultural groups has provided some support for such conclusions. However, the cornerstone of gifted education is that provision for gifted students is more a matter of equity than elitism. Gifted education practitioners would argue, then, that what is at stake is an appropriate education that recognises and responds to the individual differences of

all students. MI theory is one tool that can assist in this process. In Australia, it has been a powerful tool for getting teachers who were opposed to gifted education to recognise the need to cater appropriately to the diverse students they teach.

MI theory is now twenty-one years old and it has been used as a framework for a highly diverse range of applications from preschools through to adult career development, as well as in special education settings, mainstream classrooms and in gifted programs. Despite such widespread practical application, however, the research base is still relatively small.

Review of Gardner's Theory

Re-thinking Intelligence

Gardner's diverse studies of normal and gifted students at Harvard's Project Zero, his work with brain-damaged patients at Boston Veterans Administration Medical Center and his involvement with the Project on Human Potential, led to the publication of *Frames of Mind* in 1983. In that original publication, Gardner defined intelligence as "the ability to solve problems, or to create products, that are valued within one or more cultural settings" (1983, p. x). The theory has generated a great deal of commentary in the twenty-one years since its publication and has been warmly embraced by educators.

One of the reasons for the success of MI theory among teachers is that it captures what good teachers have always tried to do—that is, to understand the complex array of abilities in each of their students and develop appropriate programs to nurture those abilities. What has been critical is that the theory honours the diverse ways in which people understand, know, learn, and express their views of the world. It has done so by acknowledging that intelligence is something that is not reified as an immutable thing but is culturally defined and enacted. In *Teaching through the Eight Intelligences* (Vialle & Perry, 2002), I made the following observations about how intelligence was re-constituted from an MI perspective:

- Intelligence is not a single trait as it has been so often conceptualised in the past. The current theories broaden the conception of intelligence, albeit in different ways. This is critical for appreciating the intellectual strengths of culturally diverse students.
- Intelligence is "teachable". Sternberg (1986), for example, has developed a program to teach intelligence called *Applied Intelligence* while Gardner has focused on the development of creativity in young children through Project Zero initiatives in a variety of educational settings (Krechevsky, 1991; Krechevsky & Gardner, 1990). The ideas of both Gardner and Sternberg have been combined in a program for teaching practical intelligence in the middle years within the school system (Gardner & Krechevsky, 1993).
- Intelligence is culture dependent. Each society—indeed, each cultural group within a society—determines what is intelligent and thus the conception of intelligence will vary over time and space. For example, the ability to locate food sources and navigate a harsh environment was a highly valued form of spatial intelligence in traditional Aboriginal communities. Today, the spatial intelligence of the visual artist is highly regarded.
- Intelligence involves both internal and external factors. The individual's intellectual potential is activated, enhanced or hindered by interaction with the environment.

(Vialle & Perry, 2002, p. 9)

The Eight Intelligences

Gardner's eight intelligences may be described as follows:

- *Linguistic* intelligence is the ability to use language to excite, please, convince, stimulate, or convey information;
- *Logical-mathematical* intelligence is the ability to explore patterns, categories, and relationships by manipulating objects or symbols, and to experiment in a controlled, orderly way;

- *Spatial* intelligence is the ability to perceive and mentally manipulate a form or object, and to perceive and create tension, balance, and composition in a visual or spatial display;
- *Musical* intelligence is the ability to enjoy, perform, or compose a musical piece;
- *Bodily-kinesthetic* intelligence is the ability to use fine and gross motor skills in sports, the performing arts, or arts and crafts production;
- *Intrapersonal* intelligence is the ability to gain access to and understand one's inner feelings, dreams, and ideas;
- *Interpersonal* intelligence is the ability to understand and get along with others; and,
- *Naturalist* intelligence is the ability to recognise and classify species in the natural environment. (Vialle & Perry, 2002, p. 9-10)

Gardner (1999) also considered the possibility of a ninth intelligence, existential intelligence, which incorporates notions of spirituality along with philosophical contemplation of the nature of existence. However, this candidate intelligence does not meet all his criteria and so he has dismissed it at this point. There is an extensive literature on spiritual intelligence emerging in different disciplines (see, for example, Sisk & Torrance, 2001; Suhor, 1999; Zohar & Marshall, 2000), nevertheless, that may resolve some of Gardner's concerns in the future.

It is important to note that Gardner viewed each of these intelligences as being relatively independent of each other. In other words, it is possible to have extremely high ability in one intelligence while the remainder of one's intelligences are below average—we might see such a pattern in an Autistic Savant such as Dustin Hoffman's film persona in *Rain Man.* While human beings are not all as extreme as this in their brain organisation, we all differ in the combination of strengths and weaknesses across the eight intelligences we

possess. In fact, it is precisely the combination of intellectual strengths and weaknesses that make us suited to the particular vocations and avocations that interest us.

The intelligences, then, are a hypothetical construct for how our brains are organised. Whenever we go to perform a task in our world, however, we use a combination of intelligences. Hence, the concert pianist will draw heavily on musical intelligence in performance but will also draw on her intrapersonal intelligence (to feel the emotion and nuances of the piece), her interpersonal intelligence (to communicate those nuances to an audience), her bodily-kinesthetic intelligence (in the fine motor dexterity needed to play the piano) and even her logical-mathematical intelligence (to make sure that she makes a living from it).

Implementation of MI in Schools

The Key School, Indianapolis.

In the decade following the publication of *Frames of Mind* (1983), Gardner's theory stimulated a plethora of publications, from his collaborators at Project Zero (located at Harvard University) and from educators throughout the US. One of the early pioneers was the Key School in Indianapolis, which adopted a whole-school approach to MI theory. Established in 1987, the principal, Pat Bolanos and her staff created an educational program based on their interpretation of MI (Bolanos, 1990). The student intake was deliberately selected by ballot to ensure that it reflected the racial diversity of Indianapolis, with 40% of the students being African-American. The school's curriculum utilised a school-wide thematic approach such as Connections or Animal Patterns or Changes in Time and Space over a nine-week cycle. The students undertook their regular subjects in intact classes and then re-grouped into interest pods for special activities related to the theme. Children also worked individually on an individual project on the theme that could be presented in any

form they desired. These presentations were videotaped and retained in the child's portfolio of achievements.

A feature of the Key School was the Flow room. Csikszentmihalyi (1990) described Flow as the state attained when a person applies intense, focused concentration on a task that results in high levels of satisfaction and enjoyment. In Key School's Flow room, students were invited to enjoy any of the wide-ranging games and puzzles available. A Flow-room teacher encouraged the students to reflect on the activities they selected, thereby emphasising the metacognitive aspects of the learning experience. Assessment and reporting at the Key School were designed to focus on the students' strengths because the teachers believed that this would enhance the students' intrinsic motivation and lead to more successful learning. The reporting forms were based on the different intelligences and included ratings for active or passive participation and intrinsic or extrinsic motivation.

Almost twenty years later, the school is still operating with its MI-based curriculum and its culturally diverse school population. Although formal evaluations of the school's program have not been conducted, the former principal reported that the school ranks well in the state's mandated standardised tests and action research projects conducted at the school reveal a strong link between their curriculum approach and enhanced intrinsic motivation in the students (Bolanos, 1994).

Whole-school approaches in Australia.

Following in the wake of the Key School, other MI schools, classrooms and projects were established in the United States (see, for example, Armstrong, 1994; Campbell, Campbell & Dickinson, 1992; Campbell, & Campbell, 1999; Chapman, 1993; Haggerty, 1995; New City School, 1996) and it is now being implemented in some form in most countries throughout the world. Some examples of whole-school approaches in Australia

include the Gardner's Patch Preschool in New South Wales, Cook Primary School in Canberra and Sacred Heart in Sydney’s Cabramatta.

The Gardner's Patch Preschool is located in a southern suburb of Wollongong and reflects the ethnic diversity of the city with 70% of the students’ families originating from southern Europe and the Middle East. The centre's director and teachers have worked together to provide an educational environment that is organised around learning centres based on the eight intelligences and named after Australian personalities such as Fred Hollows (Interpersonal Intelligence) and Pro Hart (Spatial Intelligence). When interviewed about their views on the effectiveness of the MI approach, the teachers at Gardner's Patch reported to me that it had provided them with a sound theoretical framework on which to base an Early Childhood program. They all expressed some initial reservations but as they became familiar with the changes in emphasis, they came to realise that they gained better insights into their culturally diverse children's abilities through the focused observations they conducted.

Cook Primary School is a small school in the suburbs of Canberra that was closed temporarily in 1990 because of declining enrolments. As a result of concerted community action, the school was reopened and Judy Perry was appointed its principal. While reestablishing the school, Perry heard an interview with Howard Gardner on the local radio and was sufficiently stimulated to read everything she could locate on MI theory. In mid-1991, she introduced the theory to her staff and parents at Cook School and proposed that it represented an effective framework for designing a quality curriculum at the school and one that would allow all children to reach their potential. The school’s population has a mix of cultural backgrounds resulting largely from the various embassies and consulates located in Canberra.

By 1993, all the teachers in the school felt that they had assimilated MI into their regular teaching practices and were positive about the model it had provided for them to offer quality teaching and learning programs. They made the shift from being teacher-focused in their planning to a more student-centred approach where they try to cater for the varying interests and talents of their students. In 1994, I interviewed all the teachers individually and they confirmed that it had become natural for them to teach both to and through the intelligences and to recognise different intelligences in the students. One teacher commented: “It's good for seeing children's strengths in different areas. The enthusiasm is higher. It reaches the kids.”

In 2000, Cook Primary School produced a videotape designed to showcase the MI approach it has adopted. In the video, staff, students and parents talk enthusiastically about the difference Cook School's approach has made in their lives. Chief among these comments is the emphasis placed on the opportunities students have to learn in a variety of ways. The premise of the school is that students need to learn how to learn, how to learn in diverse ways, and how to honour and value the different ways of knowing, thinking and learning evident in different cultures. The community of Cook Primary School believes that MI is a framework that allows them to accomplish these aims.

By contrast to Cook Primary School, Sacred Heart is a large Catholic primary school in Cabramatta, one of the densely populated western suburbs of Sydney. The vast majority of the students who attend the school are from a low socioeconomic background and over 95% are from a non-English-speaking background, predominantly Asian. In the mid-nineties, the principal, Shirley Jackson, introduced MI theory to her staff and suggested that this provided the key to recognise and nurture the abilities of their diverse group of students. Jackson reported to me that the MI approach has been an outstanding success at the school, particularly in terms of the children's academic achievements. She stated that the secondary

schools, to which the students progress, had commented favourably on the academic levels and the independence and initiative of the students coming from Sacred Heart (personal communication, 1996).

Project Spectrum.

At the end of the 1980s, Gardner's collaborators at Harvard's Project Zero conducted research through Project Spectrum that sought to test MI theory in an early childhood setting. The researchers devised a number of activities within each of the intelligences and then implemented these with children in a number of preschools. The participating children were observed solving problems and creating products across the intelligences over the course of a year. These observations and assessments formed the basis for a Spectrum report, which indicated each child's individual profile of strengths and weaknesses across the intelligences. This research project demonstrated that children from an early age possessed distinctive intellectual profiles. Further, the study indicated that there was no correlation among the intelligences (Krechevsky, 1991; Krechevsky & Gardner, 1990). Similar findings were evident when the Spectrum approach was replicated in Florida in the Prism study, which focused on children from diverse cultural backgrounds (Vialle, 1993a).

While there are numerous publications on the implementation of MI theory, the majority of these are descriptions of programs from the lesson level to the school organisational level, outlines of teaching strategies, or descriptions of assessment procedures. The articles rest on testimonials of participants rather than engaging in systematic research or evaluation. This is epitomised in the September 1997 (Volume 55, Number 1) issue of the Association for Supervision and Curriculum Development's publication, *Educational Leadership,* in which the majority of articles relate to practical applications of the theory.

MI in Cross-cultural Contexts

As indicated previously, MI theory seemed to offer a viable alternative to recognise and nurture the abilities of culturally diverse students. In the remainder of this chapter, I would like to focus on two programs of research and practice that demonstrate the contribution that MI theory can make to the education of culturally diverse students. The first of these is my own research into MI which is now in its second decade; the second program is the DISCOVER Project, an international program directed by my US colleague, June Maker.

Tuesday's Children: A Study of African-American Preschoolers

The research approach.

My PhD research used MI theory as a framework through which to observe preschoolers from low socio-economic backgrounds. The study was conceptualised as a means of identifying the abilities of children whose minority status mitigates against their being identified as gifted when conventional IQ tests are used. My dissertation, *Tuesday's Children: A Study of Five Children Using Multiple Intelligences Theory as a Framework* (Vialle, 1991), describes the intellectual profiles of five African-American children, aged from three to five years.

In order to investigate the utility of MI theory as a lens through which to assess the abilities of preschoolers, a two-phase study was undertaken. In the first phase, 60 children in five diverse early childhood settings were selected. Intellectual profiles, based on the children's interactions with activities modelled on the work of Project Spectrum (Krechevsky, 1991), were constructed. From these 60 children, five children were selected for more intensive case studies. In selecting the children, I aimed to maximise the differences among the children—that is, the children seemed to possess different patterns of intellectual strengths and weaknesses; some children were viewed positively by their day-care providers

while others were regarded negatively; their home environments varied in the degree of supportiveness as perceived by the day-care providers; and one child appeared to have a flat profile (that is, absence of particular strengths or weaknesses). The five children were observed intensively over the period of a year by the researcher who operated as a participant observer. Observations were conducted at the day-care facility, the home and other community settings (for example, church, cinema, zoo, and so on). Additionally, ongoing semi-structured interviews were conducted with the day-care providers, the family care-givers, and the children. Artefacts in the form of drawings and stories (tape-recorded) were also collected and analysed.

High spatial intelligence: the case of Thomas.

The findings of the original PhD research have been published more fully elsewhere (Vialle, 1991; 1993a; 1993b; 1994a; 1994b; 1995). In brief, the case studies confirmed the utility of Gardner's framework for children whose profiles do not stand out in the traditionally-valued linguistic and logical-mathematical intelligences to be found in IQ tests. The case of Thomas, an African-American preschooler, illustrates this point.

Thomas was aged four when I first met him. His day-care providers described him as a child who would inevitably end up in an emotionally disturbed classroom because of his unruly behaviour. I was told he could not concentrate, did not know his geometric shapes and that he was practically non-verbal. I noted in my early observations that he was a loner who rarely interacted with the other children or the teachers in the day-care setting. I was surprised, therefore, when he chose to work with me one day when I had brought in a Peg-a-train (wooden train that dismantled into about 10 pieces). He sat down and before I could give him my well-rehearsed instructions for the activity, he had completely dismantled and reassembled the train without a single false start. I was impressed because I had had a lot more difficulty

with the task myself. In my researcher zeal, I was excited to 'discover' Thomas's competence in this spatial intelligence task and I resolved to closely observe his art work. Once again, I was impressed with his eye for detail and focused attention.

On another occasion, Thomas, who had been described as having poor concentration skills, sat with me for 40 minutes while he tackled a complex assembly task. Forty minutes from a four-year-old cannot be labelled as poor concentration. I also noted that this 'non-verbal' child spoke at great length while constructing and drawing. One example I noted as he drew was: "The cat was coming out of the rainbow and saw the monster looking at him." Again, this hardly qualifies as the utterance of a non-verbal child.

Thomas had a fascination with patterns and would often trace out patterns on my clothing as if he were trying to commit them to memory; he would also accurately name all the geometric shapes as he encountered them. However, he rarely demonstrated these skills when called upon to do so. Nevertheless, it is important to note the impact that my positive interactions with him over the course of the year seemed to have on Thomas. His violent outbursts, while not disappearing completely, diminished significantly from a twice-daily average to rare occasions.

Thomas is an important example of a child whose progress through school is likely to be marked by preoccupation with his deficits rather than acknowledgement of his strengths. Yet, my study indicated that when his strengths were acknowledged and used as the starting-point, he was able to develop his skills in weaker domains. His language skills, for example, improved dramatically over the course of the study and his confidence was also enhanced.

The key to unlocking Thomas's potential lay in recognising his superior spatial intelligence, an intelligence that is more highly valued by indigenous cultures (Kearins,

1976; Maker, 1992) and African-Americans (Ford, 2003). The implications for the design of school curricula are clear. Educators need to be aware of the salience of different intelligences for different cultural groups and ensure that time is provided for students to develop these intelligences. The salience of spatial intelligence for indigenous and African-American cultures is the likely explanation for the success of school programs that emphasise visual arts, such as the Key School in Indianapolis and the DISCOVER programs described later in this chapter.

Lessons learned: challenging the stereotypes.

In 1994, I conducted the first of a series of follow-up studies on the children in my PhD research. Thomas had just completed Grade 1 and I interviewed his class teacher about his development. The teacher reported that she had been surprised by his performance on the recently-completed basic skills tests because his marks were quite high and close to the top marks in the class. She was surprised because she had placed him in the 'bottom' ability groups during the year. She explained to me that "His attitude will always do him down. He has a giant chip on his shoulder and doesn't get along with anybody." I was dismayed to learn that this white teacher had failed to recognise the abilities of Thomas because of his under-developed interpersonal skills. I am not convinced that she would have made the same judgement if Thomas had been white.

Their teachers regarded Thomas and other children in the study as intellectually deficient and yet they possessed outstanding abilities in other intelligences. The assessments that permitted these abilities to be discerned were dynamic in nature: they allowed children to become familiar with the materials; they allowed for the researcher to scaffold their solutions to problems; and they allowed performance across the full range of intelligences rather than filtering all tasks through the child's linguistic competence. Further, the dynamic assessment

approach demanded that the teachers develop their observational skills along with a willingness to probe children's solutions.

Dynamic assessment is a concept emanating from the theories of Vygotsky (1978), particularly his concept of the Zone of Proximal Development (ZPD). Based on the belief that children learn best when they are operating beyond the level they can achieve alone through the guidance of a more expert person, Feuerstein, Rand, Hoffman and Miller (1980) elaborated the principles of dynamic assessment. In the classroom context, dynamic assessment allows educators to shift the emphasis away from the measurement of current performance that may be depressed for a variety of reasons and therefore not accurately reflect the learning capacity of the child. Instead, dynamic assessment focuses on the process of change and, particularly, the joint construction of knowledge and skill in the process of collaboration with an adult or more capable peer (Kirschenbaum, 1998; Roth, 1992). For example, in my research I used a garden sprayer as an Assembly Task; as the children attempted to take the object apart and reassemble the pieces, I assisted them with verbal prompts such as, "Which piece needs to go on top?" or "Where do you think this tube needs to go?" or non-verbal cues such as passing them the required piece. Further, children would undertake the same activity over the course of the study and improvements in their performance were noted.

What is vital is that teachers adopt an attitude of seeking students' strengths rather than assuming a deficit. Teachers who maintain a narrow perception of intelligence and development will continue to regard children outside the norm as deficient, thereby affecting the quality of their interactions with those students. Conversely, teachers who recognise individual differences are more likely to nurture each child's intellectual development. This is particularly important for children from cultural minorities because their blend of intelligences may not be as evident as those from the mainstream.

MI in Culturally Diverse Australian Classrooms

From 1993, I conducted similar research to my PhD research but located in kindergarten and Year 1 classrooms in Australian schools with high proportions of children from non-English-speaking backgrounds (NESB). Data were initially collected over a two-year period and involved classroom observations, interviews and collection of artefacts. Despite the differences between the research samples, the results from this initial Australian study were similar to the findings of my original research study. The following observation of Samuel, a Chinese boy, is illustrative.

The NESB learner: the case of Samuel.

In mid-May, 1994, I observed Samuel, a recent Chinese immigrant, immersed in a rich linguistic environment as he interacted with the teacher, the Kindergarten aides and other children. He demonstrated his understanding of the teacher's instructions as he immediately and accurately completed the tasks required. He also worked cooperatively with other children in the culturally diverse classroom. In all these interactions, Samuel spoke only when directly asked a question but he listened to a wide variety of language types (instructions from the teacher; descriptions of the children's drawing activities; co-operative sharing of puzzle completion; and so on). Samuel was then withdrawn with seven other children for ESL (English as a Second Language) instruction. The ESL teacher was midway through a reconstruction of *Hattie and the Fox* with the group. Each child had a collection of stencilled sheets in which the labels of parts of the body had been removed for the children to complete; the final sheet was given to the children in this lesson. As soon as he received the sheet, Samuel reached for a pencil and started to fill in the missing words until he was instructed to “Wait for the other children.” The teacher directed the entire session with minimal linguistic instructions: “What part is next?”; “Watch the board”; and, “Colour the

fox." All the children in the group had to simultaneously name the part of the fox's body, watch the teacher write the word on the board and then copy it onto their sheets. In this situation, Samuel was completing tasks well below his capability at a pace that was far too slow for him. Throughout the entire session, Samuel was not required to speak a single word nor was he immersed in a rich linguistic environment—and yet it was his oral language abilities that concerned his Kindergarten teacher. This example demonstrates the mismatch that can occur between an NESB child's intellectual needs and the compensatory language program that he or she is given. The problem is exacerbated when the ESL teacher has not been adequately trained to fulfil the demanding role required of them.

My observations had revealed that Samuel, like many Asian children, had outstanding strength in logical-mathematical intelligence. Given the teachers' desires to develop his oral English skills, an alternative approach would be to link his logical-mathematical skills to the desired outcome. For example, mathematical problems could be presented as story-problems and Samuel could be encouraged to conduct small research projects (eg the number and types of pets owned by the class members) and report the findings verbally.

<u>The teacher's role in developing the intelligences of culturally diverse students.</u>

Since 1994, I have continued to work with teachers, schools and education systems to implement MI as a key element in the design and delivery of educational programs. This ongoing evaluation and research have clearly demonstrated the need for teachers to be sensitive to the cultural and ethnic diversity of their students. The predominance of White middle-class norms in schools continues to constrain the educational opportunities of children from certain ethnic groups and social classes. In a multicultural society, we can no longer cling to stereotypical attitudes and neglect our responsibilities to promote the opportunities for all students to develop their intelligences, regardless of their cultural background.

Further, the conclusions of the various research projects I conducted underscore the need for teachers to cease using Standard English usage as a de facto measure of intelligence. The analysis of classroom interaction in the Australian classroom research demonstrated a clear mismatch between teachers' stated beliefs regarding intelligence and their classroom behaviours. For example, teachers readily described a wide range of abilities when interviewed about their views of intelligence but within the classroom, these teachers responded to children according to their use of Standard English. As a result, culturally diverse children were less likely to have their abilities recognised because they did not demonstrate high levels of competence in Standard English. Ironically, the data demonstrated that NESB children were given a less rich linguistic environment, less cognitively challenging activities, and less opportunities for verbal interaction than their English-speaking-background peers. When assessing the linguistic competence of NESB children, we should pay more attention to their facility in their first language than in Standard English. This will give us a much more accurate view of the child's abilities.

There are three key themes that emerged from the MI research I have conducted. The first relates to the importance of distinguishing among intelligence, domain and field; the second relates to the importance of dynamic assessment in understanding and extending intelligence; and the third relates to mediation.

Intelligence, domain and field.

My research has demonstrated the need to make a distinction among the concepts of intelligence, domain and field. Without making such a distinction, it is possible to confuse intelligence and domain, and this confusion prevents us from understanding how the intelligences work together. From the MI perspective, intelligence is a psychological construct that hypothesises how human intelligence has evolved and how it is organised. Each intelligence is discrete and enables us to deal with various aspects of our world. Clearly,

there is a significant genetic component in these intelligences. A domain is a cultural invention and represents a collection of human endeavours; examples include quantum physics, detective fiction and impressionist painting. While an intelligence is discrete, activities within a domain draw on a combination of intelligences; it is therefore the pattern of intelligences that is important in determining our preferred vocations and avocations. The field represents those people who make up a domain. In the context of children (and many adults), parents, teachers and peers provide feedback that shapes the way those children view their abilities.

This distinction among intelligence, domain and field is at the heart of understanding the different emphases that cultural groups place on the intelligences, as well as the different ways in which intelligence may be enacted in different cultures. As indicated previously, Thomas possessed high spatial intelligence, an ability that is valued in his cultural group. Another of my African-American case study children, Kayla, demonstrated high levels of musical and bodily-kinesthetic intelligence. When she commenced school, she struggled to learn to read and write, despite the fact that she had a love of story. She would spend hours at home creating elaborate stories, punctuated with her own songs and dance but at school could not focus on the flashcards her teacher used. Again, musical and bodily-kinesthetic intelligences are valued in Kayla's culture and rather than dismissing their value in the classroom, teachers need to recognise their contribution to the motivation and learning of such students. This means not only providing students with opportunities to develop their musical or bodily-kinesthetic intelligences but also to allow students to demonstrate their understanding of topics through multiple intelligences; in cultural contexts where these intelligences are valued, teachers may also consider introducing new concepts or topics through music or dance.

Dynamic assessment as an alternative to IQ testing.

In my work with children and adults, I have realised that IQ assessments do not adequately reflect the breadth of human abilities. This is especially pertinent for cultural minority groups whose dominant intelligences may not fit the Western view of intelligence. What has been important in understanding intelligence in the context of my research studies has been to move away from the snapshot approach of single-instance testing to a dynamic process in which assessors and those being assessed work together over time to develop their intellectual profiles. Through the adoption of this dynamic assessment approach, I discovered that I gained insights into how children learned from interventions and what degree of scaffolding was needed for individual children. These insights were far more important from an educational perspective than the results of any test that may have been utilised.

In the context of culturally diverse classrooms, teachers are more likely to develop the abilities of all their students if they adopt a dynamic approach that is mindful of the different ways in which intelligence may be expressed and understood in different cultural groups. For example, the verbal prompts that teachers provide to scaffold children's learning will be more effective if linked to aspects of the children's culture.

For some cultural groups, particularly indigenous cultures, interpersonal intelligence is highly valued and this also needs to be given attention in classroom organisation. For such children, a dynamic assessment approach would mean that their development is assessed within group activities as well as individually. In one of my studies, I observed Paul, a boy from Samoa, who struggled with the majority of classroom tasks and was regularly absent from school. On one occasion, I was working with his class on an MI project, introducing the students to each of the intelligences and asking them to reflect on their own strengths and weaknesses. Paul analysed himself as being weak at everything. I then asked the class to work in groups to design a theme park that would cater for all the intelligences, which they would need to present to the rest of the class. In this activity, Paul's outstanding interpersonal

intelligence came to the fore as he organised all the other groups in the class, co-ordinated their efforts, negotiated with the students, and confidently presented the final proposal. The skills he displayed in this activity would not have been evident if he had been given an individual task to complete. While group work is valuable for the learning of all students, it is essential for students whose cultures place high value on the interpersonal.

Mediation of children's learning.

Finally, the importance of mediation was a key element in my research. For example, I observed the preschoolers but also interacted with them, often enabling them to accomplish tasks they were unable to complete alone. Further, my original PhD research demonstrated that I became a significant person in the children's lives, perhaps illustrated by my being included in a drawing by one child of his family. The rapport that developed between the researcher and the children led to my doctoral supervisor quipping that the key outcome of the study was that "Every child needs a Wilma." Again, while this holds true for all students, it is particularly important in contexts where the teacher and the students do not share the same cultural group.

From a Vygotskian perspective, mediation is at the heart of children's learning, particularly the mastery of higher mental processes (Wertsch, 1985). According to Vygotsky (1978), the most important part of children's psychological development is acquisition of the culture to which they belong and this only occurs through interaction with others. The role of teachers is to create contexts in which children gain mastery over the cultural tools and the key means by which they do this is through mediation. Central to the concept of mediation is intersubjectivity, which is described by Wertsch (1985, 1998) as the establishment of shared understandings between the child and the adult (see also Dixon-Krauss, 1996). Intersubjectivity is an essential step in the process of internalisation as the adult gradually removes scaffolding and transfers responsibility to the child (Diaz, Neal & Amaya-Williams,

1990). Wertsch (1985) argued that language was highly influential in establishing child-adult intersubjectivity. Drawing on these ideas, unless teachers attain shared understanding with their culturally diverse students, their attempts to mediate instruction for such children may not be successful.

DISCOVER: A Framework for Honouring Diversity

Re-thinking assessment.

Professor June Maker at the University of Arizona, like myself, was concerned by the under-representation of cultural minority children in programs for the gifted (Maker, 1996). From the early 1990s, she has conducted extensive research on projects that combined MI with various problem-solving approaches. Her initial research in this area involved the development of an assessment process that she called DISCOVER (Maker, 1992, 1993, 1994). Like Project Spectrum and the Prism study, the DISCOVER approach involves the use of culturally-appropriate activities including toys and puzzles, such as Tangrams. Maker's approach, however, also incorporates a problem-solving continuum so that the tasks children complete range from simple tasks requiring convergent thinking skills to more complex and open-ended tasks that require divergent thinking skills. Trained observers meticulously record the children's problem-solving skills and behaviours across the intelligences and these observations form the basis for a Strength Profile for each child to guide curriculum development and educational choices.

The creation of the DISCOVER Assessment approach was founded on extensive research focusing on Multiple Intelligences, problem-solving and creativity, and cultural diversity. Drawing on the salience of different intelligences for different cultures, the approach has five components: Spatial Artistic tasks such as Pablo (large coloured cardboard pieces) require the child to create particular items such as an animal as well as a free-choice

item; Spatial Analytical tasks such as Tangrams require the child to create increasingly complex geometric figures using puzzle pieces; the Oral Linguistic task involves the child in selecting items from a toy bag and then telling a story about them in their first language; the Logical-Mathematical task is a worksheet with questions such as "Write as many problems as possible that have 10 as the answer"; and, the Linguistic writing task asks children to write whatever they choose (Maker, Nielson & Rogers, 1994). The precise tasks may be modified to suit the cultural groups for which they are used.

Key features of the approach are that it is:

- Non-biased in its construction and therefore applicable in diverse ethnic, cultural, and linguistic groups;
- Performance-based rather than filtered through language, thereby allowing children to engage in broad-ranging assessments across intelligences;
- Intelligence-fair, which means that children are assessed in the intelligence itself rather than through language, for example;
- Criterion-referenced which allows observers to note the children's performance against specific problem-solving behaviours rather than ranking them against other children;
- Standardised in its implementation but also allowing flexibility for specific cultural contexts; and,
- Future oriented in its focus on the problem-solving skills needed for success in school and beyond.

Issues of validity and reliability.

As indicated, the DISCOVER Assessment approach was initially based on extensive research. It has continued to develop and evolve over the last decade, supported by grants from the Office of Bilingual Education and Minority Languages Affairs and the Javits Gifted and Talented Education Program. During that development time, the approach has been used

extensively with cross-cultural groups throughout the world. This has included African-American, Anglo-American, Navajo, Tohono O'Odham and Mexican American groups in the US (Maker et al, 1994), as well as different cultural groups in the Middle East, Europe and Asia. Research studies have consistently demonstrated that the DISCOVER approach is effective in identifying the abilities of these culturally diverse students (Maker, 1997; Maker et al, 1994; Nielson, 1994; Sarouphim, 1999a, 1999b, 2000).

Maker and her colleagues have also researched the Assessment approach itself, particularly examining its reliability and validity (Griffiths, 1997; Maker, 1997; Sarouphim, 1999a, 1999b, 2000). Studies of the Assessment approach's reliability (Maker, 1997) revealed high levels of inter-rater reliability (85-100%) in those who were experienced observers compared to lower ratings for observers who were less experienced. Maker (1997) concluded that observers needed to be appropriately trained to conduct the observations reliably.

Research on the theoretical validity of the DISCOVER Assessment approach revealed that, in line with Maker's belief that giftedness is distributed equally across all groups in society, the approach identified high ability students in numbers that reflected the overall percentages of the students in the general school population (Nielson, 1994; Maker, 1997; Sarouphim, 1999a, 1999b, 2000). This is particularly pertinent for cultural minorities who are under-represented when more traditional assessments are implemented. The DISCOVER approach, for example, has been demonstrated to be particularly effective for Navajo and Mexican-American populations in south-west US (Griffiths, 1997; Maker, 1995; Maker, Neilson & Rogers, 1994; Maker, Rogers, Neilson & Bauerle, 1996; Sarouphim, 2000).

<u>From assessment to curriculum.</u>

The principles of the DISCOVER Assessment approach were utilised in the development of a curriculum model (Maker, Neilson & Rogers, 1994; Maker, Rogers,

Neilson & Bauerle, 1996) that has been implemented in the US as well as in Saudi Arabia, Egypt, France, England, Thailand, China, Hong Kong and Taiwan (Maker, 2004). Based on a constructivist approach, the model includes the following components:

- Active, hands-on learning;
- Integration of culture and language, which may involve bilingualism or using aspects of the child's culture in concept learning;
- Group work and provision of choice;
- Learning centres with MI materials such as musical instruments and art materials;
- Interdisciplinary themes;
- Problem-solving tasks that range from closed-ended to open-ended;
- Visual and performing arts;
- Self-selected assessment formats; and,
- Technology integration.

Maker and her colleagues have researched the effectiveness of the DISCOVER Curriculum Model in elementary schools in the US. Based in four elementary schools over a three-year period, the method undertaken was to train all teachers in the DISCOVER approach and then subsequently to observe all the teachers in their classrooms. Teachers were rated as either high implementers or low implementers depending on the congruence of their teaching approaches with the DISCOVER approach. Research in the four schools revealed that students who spent all three years in classrooms with high implementer teachers showed significant improvements on mandated standardised tests (for example, the Kentucky Instructional Results Information System and the Commonwealth Accountability Testing and System) compared to those students in classrooms with low implementer teachers (Maker, 2004; Maker, Rogers, Neilson & Bauerle, 1996). What is significant in this research is that

the schools were selected because of the high percentages of culturally diverse students, particularly African-Americans, Hispanics and Native Americans, who do not normally perform as well on these standardised instruments.

Another project involving high proportions of Native American and Hispanic students at Pueblo Gardens Elementary School in Arizona revealed that students showed a significant increase in Stanford 9 Achievement Test scores over a four-year period (from the 20th percentile to the 60th percentile). These remarkable gains have been attributed by the principal to their curriculum which has included the DISCOVER approach along with an arts program entitled ArtsBuild, a program that also draws on MI theory (Maker, 2004, personal communication). ArtsBuild involves devoting significant curriculum time to large-scale artistic projects facilitated by specialist visual and performing arts teachers and volunteers. The arts projects emphasise community building and language arts and are based on social studies and science themes. For example, one project involved the creation of a mural at the Tucson Hispanic Chamber of Commerce entitled “Our Community is Cool”.

Maker (2004) has emphasised that the DISCOVER Curriculum Model’s arts integration is a key to its success, particularly with culturally diverse students. This research has been confirmed by other studies, drawing on DISCOVER principles, that have found significant transfer effects from arts-based curricula to other academic areas. For example, the New York-based Arts Connection project reported that more than half the students in their study increased their achievement scores in reading, while at the same time the school and school district scores decreased (Baum, Owen & Oreck, 1996) and this was particularly marked for the cultural minority students (Baum, Owen & Oreck, 1997).

Maker’s DISCOVER Assessment and Curriculum Model is the most comprehensive application of MI theory of which I am aware. Further, the practical implementation has been

accompanied by rigorous research that confirms the value of MI in the design and delivery of curricula for widely diverse school populations.

Implications of our MI Research

Theoretical Implications

The research reported in this chapter has implications for theory related to diverse approaches to teaching and learning, particularly those that argue for a sociocultural approach to defining intelligence and learning potential. Our research has confirmed the importance of culture in conceptualisations of children's abilities, and the subsequent educational approaches that best meet the needs of such students. We have also demonstrated that the social context in which teacher and learner are engaged collaboratively in the design and delivery of educational programs is vital to the educational success of students from diverse cultural groups.

More specifically, our work has strengthened the key premises of Gardner's MI theory, particularly in confirming the relative independence of the intelligences. Future developments that may arise from our research are likely to impact on the organisation of the intelligences within the theoretical framework. For example, I am currently researching the developmental trajectory of spiritual intelligence, an intelligence that is particularly pertinent for indigenous cultures, and Maker (2004, personal communication) is working on delineating subsets of spatial intelligence, particularly artistic expression.

Implications for Practice

In this chapter, I have highlighted cultural minority children with high ability levels who probably would not perform well on an IQ test with its focus on Western forms of linguistic and logical-mathematical intelligences. Thomas had high spatial intelligence; Kayla

excelled in musical and bodily-kinesthetic intelligences; and, Paul had highly developed interpersonal intelligence. James had high linguistic intelligence but this was more evident in the oral sphere than the written; and, Samuel had high logical-mathematical intelligence and reasonable linguistic intelligence that was masked by his quiet classroom demeanour. Classrooms are cross-cultural environments that pose challenges and opportunities to teachers. The challenge is to understand and cater for the cultural diversity in the classroom while the opportunity lies in the enrichment to be gained for all students from valuing and learning from the intellectual strengths of those diverse cultures.

The biggest impact of our research to date, then, is in its implications for practice, particularly in relation to the assessment of giftedness in culturally diverse groups and in the development of appropriate curricula for those students. Our studies demonstrate that the value of MI lies more in its impact on teacher attitude than in quantifiable learning outcomes, although, as reported, Maker has data that demonstrate such academic gains. It is the contention of this chapter that culturally diverse children such as James, Thomas, Kayla, Paul and Samuel would have their abilities more readily acknowledged and nurtured if teachers adopt a pluralistic view of intelligence such as that proposed by MI theory.

MI theory itself speaks little to how classrooms should be organised but our work emphasises the following principles:

- A valuing of diverse ways of thinking and learning;
- A student-centred curriculum;
- Dynamic forms of assessment;
- Collaborative partnerships among students, teachers, parents and community; and,
- Inquiry-based projects.

Future Research Agendas

Our research has demonstrated that MI theory is an effective tool in helping shift teachers' views on the nature of intelligence and the individual differences among the students they teach. As a result, teachers are more likely to rethink their curricula to respond to individuals' needs. As one teacher in my research commented, "It makes me aware of what I'm doing. It makes me a better teacher and my students better learners. It's just a different way of thinking about teaching and learning." However, MI is not an educational end in itself and needs to be combined with other complementary approaches to curricula such as Maker's (1994) problem-solving continuum or an arts-based focus (Baum, Owen & Oreck, 1996). Future research needs to focus on more rigorously evaluating the various curricula approaches being conducted throughout the world to complement the largely anecdotally-based reports that dominate the MI literature.

Recently, I received an email from one of the students in my original research. His name is Andrew and he has just graduated from high school. As a 4-year old, he had impressed me with his meticulous drawings of cartoon characters. In my conversations with Andrew and his family over the last thirteen years, I have been surprised to see that the intellectual profile of Andrew I constructed in 1991 is still reasonably accurate despite the intervening years of education and experience. Most notably, Andrew's burning ambition is to become a cartoonist. This is surprising to me because I would have hypothesised that the intelligences are more open to change over time. It would seem that some longitudinal studies are needed to investigate the mutability of intelligence and the relationships among the intelligences. This research needs to adopt a multidisciplinary approach drawing on neurology, psychology and sociology to give us a more complete view of this complex construct we know as human ability.

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